Mayor Sue Digre called the meeting to order on September 12, 2016 at 7:00 PM

6:00 PM CLOSED SESSION

PURSUANT TO GOVERNMENT CODE SECTION 54956.8 Conference with Real Property Negotiators. Property: 2212 Beach Blvd., Pacifica, CA Agency Negotiators: Lorie Tinfow, City Manager; Michelle Marchetta Kenyon, City Attorney; Anne Stedler, Economic Development Manager. Negotiating Parties: City of Pacifica; Friend Development Group, LLC; StonePark Capital; The Peebles Corporation; and A.F. Canta. Under Negotiations: Instruction Concerning Price and Terms of Payment for Sale of Property.

7:00 PM OPEN SESSION

Call to Order

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<tr>
<th>Attendee Name</th>
<th>Title</th>
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<tbody>
<tr>
<td>Sue Digre</td>
<td>Mayor</td>
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<td>Mike O'Neill</td>
<td>Mayor Pro Tem</td>
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<td>Karen Ervin</td>
<td>Councilmember</td>
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<td>Mary Ann Nihart</td>
<td>Councilmember</td>
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<td>John Keener</td>
<td>Councilmember</td>
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Staff Present: Lorie Tinfow, City Manager; Michelle Kenyon, City Attorney, Van Ocampo, Public Works Director; Tina Wehrmeister, Planning Director; Dan Steidle, Police Chief; Rich Johnson, Deputy Fire Chief; Anne Stedler, Economic Development Manager; Mike Perez, Parks, Beaches & Recreation Director; Lorenzo Hines, Assistant City Manager; Ed Vandehey, MIS Manager; Joe Spanheimer, Police Captain; Kathy O’Connell, City Clerk.

Mayor Digre asked for a moment of silence for the victims of 9/11 following the salute to the flag by Mayor pro Tem O’Neill.

Salute to the Flag led by Mayor Pro Tem O’Neill

Closed Session Report

City Attorney Michelle Kenyon state there was no reportable action.
SPECIAL PRESENTATIONS

Proclamation - International Peace Day

Mayor Digre read a proclamation for an International Peace Day.

Delia McGrath, member of Pacifica Peace People since 2003, stated that it was a pleasure and honor to receive this proclamation from the city. She introduced Carolyn Jaramillo who will give their response.

Carolyn Jaramillo stated that she was speaking on behalf of the Pacifica Peace People. She stated that they thanked the City for issuing the proclamation declaring September 21 International Peace Day. She thanked City Manager Tinfow for reaching out to them to cooperate on a peace project, including taking the time to meet and plan it. She felt that, by issuing the proclamation, they have taken a public step in peace building, affirming their effort to create a culture of peace and organize community to expand the day of peace to a week for peace, encouraging various groups to create activities and lessons to focus on the need and desire for peace. She invited everyone to continue the effort by participating in the events, mentioning the Peace Vigil on International Peace Day will be at 7:00 on Linda Mar Beach. She encouraged the public to join them. She mentions the positive responses received while organizing the event, which furthered efforts to ensure that no one is hungry or homeless and rights respected. She felt that they can make that a reality by working together, mentioning the words used by farmworkers, see, say, it can be done. We have the power. She then invited the public to several other events.

Mayor Digre asked if they have examples of their art work.

Ms. McGrath stated that they do, putting posters in various places, including piece doves made by the children at the Art Center.

Mayor Digre asked if they want residents to participate.

Ms. Jaramillo stated that she had issued that invitation, starting with the poetry reading at Florey’s on the 17th in addition to the candlelight vigil on the 21st, International Peace Day.

Mayor Digre invited the group up to accept the proclamation and have a picture taken.

Ms. Jaramillo stated that they do an ad in the Tribune for International Peace Day, stating that they have 500 signers so far this year, and she asked that people go to pacificapeacepeople.net to download a copy of the ad and let them know they would like to sign it.

Proclamations - 2016 Olympians Danny Barrett and Ryan Patterson

Mayor Digre stated that they will make sure that Horace gets it in the paper. She then read the proclamation for Ryan Patterson. She then invited him to make a statement.

Ryan Patterson stated that he didn’t have the background of gymnastics history, but he stated that it was a crazy sport and you have to be ready for anything, competing in all six events. He commented that, while as a kid you say you would like to go to the Olympics, you don’t think about it actually happening. He stated that in 2009 or 2010, his coach told him he had the “road” for him to follow to go to the Olympics, hopefully by 2016. He stated that he let his
coach do all the planning and he focused on his gymnastics, mentioning the aspects of the road he followed.

Mayor Digre said that it was great that he kept up his studies.

Mr. Patterson stated that his mother would not let him give up studies.

Mayor Digre stated that the have to congratulate parents and families, as well as friends who supported him. She stated that he must get up early and eat breakfast to start.

Mr. Patterson stated that the previous year he focused on gymnastics, explaining the basic schedule, which included 5-6 hours in the gym.

Mayor Digre stated that the Historical Society, which does Footprints about the history of Pacifica, will hopefully interview them.

They then took pictures while presenting the proclamations.

Mayor Digre read a proclamation for two Olympians, beginning with Danny Barrett. Mayor Digre asked him if he wanted to comment on whether he dreamed of this day.

Danny Barrett stated that he didn't dream of being an Olympian in rugby but he thought anyone watching would think about being the next great Olympian, and he kind of stumbled on rugby. He thought the timing was perfect. He thanked family for having his back, adding that it took a lot of hard work, but he was happy he stuck to it.

Mayor Digre commented about whether everyone knows what rugby is. She thought, she would know if she was in England.

Mr. Barrett stated that rugby was American football backwards, and the origin of American football, which came from a soccer game in the 1800s. He gave a brief description of what the game involved, adding that it was not well known but would become more known after the Olympics.

Mayor Digre stated that they will read Ryan Patterson’s proclamation and then they will take both of their pictures at the same time. She then asked Danny Barrett if he plans to continue with rugby.

Mr. Barrett responded affirmatively, stating that he will be driving down to Chulavista where there is one of the four Olympic training centers. He will be there the next week and they will have their first tournament in Dubai, then to So. Africa to play in Johannesburg, with ten stops around the world. He stated that U.S. rugby will be in Las Vegas in February.

Fog Fest Presentation

Larry Passmore, President of FogFest, thanked Pacifica, staff, police, school district for their support, and stated that the Jefferson Union High School District will be joining them this year. He briefly gave a summary of the past year’s events and participants. He then mentioned that Danny Barrett will be the honorary Grand Marshall for this year’s event, but Ryan Patterson will
be out of town and will not be able to be present, adding that if he comes back at the last minute let them know. He then presented Council with this year’s poster.

CONSENT CALENDAR

Council Nihart referred to Item 5, and thanked everyone who worked on one of the better ordinances. She stated that, so often this is written for an illicit business than for the therapeutic massage that is vital to so many people. She felt this was so much better than what was out there, and the state association was looking at it as a model.

Mayor Digre added that it was protecting small businesses which was important.

Mayor pro Tem O’Neill thanked staff, mentioning that he has gone through 8 school remodels and it was nice that when a change order comes through they are keeping a running total. He stated that the City Manager will keep that with every report that comes in because inevitably there are change orders. He complicated staff for their help so Council can keep track of the money being spent.

Councilmember Ervin commented that there was so much work done on the consent agenda. She stated that the local hazard mitigation plan update was a phenomenal piece of work. She commended Captain Spanheimer and anyone else involved in the work, such as the stem grant with which Director Perez was involved, and she appreciated all the work they put into it.

Mayor Digre thought those were excellent points. She added that people should look at it as it was very important and well done.

RESULT: ADOPTED [UNANIMOUS]
MOVER: Mike O’Neill, Mayor Pro Tem
SECONDER: Karen Ervin, Councilmember
AYES: Digre, O’Neill, Ervin, Nihart, Keener

1. Approval of Disbursements for 08/03/16 through 08/31/16
PROPOSED ACTION: Move to approve attached list of disbursements for 08/03/16 through 08/31/16.

2. Approval of Minutes
PROPOSED ACTION: Move to approve the minutes of the special City Council meeting held on August 8, 2016.

3. Proclamation Confirming Existence of Local Emergency of the Pacifica Coastline from Westline Drive to the End of Beach Boulevard.
PROPOSED ACTION: Accept current photos as of August 17, 2016 (Attachment 2) and move to continue proclamation confirming the existence of local emergency.

4. Adoption of an Ordinance to Amend Chapter 4, Title 9, Permitted and Conditional Uses in the C-1, Neighborhood Commercial District of the Pacifica Municipal Code (Second Reading)
PROPOSED ACTION: Move to adopt "An Ordinance to Amend Chapter 4, Title 9, Permitted and Conditional Uses in the C-1, Neighborhood Commercial District of the Pacifica Municipal Code.

5. Adoption of an Ordinance of the City Council of the City of Pacifica Repealing Existing Chapter 19 and Enacting New Chapter 19 (Massage Businesses) to Title 5, Public Welfare, Morals, and Conduct, of the Pacifica Municipal Code, Relating to the Regulation of Massage Business (Second Reading)

PROPOSED ACTION: Move to adopt the ordinance entitled "Ordinance of the City Council of the City of Pacifica Repealing Existing Chapter 19 and Enacting New Chapter 19 (Massage Businesses) to Title 5, Public Welfare, Morals, and Conduct, of the Pacifica Municipal Code, Relating to the Regulation of Massage Business"

6. Resolution of the City Council of the City of Pacifica Authorizing Staff to Execute a Contract with the County of San Mateo Human Services Agency to Provide Out-Of-School STEM Hands-On Learning for Elementary/Middle School Youth (Award of Funding in the Amount of $27,720).

PROPOSED ACTION: Move to approve a “Resolution of the City Council of the City of Pacifica authorizing staff to execute a contract with the County of San Mateo Human Services Agency to provide Out-of-School STEM Hands-on Learning for Elementary/Middle School Youth.”

7. Amendment No. 1 to the Consultant Services Agreement Between the City of Pacifica and Terraphase Engineering in the Amount of $24,500 for Additional Environmental Impact Evaluation Necessary to Complete the Environmental Phase of the Waste Water Equalization Basin Project.

PROPOSED ACTION: Approve Amendment No. 1 to the Consultant Services Agreement Between the City of Pacifica and Terraphase Engineering in the amount of $24,500 to perform additional environmental impact evaluation to complete the environmental phase of the Waste Water Equalization Basin Project; and authorize the City Manager to execute contract amendments not to exceed $40,000.

8. Memorandum of Understanding with Pacifica Battalion Chiefs Teamsters, Local 856

PROPOSED ACTION: Move approval of the Memorandum of Understanding as presented.

9. Local Hazard Mitigation Plan Update

PROPOSED ACTION: Adopt Resolution accepting all of Volume 1 and the City of Pacifica’s portion of Volume 2 of the San Mateo County Hazard Mitigation Plan Update.

ORAL COMMUNICATIONS

Keri Gaillouy, San Francisco, stated that she has currently resided in the Richmond District of San Francisco and works at the UCSF Medical Center for ten years. She was a representative of the working poor, stating that she would never be able to own a house with the salary she makes. She discovered tiny houses which allows her to have a roof over her head and take it wherever she went, and allowing the possibility of staying in the Bay Area. She stated that
living simply with a lighter footprint and afford to live independently carries the additional issue of where to find the land to do it. She stated that you can watch TV on building tiny houses but they never tell them where they are going to put it. She stated that is the question, and she was in touch with the mayor. She found a piece of land that she thought would be perfect, but found out it recently sold. She didn’t know if it would be available for a tiny house. She emailed the Planning Department about the city considering alternative housing by supporting pocket neighborhoods made up of independently owned tiny houses on rented land from the city, which might consist of existing buildings that they could use as a community. She also emailed a link for living tiny legally where it has been put into action by City Councils and Planning in Fresno, Ojai and Rockridge, Florida. She hoped to start a dialogue that they could continue talking about as she thought Pacifica was uniquely located, mentioning that the city already had a trailer park and RV park but added that tiny houses were different animals, and people who want to live in them were a different group of people educated in a way of living more lightly. She felt we have the opportunity to plan for our future.

David Ludwig, Pacifica, stated he is an architect, and has been living in a tiny house for ten years. He was present to further the idea that tiny house community would be appropriate for Pacifica. He brought some design work he did in creating a prototype community in Sebastopol. He stated that it was 3 ½ acres with 20 tiny houses. It was the same density as a regular city block and not a trailer park. They focus on gardening and outdoor space. He stated that it was perfect for aging in place. He pointed out the differences between tiny houses and trailer parks. He stated that the difficulty was profit, and when you put profit into the construction, design and management, you make it no longer affordable. He stated that a tiny house community was self-designed and self-managed and was an affordable community with different character, look and focus. He encouraged Pacifica to look at tiny house regulations and rules, mentioning that they are a hybrid between recreational vehicles and small housing units. They were looking for a place for tiny houses to exist between the different codes.

Amy Caplan, Pacifica, stated that she lives on Manor since 1999. She stated that her house is paid off. She worked her whole life and wants to retire but cannot afford the property tax and maintenance on a house facing the canyon and affected by all the wind, rain and elements, mentioning some of the maintenance problems. She stated that she won’t be able to afford to stay in Pacifica as an aging person and she supported the Council having a dialogue on tiny homes. She stated she was a CERT member which gave her a reason to stay. She stated that she knows a lot of people who want to downsize now but are being forced out by the fact that, once they retire, they won’t be able to afford the maintenance and property tax on their homes. She thought teachers and first responders were struggling to live in expensive communities. She thought Pacifica could be a trailblazer for sustainable affordable housing.

Anita Rees, Pacifica Resource Center, stated that they had their relaunch celebration and it was great. She thanked the city staff for helping them navigate the system to make it happen, mentioning that they raised $35,000 toward future services. She thanked those who attended donated and sponsors. She hoped they will be able to start using the new facilities in the near future. She thanked supporters for help with the back to school program, and were gearing up for their holiday programs. She stated that they were looking for volunteers to supply services for tax season.

Dan Stegink, Pacifica, stated that he was addressing city negligence and potential liability. He thanked Councilmember Keener for noticing the medical massage in home and the US team. He referred to potential liability on Crespi between Ladera and Roberts Street. He stated that school kids go there at night since June 2015. He stated that both the lights have been burned
out for the school crossing signs, mentioning the specific failures. He felt this would be a tragedy.

**Kathy McGuire, Pacifica**, stated she was from the Pacifica Historical Society and was inviting Council and all Pacificans for placing the statue of Pacifica in the Coastside Museum. She stated that the original statue was 80 feet high, first seen at the Golden Gate Exposition in 1939-40. She stated that the original statue has disappeared but they have one of two remaining statues. She stated that the celebration is September 23, 6-8 p.m., and everyone was invited, adding that they will be showing a collection of memorabilia from the Golden Gate Exposition.

**John Bogdonov, Pacifica**, stated that he has exciting news. He referred to statements that all politics is local, and he stated that was true for sea level change. He referred to a document on climate change in 2013, reading from the document on sea level change. He stated that he was referring to this in regard to a drop in sea level rise in the west coast America. He thought this was great news and made these points to discourage decision making based on speculations of calamity for Pacifica in terms of the various neighborhoods without a firm grasp of the facts or predictability of events 100 years out or more. He thought such conclusions could be dangerously result driven and not suitable variables in determining the right course of action for West Sharp Park.

**Therese Dyer, Pacifica**, stated that she was upset about public records and wrote a letter to the editor regarding the 501C for the Library Foundation and, under the Fair Political Practice, she was entitled to an answer and she was assuming that there was no answer. She mentioned that she was a secretary for a non-profit organization and she knows they have to apply to the state. She asked for an answer. She stated that the people voted on the library and it was a valid vote. She asked how they dared to get a group at the meeting and put the squeeze to Mr. Keener so it would go on the ballot. She asked if she voted for Hillary and the next day decided to vote for Trump. She stated that they cannot afford a new library. She stated that she got the property tax for that space, and she stated that they only pay $17 for mosquito abatement. She did not think the place for the library should be on this location. She suggested they look for an alternative. She then stated that the City Attorney made a mistake on the vote. She felt that, if she was incompetent and didn't think they need four votes, they need to rescue her. She stated that there are 25 lawyers in San Mateo County that we can contact, adding that we pay for those 25 lawyers and asked why we don't use their legal advice. She added that we would then not be in the problems were are at this time. She referred to liabilities, and agreed we had liabilities, but she was not going to mention the Councilmember's name. She felt the liability was in City Hall, adding that, if they can afford spending money on the library, why can't they put an elevator in City Hall. She was told they were full of termites and she felt that was a liability.

**Bridget Duffy, Pacifica**, stated she was present on the same issue of renters’ rights. She stated that her mother will be 90 in October, on social security, has been in her apartment for 25 years and got a $500 rent increase four months ago and $300 rent increase about three weeks ago. She stated that at 90 years old, they were talking about her life and will not survive a move. She stated that she walked in to the meeting between a banker and a lawyer and she knows they get sitdowns with people being paid with tax monies. She stated that they pay the salaries of all of them, and bankers and lawyers sit down with them and listen to them. She stated that she now has a personal story of a tragedy in the making. She quoted from Martin Luther King, “laws cannot change a man’s heart, but laws can restrain the heartless.” She stated that the Council swore an oath to uphold the constitution and defend the citizens against all attackers, both domestic and foreign. She stated our community is being threatened, and we
are being hammered. She stated that they need their help since nothing else will help them. She begged them to have a heart, adding that people are being disrupted by pure unrestrained greed, called profiteering, which is a person who extorts exorbitant profits by selling scarce or rationed items, such as housing, which is profiteering. She concluded that we need help.

Mike Bell, Pacifica, stated that managed retreat was an ingenious phrase which sounds orderly and peaceful. He felt if that was being proposed for an uninhabited coastal road, it would be a reasonable solution, requiring merely removing the old road and any toxic material, build a new road further inland and compensate the owner for lost property. He stated that, in Pacifica, managed retreat was more akin to the phrase of corporate downsizing which masks the utter devastation to families and communities when large employers fire thousands of workers. He stated that there are people in Pacifica who refuse to differentiate between a lonely stretch of coastal road and Beach Boulevard which cuts through the heavily populated district of West Sharp Park. He felt this neighborhood contains many important things, mentioning specifics such as 7,000 people, 650 homes, 88 small businesses, etc. He stated that he has heard people say that the potential harm to West Sharp Park for managed retreat has been grossly overstated, and they have called managed retreat “save the beach.” He then referred to inundation maps which show the Pacific Ocean going up to Highway 1 which are being used by Bob Batalio and John Keener to frighten the community into accepting managed retreat as the only option to deal with impending sea level rise. He stated that Council candidate Dierdre Martin is calling it “save the beach” and Sue Digre is mum on the subject. He felt that, regardless of what they call it, it all has the same goal, which was to prevent any future maintenance of the urban berms along the golf course and prevent construction of a legitimate sea wall on Beach Boulevard which could protect life and property from all of this devastation.

Councilmember Nihart stated that they have always had a policy of keeping campaign issues out of this, and she asked if that was still something they can do.

City Attorney Kenyon stated that, with public comment, that was within the jurisdiction of discretion that the public commenter is allowed.

Councilmember Nihart stated that they have had that courtesy in the past.

Kelly Bogdonov, Pacifica, thanked Council for scheduling the September 27 meeting to discuss sea level rise and coast erosion. She encouraged each of them to let the public know whether they advocate seeking federal and state grants to build a new sea wall north of the pier to replace the substandard retaining wall and their viewpoint on managed retreat as it relates to Beach Boulevard and the entirety of West Sharp Park including more than 600 homes and 600 rental units. She felt that managed retreat supporters seem to be ignoring that, among the Bay Area jurisdictions preparing for sea level rise, not one is advocating managed retreat for areas with large established and functioning residential and commercial developments. Instead, cities and counties are wisely planning to upgrade coastal and shoreline infrastructure and protect public and private assets that are vulnerable. She stated that there were efforts underway to protect San Francisco International Airport, Highway 101, Treasure Island, etc. She mentioned that managed retreat supporters were ignoring the perspectives of wisely respected elected officials, such as Jackie Speier, Kevin Mullin and Don Horsley, who are encouraging Pacifica to develop a plan to protect and improve our coastal infrastructure and were willing to fight for federal and state grants to build a proper sea wall north of the pier. She stated that Pacifica needs Council’s leadership and support. She urges them to begin formulating a coastal plan to steer Pacifica from the dangerous managed retreat ideology that seeks to dismantle and demolish West Sharp Park and destroy Pacifica.
Tom Richardson, Pacifica, stated that he has spoken before on sea level rise and the retaining wall that needs to be replaced. He referred to an article in the San Francisco Chronicle about sea level rise and where the water will go in San Francisco. He stated that San Francisco was accepting the fact that sea level rise is a reality and they are making plans to do something about it. He stated that, in some of the areas that will be under water in 100 years, they were planning to build houses in those locations and protect the area from sea level. He stated that we have infrastructure we cannot afford to lose. He asked that Council plan for it also and not let Sharp Park go into the ocean. He added that, if they didn’t see it in the Chronicle, it was a good read.

Mary McCall, Pacifica, stated that she has not lived in Pacifica very long, but had voluminous notes on closing the two present libraries. She stated that, without the Sanchez Library, she would be sitting in her room alone doing nothing, having nothing including a TV, but books are her entertainment, mentioning she was a teacher. She stated that she could not get across town to another library, being hesitant to take the bus, stating she only rode buses when taking students on field trips. She stated that she needs the Sanchez Library and would be upset if it closes down.

Anna Boothe, Pacifica, stated that she was happy to announce that they have one united citizen’s group to oppose the library tax. She stated that a bond is an agreement with the bank, and a tax is the money you get from the citizens to pay for it. She stated that they call themselves “Citizens United to Defeat the Library Tax” and will meet at the Social Hall in Casa Pacifica across from the Sanchez Library, mentioning everything they plan to do, adding that they will be going to court if necessary to stop the illegal and unfair procedure. She mentioned that many are against the library tax.

Ernest Straugser, Pacifica, stated that he was there to talk about the new library. He stated that putting every tax payer in debt for 30 years for a library that less than 10% of the population will use was a clear case that our city leaders do not have a clue about logic. He felt our whole city needs cleaning up but our Councilmembers think we need a library instead of fixing our streets. He stated that he visited the two libraries and what he saw was sad, mentioning that neither one looked like they have been painted for years, windows needed cleaning, and carpets were stained, and were in a state of neglect. He mentioned that the city manager stated it cost $1 million a year for each library to operate them. He thought that statement was no where close to the truth because, if that much money was spent, why were they in such bad shape. He thought the libraries were purposely run down to make it look like a new one was needed. He stated that whenever developer tries to build, they are put through studies, etc., but he has never seen a report on how many people use the libraries on a daily or annual basis. He stated that the bond measure has been in the works for years and the leaders got their ducks in a row when they hired the city manager, not hired for her strong managing skills but she got a new library built in the last two towns in which she worked. He mentioned that she did get 1/4 of Linda Mar Boulevard paved and a handicapped ramp installed. He referred that the street is 2 miles long and only ½ a mile was paved, asking if it was because we ran out of money. He stated that Pacifica needs additional revenue, and he felt the leaders were not doing what was best for the majority of our population, asking how much revenue a new library will generate. His response was nothing.

Victor Spano, Pacifica, stated that he sees a lot of working people from the hospitality industry present, and he asked if they would consider advancing the Beach Boulevard item to the first of consideration.
COUNCIL COMMUNICATIONS

Councilmember Nihart stated that the Transportation Authority met and they moved forward with additional funding, but she didn’t think it appears that they will replace the stip funding. She mentioned that these were the transportation dollars that pave rounds. She stated that there are specific pots, such as streets and roads which has been limited in terms of what the state was willing to share out of tax dollars and Measure A funds are very limited. She stated that, in both cases, it looked like a bleak year. She mentioned that she sits on ABAG and stated that, in terms of One Bay Area planning and following some of the concerns she heard at this meeting was a serious problems with a lot of tentacles. She mentioned that they can’t address specific issues brought up in oral communications in detail, but she did say that displacement and the issues around affordable housing are huge issues that have been growing each and every year, in One Bay Area planning, they were focused on issues around displacement. The One Bay Area grants and funding will now have a requirement of displacement being an element of scoring to receive those grants. She stated that displacement was left to the counties to implement, and she stated that it was an amazing discussion to witness when the full board talked about it in ABAG because not one city had displacement policies in place that were addressing what they were talking about. She thought it was clear that this was something we have to address at some point, sooner, rather than later. She then stated that what they believe to be the final meeting for the water committee of CCAG will be on the 29th, and they will come back with sea level rise, flooding issues, etc., with a decision on an organized group to look at those. She stated that they were leaning toward a body representing all 20 cities. She was concerned that they have a consistent policy as a Council on how they approach study sessions. She stated that she wanted to attend the rent control study session but they had it for Councilmembers and they had to wait for all Councilmembers for sea level rise. She stated that she wanted to be sure they address it in a fair way with a consistent approach. She hates to take anything from mayor discretion and she noticed and was concerned.

Councilmember Ervin attended the legislative committee from San Mateo County. She stated there were interesting issues coming up, such as cap and trade. She stated that businesses were doing well with the regulations behind cap and trade and we are getting less money and there aren’t as many businesses and they are doing a good job reducing green house gas emissions and the city is receiving less funds and preventing the city from having money for transportation issues. She preferred that they do reduce green house emissions, but that was an area where they are running into shortfalls from expected budgets and was a conundrum that they have to address in the future. She was a member of the bike and pedestrian advisory committee and they discussed was rubrics that go behind determining a project that would be granted funds. She stated that now you have to be within ½ or 1 mile from PDA, a priority development area, and Pacifica does not have a PDA in Pacifica, so it makes it more difficult for Pacifica to get funding for all sorts of project and is an issue the city has to address, in getting a PDA in Pacifica to house people and be accessible to buses, etc. She thanked Anita Rees for the beautiful event. She acknowledged that she was doing a phenomenal job growing their area to serve Pacifica.

Mayor Digre didn’t think any Pacifican was happy with the airport news. She stated that she asked the San Francisco Roundtable to take on two roles, rather than one, that is, work with the FAA regarding their initiatives which will take two years to get any kind of solution and no guarantee they will be happy with that. She asked the SFO legislators if they would consider a dual role to become an advocacy group and they did agree. She stated that they didn’t have a subcommittee scheduled as yet, but she was pressing for it and she hoped it would happen relatively soon as the main idea was to not have our issues linger for two years.
STAFF COMMUNICATIONS

City Manager Tinfow stated that she had two items she wanted to share with Council and the community. She stated that five weeks ago they started a new community outreach effort called Connect with Pacifica, which is an email message to people who signed up to receive updates from the city highlighting city news, dates and press releases, typically sent out on Thursdays. She stated that anyone interested can contact her office, 650-738-7409, and ask to be added. She then offered more information on the sea level rise study session scheduled for September 27. She stated that she hasn’t selected a place as she is trying to gauge the numbers but the Chambers might not work if they get a larger more interactive group and they need a larger space. They will communicate the location through Connect with Pacifica.

Councilmember Nihart stated that the strategic plan for transportation has been released for public comment for San Mateo County and the first public outreach meeting was also scheduled for the 27th. She stated that she asked to have it changed but she did not know if she had any further information on that.

City Manager Tinfow stated that she has not had any information on that.

PUBLIC HEARINGS

None.

CONSIDERATION

10. Annual Report to City Council from the Economic Development Committee (EDC)

PROPOSED ACTION: Receive and Accept the Annual Report from the Economic Development Committee, and provide direction on its activities.

Mayor Digre stated that one Councilmember cannot participate in Item 12, and they will go as quickly as they can.

Peter Menard, Economic Development Committee, apologized if there was any formatting that was not right. He introduced the members, then presented the report.

Kevin Cuba, Economic Development Committee, continued the report.

Brent Shed, Economic Development Committee, continued the report.

Mr. Menard concluded the report.

Mayor Digre opened public comments.

Dan Stegink, stated that he had attended several meetings and he was disappointed that he had not heard anything about bringing good jobs to Pacifica, referring to their support of 7-Eleven which paid cashiers only $9.10/hour, adding that the state minimum wage went up to $10/hour and they do pay that. He stated that he would like them to spend time on bringing good jobs to Pacifica.

Mayor Digre closed public comments.
Mayor pro Tem O’Neill thanked the committee for all the good work they do and for their brief report.

Councilmember Ervin stated that she was serving as a liaison on the committee, along with Mayor Digre. She felt it was a phenomenal group with time and effort and she felt they have brought the city forward. She appreciated all the work they have done to enhance Pacifica and make it better than it already was. She appreciated their effort, as well as staff, as they work together to brainstorm on potential solutions. She also appreciated the meeting hosts.

Councilmember Nihart echoed those comments, adding that this has come a long way since the inception. She thanked them and staff for all the work they are doing.

Mayor Digre was also pleased and she liked the new trend of going out into the community and fixed the agenda so the public can participate in the discussion. She mentioned that there may seem to be some things lacking but she felt a majority have taken a lot of vision and discussion. She encouraged the public to come.

11. Resolution Authorizing Refunding of 2008 Certificates of Participation

PROPOSED ACTION: Adopt the resolution entitled "A Resolution of the City Council of the City of Pacifica Authorizing to Refund Outstanding 2008 Refunding Certificates of Participation, and Approving Related Documents and Official Actions."

City Manager Tinfow stated that the recommended action only describes one of the resolutions, so she asked that, at the conclusion of the oral report, they help Council include both resolutions. She stated that they were both attached to the report but the wording on the recommended action may not be quite complete.

Asst. City Manager Hines first introduced Scott Nagelson, Chick Adams and Peter Wong and then presented the staff report.

Councilmember Keener congratulated them for identifying this opportunity and going after the savings. He hoped Council will give them a chance to get them. He wanted to go through the actual indebtedness.

Asst. City Manager Hines asked him what document to which he was referring.

Councilmember Keener stated that he didn’t have it before him and they would just have to listen. He then referred to the city leasing the police station and the Fairmont Park West to the financing authority for nothing and the financing authority turns over certain rights to a trust fund of the bank, i.e., the ability to lease the properties back to the city and the lease payments are payments on the bonds. He asked if that was what they were doing.

Schiff Hardin, bond counsel firm, stated that was what was essentially happening, which was the way cities borrowed money on a long term basis and what Pacifica has previously done. They were continuing the financing structure that has been in place since the beginning and he was essentially correct.

Councilmember Keener referred to the AA- rating which was great. He referred to mention that a downward revision of this may have an adverse effect on marketing, and he asked if the rating
was locked in for the duration of the sale of the bonds.

Asst. City Manager Hines stated that the rating was locked in for the sale of the bonds until the city gets re-rated by S&P or they decide to rate them voluntarily.

Councilmember Keener assumed it would be in about a year or so.

Asst. City Manager Hines stated that it could but depends on future financial transactions.

Mr. Adams stated that any changes in the rating will not affect the interest rate after the bonds are sold.

Councilmember Keener thought they would all be sold in late September.

Asst. City Manager Hines responded affirmatively.

Councilmember Keener referred to savings of $3.3 million in debt service and he thought that was the principal and interest of the old bonds minus the principal and interest of the new bonds. He asked about the underwriting fees, etc.

**Scott Nagelson, US Bank**, stated that all the fees or cost of issuance, whether legal, underwriting, etc., were included in the par value of the refunding bonds, and the savings reference by the Asst. City Manager are net of those fees.

Mayor pro Tem O’Neill stated that, in the old bonds, they had a provision that they could call them at the premium of 102, and he asked if they were going to keep the same provision in the new bonds.

Mr. Nagelson stated that it was a fairly old provision and the modern marketplace will allow them to have a par call with no prepayment penalties in ten years. It will be a much simpler call provision going forward.

Mayor pro Tem O’Neill stated that pars is usually 100. He stated that he said they don’t allow them to have a call at par but he asked about a par plus a premium, adding that this was a par plus a premium.

Mr. Nagelson stated that the 2008 bonds were done allowing them to call the bonds after ten years at 102 declining to par in 12 years. Going forward, he stated that the 2016 call provision will just be a ten-year par call and no 2% premium.

Mayor pro Tem O’Neill understood, asking confirmation that they are non-callable for ten years.

Mr. Nagelson stated that was pretty much an industry standard.

Mayor pro Tem O’Neill stated that one thing that got people’s knickers in a twist was the pledge of up to 20% of our gas tax revenue to pay the old ones. He asked confirmation that the provision was no longer there for this.

Mr. Nagelson agreed that the gas tax pledge has been removed. It was a feature of some of the earlier financing but they have not carried it forward into the new financing, stating that it does not significantly add to the credit and the decision was made to drop it.
Mayor pro Tem O'Neill concluded that it now becomes a regular budget item.

Mr. Nagelson responded affirmatively.

Mayor pro Tem O'Neill assumed that they have to appropriate every year.

Councilmember Nihart liked the way he laid it out, but she wanted to talk about the credit rating change, stating that it actually relates to the gas tax to some degree. She stated that, when we were not as good a shap creditwise, they were leveraging more things to get the bond rate. She asked if that was true.

Mr. Hardin stated that, back in 2012, S&P downgraded the city to an A- and the city was coming out of the recession, and budget deficits like other cities. He stated that in the opinion of S&P, the city has made tremendous strides with balancing the budget and building up the reserves. He stated that, overall, the city’s credit has improved substantially.

Asst. City Manager Hines added that, during this presentation, they were able to inform S&P of some of the projects they had and were looking at as a city and they found that encouraging that the city was making use of their competitive advantage.

Councilmember Nihart stated that was what she wanted to do and she wanted to make sure that the public understood the changes that occurred to improve the credit rating. She asked if he wanted to take anything else that S&P took into account in doing so, adding that it was the highest rating she has seen since she was on Council and was really happy.

Asst. City Manager Hines was glad she was happy. He added that it was a matter of letting them know financially that the revenues are exceeding expenses, and the General Fund balance is growing. He stated that they have a number of development projects in the works and in the decision making pipeline. He stated that they thought they were little old Pacifica when they sat down but, by the time they got up, they let them know we were a city on the rise.

Councilmember Nihart asked if the fact that there was clarity in the city’s finances throughout had something to do with it.

Asst. City Manager Hines responded that it definitely did.

Councilmember Nihart wanted to make sure that came out. She stated that it was easily understandable to almost anyone at this point in time, whereas before, it was weird gobblygoop. She thought that helped.

Councilmember Ervin thought most of her questions have been asked and she just wanted to commend them on the work in getting their credit rating advanced which had a great deal to do with the finance department and the city manager. She stated that she was on the Financing City Services task force from 2008 to 2012 and they were little old Pacifica back then, and she felt the level to which they have grown was hard to express. She felt it meant a lot to all of Pacifica and it was bringing the city forward in a way that was good for everyone. She thanked them for all the work in getting the city to where it was now.

Asst. City Manager Hines would like to, not only thank Council and City Manager Tinfow, but also thank the three gentlemen as when he walked into the office he felt like he was a member
of the Beatles, part of a strong group, and it felt good to do that.

Mayor Digre thanked “the Beatles.”

Mayor pro Tem O’Neill stated that he met with the City Manager in the afternoon and he mentioned that they were front loading the interest savings, and he thought that was the correct term.

Asst. City Manager Hines responded affirmatively.

Mayor pro Tem O’Neill asked him to explain the benefits the city will be getting from that.

Asst. City Manager Hines stated that right now the bonds are due to mature in 2037 and they have the option of realizing the savings between 2017 and 2037, somewhere between $100,000 and $150,000 a year, depending on market fluctuations. He stated that they chose to capture the savings up front in the first seven years, if anything to provide a buffer for economic uncertainties, as he thought the end of the decade was coming and, typically at the end of the decade, there is some sort of restructuring, reset, and something will happen in the market. The issue they had before, back in 2006 through 2008 was that they weren’t ready and as a result they suffered. He was trying to make sure they are ready and we can get through any storm that comes, economic or mother nature.

Mayor pro Tem O’Neill commended the fact that they were having a long term plan instead of a drunken sailor going from binge to binge and he commended him for the sobriety of having a long term plan.

Asst. City Manager Hines thanked him.

City Attorney Kenyon stated that the process was that the City Council was taking one action to adopt the first resolution and they will adjourning and opening up the meeting of the Financing Authority and they will be adopting the resolution to be adopted by the Financing Authority Board; reiterating adopting the first motion and the second to adopt the second and then the mayor will adjourn the City Council meeting, open up the Financing Authority meeting and get another motion for that resolution.

Councilmember Nihart moved to accept the resolution of the City of Pacifica, authorizing the delivery and sale of refunding certificates of participation in the maximum principal amount of $17,500,000 to refinance the 2008 certificates of participation and approve related documents and actions; seconded by Mayor pro Tem O’Neill.

Mayor Digre adjourns the City Council meeting to open the Pacifica Financing Authority.

Mayor Digre reconvened the City Council meeting to open the Pacifica Financing Authority.

Mayor Digre reconvened the City Council meeting and called a short break.

Councilmember Nihart stated that she will be leaving because the last item falls within 500 feet of her property and cannot be in the room.

Mayor Digre reconvened the meeting.
12. Developer Selection and Authorization to Prepare and Agreement to Negotiate Exclusively for Development at 2212 Beach Boulevard

**PROPOSED ACTION:** Move to approve the selection of recommended development team, James H. Friend of Friend Development Group LLC, based on the proposed hotel and restaurant concept submitted for 2212 Beach Blvd.; and authorize the City Manager to prepare an Agreement to Negotiate Exclusively (ANE) with the selected developer for subsequent City Council review and approval, and take all necessary steps to do so.

Economic Dev. Mgr. Stedler presented the staff report.

**Sondra Storm,** stated that Mark would present the next portion of the report.

**Mark Keller,** continued the staff report.

Economic Manager Stedler continued the staff report.

**Tim Kelly, Keyser Marston Associates,** continued the staff report.

**Dilip Trivedi, Moffat & Nichol,** continued the staff report.

Economic Dev. Mgr. Stedler then completed the staff report.

Mayor pro Tem O’Neill asked if he heard correctly that the Friends group would be the builder, owner and operator of the hotel.

Economic Dev. Mgr. Stedler stated that the Friend would be responsible for all those phases.

Mayor pro Tem O’Neill concluded they would be the long term person managing the hotel.

Economic Dev. Mgr. Stedler stated that they would be the long term person responsible for the management, adding that they expect that they will seek a management partner that would handle day to day operations. She stated that was what they represented but would still be the responsible party in terms of owning and managing the property.

Mayor pro Tem O’Neill asked if there was an estimate as to how much a room would be each night.

Economic Dev. Mgr. Stedler stated there was not at this time, or she is not aware of the estimate at this time because there are years before they are at the point of renting a room.

Mayor pro Tem O’Neill stated that they came up with an estimate of $900,000 in TOT tax so he thought they have to have some basis to arrive at that number.

Economic Dev. Mgr. Stedler stated she would have Tim Kelly respond to that question.
Mr. Kelly stated that it will be approximately $200/night.

Mayor pro Tem O’Neill asked roughly how many hotels are in the tier of this hotel.

Mr. Kelly explained that there are national brands and independent hotels that are nationally categorized by the company within one of these tiers but some locations go either direction because of quality and amenities. He stated that everything discussed were between upscale and upper upscale, with some having elements that tip into the luxury area. He stated by comparison, the existing hotels in Pacifica tap out in the upper midscale generally. He pointed out that there are three categories, economy, midscale, upper midscale and they top out with Holiday Express, Best Western Plus, Pacifica Beach Hotel, with a little bit of upscale. He stated that there were expecting any submitters to do a hybrid upscale or upper upscale type of property.

Mayor pro Tem O’Neill asked how many are there at that level in the north Peninsula.

Mr. Kelly stated it depends on definition of north Peninsula.

Mayor pro Tem O’Neill stated he referred to San Mateo County.

Mr. Kelly stated that there were none in Pacifica but, if you stop at the ridge and go south to Half Moon Bay, depending on how you define it, there are a couple of small ones, mentioning the Ritz Carlton in the luxury category. He stated that for the upper upscale or more upscale, there weren’t many, and he felt they would be pioneering this side of the ridge.

Mayor pro Tem O’Neill asked about over the hill.

Mr. Kelly stated that there are many but many are older. He stated that the bigger single market in San Mateo County is those by the San Francisco Airport.

Mayor pro Tem O’Neill asked the average occupancy rate for Pacifica.

Mr. Kelly stated that they can’t disclose proprietary information, but it was very solid that the operators in Pacifica are looking forward to more hotels which he stated was an unusual thing. He thought it was 70% and up. He stated that typically, Sunday nights drop in occupancy and with something north of 70% means that certain days of the week are sold out.

Mayor pro Tem O’Neill asked if he was saying it was around 70% Monday through Thursday and weekends in the 90s.

Mr. Kelly stated that certain times a year it will drop below 70% Mondays through Thursdays. He thought it was part of the opportunity, stating that all of the hotel discussed for this site can attract a lot of business meetings, getaways, with people staying at hotels with the opportunity to expand Monday through Friday. He stated that it would raise the boat for itself and other properties.

Mayor pro Tem O’Neill asked if he has any experience on how long it takes the Coastal Commission to give approvals for hotels.

Mr. Kelly stated that it varies widely, knowing friends who have dealt with it on the coast, and the key element was how much the prospective development aligns with their stated interest,
and they felt in this case it does, and the complexity of the development was also related. He stated that, the more moving parts, the less likely it will happen fast.

Mayor pro Tem O’Neill assumed this was a relatively smooth transaction.

Mr. Kelly stated that, from what they have read and understood, he agreed it would be excellent that way. He stated that, it was a limiting factor since they don’t have unlimited stories in terms of vertical use and not that big in terms of footprint. He stated that it helps as it limits the possibilities.

Mayor pro Tem O’Neill asked if it was going to have one or two restaurants.

Mr. Kelly stated that he didn’t want to speak to the final thing as it was a preliminary design, but he thought it was one restaurant and a café.

Economic Dev. Mgr. Stedler stated that, at this point in time, that was accurate at the concept level.

Mayor Digre stated that it was 10:30 and they needed to talk about how late they will run, adding that they have quite a few cards.

Councilmember Ervin suggested 1:00 or 2:00, stating they had 40 cards times 3.

City Manager Tinfow stated that 40 cards times 3 was 120 minutes which was two hours of public comment and time for deliberation.

Councilmember Ervin moved that they don’t go any later than 2:00 a.m.; seconded by Mayor pro Tem O’Neill.

Mayor pro Tem O’Neill clarified for the audience that they have a standing rule that, if they are still in session at 11:00 p.m., they have to vote whether they want to continue business and finish. They will be voting that they will not stay past 2:00 this morning.

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City Manager Tinfow suggested that they shorten it to 2 minutes, but following reaction from the crowd, she took back her suggestion.

Mayor Digre opened public comments. She asked that the audience not clap but raise arms or smile instead.

Chris Henry, A. F. Canta Team, stated that they have been involved in putting together a proposal. He stated that it was one of the most unusual processes he has ever seen. He stated that they were being sold a bill of goods. He stated that, based on the documents presented, the proposal put before today outlines a Hilton Garden Inn and as someone who specializes and runs a country in creating destination hotels and resorts around the world, he can’t think of anything less unique than a Hilton Garden Inn. He then shared information, stating that he had a call with several people in the room. He stated that the city outlined their updated agenda, adding that not all amendments to the RFQ were published and one was that they were not concerned about creating jobs, choosing a service that limits the number of jobs created. They don’t care about increasing wages as they created jobs are low paying jobs in a
select service economy hotel. He stated that their proposal had a housing element, but they
don’t care about affordable housing and were told that was not important in this community.
They also included houses for sale which would raise property values and they don’t care about
that either. He suggested they take a step back and have the public review which was
supposed to be carried out. He stated that it will outline all of the deficits of the proposal
selected today, and what they took away from the public on which to comment. He stated that
this was the future of the city. He stated that they weren’t saying their proposal was the best,
although they believe it is, but the residents need to have a voice in what happens. He stated
that it was a very unique opportunity as there aren’t many beach communities that have a beach
front site that has an increase in value to generate a unique destination. He stated that they
have a prototype or model in their proposal with schematics, etc. He stated their ADR is
$280/night and occupancy is 78%. They are activating Beach Blvd. And Palmetto Avenue.

Eileen Canta stated that A. F. Canta proposed a destination boutique hotel in accordance with
an RFP that will lead the redevelopment of the downtown community and their project will cater
to business clientele during the week and vacationers and locals on weekends. Their rendering
of a California ambiance transforms the site to an elegant but relaxed atmosphere. She stated
that, in today’s market boutique hotels have an extremely appealing vibe for today’s traveler
looking for a personal and authentic experience. She stated that their vision is the only one that
encompasses a high end boutique hotel with a casual and engaging restaurant serving both
guests and locals along Palmetto Blvd. On the other end of the hotel with sweeping views of the
Pacific Ocean with an elegant steakhouse and a beach bar. She stated that other amenities
include spa, retail spaces, fitness center and outdoor recreational activities. She stated that the
project also calls for affordable and market rate housing. They assembled a team with a track
record for developing iconic California coastal projects, such as Ritz Carlton in Half Moon Bay,
Ritz Carlton in Laguna Nigale, etc. She stated that A. F. Canta will be involved in the
community by giving to charitable causes which enhance the quality of life in Pacifica such as
local community events, etc. They have also addressed the need for prevailing during
construction and living wage for hotel employees. They are excited to be the newest member of
the Chamber of Commerce and play a role in FogFest if permitted. She stated that this is close
to her heart as she has been engaged with the city for over five years. She stated that they look
forward to welcoming them to the Linda Mar Hotel to rejuvenate mind, body and soul, and she
stated that their project will put Pacifica on the map, but a select service will not.

Lief Paulson, Pacifica, stated that he was asking them to vote no on the proposed hotel project
on Beach Blvd., as it comes without any guarantees that the developer would respect hotel
workers’ right to organize. He mentioned his family’s history in living in an expensive area
where they looked to training in union jobs to remain in the Bay Area. He hoped that they see
how important health care and good wages are to everyday people. He stated that the kind of
jobs this deal creates does not guarantee this pathway, mentioning that the developer has
refused to sign an agreement to be neutral and respect the workers’ right to form a union. He
stated that the community doesn’t need bad low wage jobs. He asked that they say no to this
project and look for a developer that will represent working people that can bring what they told
to bring as well as pride and dignity and they know they have a voice on the job.

Victor Spano, Pacifica, commended staff for doing this RFP, RFQ, as it has been discussed
for a long time. He mentioned that his first experience with Beach Blvd. Was in 1993 when
John Hill and Mike Crabtree did a charette at the library on possible uses at the site. He thought
it was great that, historically, there was public input as to what the neighbors and city want to ee
at the site. He mentioned that they conducted the RFP, RFQ, and released all the designs with
no community outreach to see what the community would like to see. There was an RFP RFQ
with a mix use site with residential higher end hotel. He thought the Friend group seemed qualified, but he wasn’t sure they meet what was in the RFP RFQ that the neighborhood and city residents bought into, as well as the Council. He advocated that the decision to award the ERN be continued until the community has an opportunity to view all the designs and see what was the best fit.

Peter Menard, Pacifica, understood that years ago the City Council set three goals for developed the property that Mgr. Stedler referred to in her presentation. He stated not one goal involved trying to remedy a serious problem in our economy, wage levels. He felt government was the best and sometimes the only way to provide a just and humane economy and make real change in the system. He wished living wage was a goal for developing the property and discussions could have begun with that expectation. He wanted to bring up the cost of inaction and continued vacant property. He stated that there were no prohibitions against organizing. He thought to organize and move the movement forward would not stop by going with a developer with no guarantees, but he felt if they continue to have vacant property, we are a city that doesn’t have the resources to fighting larger battles. He stated that we have professional staff to strengthen the city to take stronger stances proactively from onset rather than reactively with a bait and switch. He was an active union member as a public school teacher and they helped him provide health care for his kids, etc., but he was also familiar with winning a lot of small battles and losing the war. He was wholeheartedly behind the cause, he did not think Pacifica was the enemy. He didn’t this property would further the cause, but continue to strap the city with more expenses and deprive us of revenue that could strengthen us to play a more progressive role in the Bay Area. He asked, regardless of the decision, that they keep it moving forward so the city can become stronger.

Brent Shedd, Pacifica, stated that any successful investor will tell you that timing is everything. He stated that this space is not a park, a place to hike, but essentially a brown field. He stated that it is a blighted area sitting there for 16 years not generating any kind of revenue for this city. He stated that they have a chance to develop it and generate revenue for a city that needs the revenue. He stated that Karen mentioned that Pacifica was finally getting some steam behind it and moving forward. He felt this was a lot of steam that can move Pacifica forward and he feels like we are looking a gift horse in the mouth if we don’t move forward on this and he encouraged the Council to vote yes for progress and get it done, rather than lose the opportunity and it sits there for another 16 years.

Carolyn Jaramillo, Pacifica, stated that she has lived on Manor for 29 years. She owns the house free and clear with no bank mortgages, and she was that fortunate because she had a union job for 25 years. She asked that they go forward, put Pacifica on the map and known for the way it treats its workers and people who need to rent and need housing, as well as on the map for justice. She asked that they not do business with anyone that was not going to respect workers’ rights and the right to form a union.

Gloria Stofan, Pacifica, stated she has lived in Pacifica since 1966 and was now retired, but she was a union member and her husband who worked for the fire department was a rep for the union. She felt it was important to have a way to communicate, if not a union rep, at least a place where you can work with your employer to get some satisfaction if things are not going well on the job. She stated that what she heard sounds wonderful, and she was pleased that there was some type of information that the audience got. She thought they were only looking at part of a plan which didn’t seem to include staffing needs being addressed. She felt that was important in a community that cares. She stated that they have been working on affordable housing for a long time. She stated that they need developers who will pay a fair, living wage to
their employees and also be willing to allow their employees the right to organize without fear of retaliation or harassment and the developer needs to be willing to sign a neutrality agreement that would protect employees rights to organize into a union. She stated that non-union jobs are poverty jobs, unaffordable health care, no pension, etc. She urged the Council to work with the developer for a fair living wage and that the developer be willing to sign a neutrality agreement.

Shanti Davidson, Pacifica, stated he was advocating on behalf of Local #2 for a neutrality agreement between whatever developer they choose for the site as housekeeping deserves an honest day’s pay. He stated that Pacifica has a traffic problem, and was an increasing problem because the working class can’t afford to live here. If you aren’t paying union wages, they won’t be able to afford to live here and will increase the traffic problem we see every day. He then mentioned paying a prevailing wage for whoever constructs the project. He stated that, with any large scale project, the developers flies in the workforce from other states where the cost of living is drastically lower and work for a percentage of what the local workforce can afford. He asked that they insist on prevailing wage and hiring locals. He asked they do the simple and smart thing to keep our money local, adding that we have a workforce in the Bay Area and we need to keep it that way. He asked that they address the issues of AirBnB. He stated that we must ask the hotelier to be union and pay prevailing wage and only fair that they ask AirBnB and other sites to pay the transient occupancy tax. He stated that, while he didn't know if it was accurate, figures are being kicked around that it was about $400,000 a year that we are losing to AirBnB. He stated that, if you add the short term rentals that operate out of Pacifica, the city is looking at a figure of upwards of $500,000 that the city is losing. He stated that, if AirBnB was not going to pay union wages, the very least they can do is pay their taxes. He stated that none of the existing hotels or those being built can afford to have these people undercutting by not paying their taxes.

Ellen Hage, Pacifica, stated that she was present to urge Council to vote no on selecting any of the proposed hotel developments that do not agree to remain neutral and respect workers’ rights to form a union. She stated that she used to be a member of the teamster’s union which provided health care, retirement benefits and a living wage that allowed her to afford to live in the community. She stated that hotel workers deserve no less.

Clare Jackson, Pacifica, stated that she is a Pacifican for ten years and an educator involved in the education issues in Pacifica. She stated that before she was involved in education, she worked with non-union hotel and restaurant workers. She stated that the developers talked about this being a vision in line with our community and she has a problem with that because the strength of Pacifica’s community was its union educators, fire fighters, police officers, health care workers, etc., and were the police who can afford to live in our city. She felt that building a non-union hotel that does not agree to a card check neutrality agreement goes against the vision of the community, as we need to have job where they can actually afford to live here. She stated that not agreeing to a card check neutrality agreement will allow them to intimidate workers to the point that they can’t have a union. She urged Council to vote no and stay in line with the vision of the community and support jobs where people can stand up for their rights and have good wages, etc.

Valerie Lapin, Pacifica, stated that she has lived on Manor Drive for the past 18 years. She was concerned about what was happening in our community. She stated that Pacifica was once a place where working families could live but now they see longterm residents being displaced from their homes, without affordable healthcare and living in fear about how they are going to survive in their retirement. She stated that now people want to come and build a hotel on property that belongs to us but refuse to provide any assurance that they will respect the
workers if they choose to exercise their right to form a union to have living wage jobs with affordable health care and retirement with dignity. She asked if we were going to sell of the land knowing that they will be accelerating the race to the bottom. She was disappointed and surprised that they would consider such a proposal. She stated that the presentation didn’t even address the nature of the jobs. She felt we had an opportunity to create a development with good jobs for local residents. She asked that they demand much more. She urged that they vote against any hotel proposal that does not include a card check neutrality agreement.

Gladys Madriz, Pacifica, stated she is a Pacifian on Perry Avenue for about 15 years. She was very concerned about the building of the hotel. She understood that a new hotel will bring revenue for our city which is good, but she asked what kind of jobs it will bring. She stated that we don’t need more low income jobs. She stated that living in Pacifica is not cheap and we need to create jobs for our people that are dignifying and are good paying jobs with benefits. She knows that it can be guaranteed with the help of a union. She stated that they need to be assured that the builders will respect the Pacifica hotel workers, and she asked that they say no to this hotel project developer.

Mike Lagomarsino, Pacifica, stated that he is with teamsters, Local 856, and a 13-year Pacifica resident. He urged a no vote on this project. He stated that he represents 1,100 hotel workers in San Francisco and San Mateo County. He stated that they enjoy respect on the job with good contracts through collective bargaining, and get a living wage with benefits paid by the employer which includes retirement medical and pensions. He stated that he heard a lot of glossy terms from the proponents of the proposal, but there was no mention of workers and what they deserve to have and what Pacificans want and demand that they get to approve this project and therefore urges a no vote.

Kyle Baptista, San Bruno, stated that he was asking for a no on the hotel project at Beach Blvd. Because it is without any guarantees that the developers would respect the hotel workers’ rights to organize. He stated that his mother is a union member who works at the Olympic Club with a lot of benefits, which helps them live in San Bruno and he didn’t know how they would survive without them. He stated that he goes to Sacred Heart Cathedral and he felt privileged to go there, with the support of his mother. He stated that the developer has refused to sign an agreement to be neutral and respect workers’ rights to form a union. He felt they didn’t need any low wage jobs and he asked that they say no and look for a developer who will respect workers’ rights to form a union.

Michael Delos Santos, Pacifica, stated that he works for Best Western Lighthouse Hotel and he urged the Council to vote no. He was proud to be an employee of the hotel because he is a member of a union and he feels protected. He has retirement benefits, including medical care. He stated that management has the right to kick you out but with a union, they feel protected and safe. If management kicks you out, you won’t feel protected, and he asked them to vote no.

Monica Olsen, Pacifica, stated that she is a member of Faith in Action in the Bay Area and she will be speaking about the dignity of one’s labor. She stated that inequality was undermining our country to a frightening degree, giving rise to the occupy movement, ruptured democracy in our present election system and the concept of common good is being overridden. She stated that we cannot subsidize corporations on the backs of working people. She stated that we cannot get ahead with glorious projects if we do not have honor for the labor unions.

Sallie Madriz, Pacifica, stated she commuted with her parents from their home in Oakland to San Francisco when her mom worked as a housekeeper at a hotel and to Pacifica where he
dad worked as a manager of the Shell gas station at Rockaway Beach. She stated that they had to commute back and forth until they could afford to move to Pacifica in 2001. She has lived here ever since. When she heard about the plan to build a hotel and they are only offering low wages and no union, she was stunned. She asked how Pacifica could force their residents to accept low wages or commute away from their homes. She felt, if it was not enough to support a basis standard of living for families, it is not enough. She appreciated the time her parents sacrificed commuting as they had no choice, but we have a choice now. She cares about all her friends, neighbors, classmates, and she felt they deserve good job opportunities in their city instead of having to commute far and struggling to make a living. She felt Pacificans deserved decent wages with medical benefits and pension plans, and a union to speak for them when they can’t or don’t know how. She felt we need to protect ourselves from the greed that runs this country. She urged that they say no to bad jobs, no to these developers and look for a developer who will respect workers’ rights to form a union.

Bridget Duffy, Pacifica, stated that she can’t add to what she has heard, as they have said amazing things. She loves the name, Friends. She stated that it was outrageous that the people wait to be heard, being forced to hear endless, boring presentations that do not need to be made and people leave because they are too tired to stay. She concluded that this was not listening to the people. She stated that they pay taxes and taxes pay their salaries and the government was intended to support the people which seems to have been lost somehow. She stated that a government that does not hear the voice of the people and will not respond to the voice of the people was last century’s idea of a government and we need a new century idea of a government. She stated that the time is coming that the people are going to say that they are not listened to. She stated that they vote and eventually things will change, one way or another. She stated that they can do it the easy way or the hard way.

Chito Cuellar, Pacifica, stated that he represents the hotel and restaurant workers of union local 2. He asked members of the union to stand up. He then stated that there are 100 residents in Pacifica who rely on jobs in the hospitality industry. The industry can provide good jobs and that allow them to send kids to college and stay in this very expensive area, and to give back to the communities. He added that there are bad jobs also, and can be low wage jobs, cannot afford medical benefits, no pensions and what makes the jobs good and bad was the ability to negotiate with the employer, adding that one employee against the employer is harder with not much bargaining power. He stated that the developer they are considering has made it very clear that he does not want union jobs and has refused to sign an agreement committing to respect the workers’ choice and let them decide whether they want a union or not. He stated that the choice they had was not whether or not to build a hotel but the choice was to decide whether the developer they choose will respect workers’ rights, and there are other developers who do respect workers’ rights, and he concluded that this is not the one they should pick, and he encouraged them to vote no.

Jim Heldberg, Pacifica, stated that he has a different perspective which is that he has the Segway dealership in town and has conducted over 15,000 people on the coastside on Segways and has sold hundreds of Segways in Silicon Valley and people give him a different perspective. He thought deciding who to hire for the hotel that might get built 3-4 years from now is a questioned that should be addressed 3-4 years from now but not tonight. He stated that, as he gives Segway tours to people from all over the world along Beach Blvd. And they look at the building and, as they talk about the pier and the sewer plant, and they are astounded, questioning that it is ocean front property and the city can’t figure out what to do with it. He felt the decision needs to be moved ahead quickly. He didn’t know how the decision was made to pick one developer or another but he suggested that they get going and do it now.
Dan Stegink, Pacifica, stated that the hotel workers are living large, and get whatever they want. He stated that hospitality workers are about the lowest paid benefitted union. He stated that every single staff member in the room has a union contract significantly better than any of the hospitality workers. He stated that the idea that they are going to have to deal with the labor issue was sprung on them at the last minute was false. He stated that at every single meeting on Beach Blvd., he stated that the time to affirm if it was a union hotel was now, because, if they put it off, they are essentially saying it is not going to be a union hotel. He stated that he would like to see Pacifica have some jobs that weren’t minimum wage. He stated that this property was an $11 million asset. He stated that the Starwood Aloft project offered sales proceeds of $7 million, a transit occupancy tax of $1.25 million per year. He stated that $325,000 more per year for the city than the project they are putting forth. He guessed that it was solely due to a higher quality room and higher average room rate. He stated that there are more options than saying no and yes, and he would like to see the City Council make a determination that they want it to be a union hotel as part of what they pass at this time. He stated that they can pass it and make a stipulation in the contract that it has to be a union hotel and represent hospitality workers.

Marvin Madriz, Pacifica, stated that he represented himself as a low paid worker in Pacifica for 21 years in a gas station business in Pacifica as low pay. He knows how it feels to be a low paid rate employee and he demands that Council make a decision. He stated that the people who are going to build this is fine and he approves that Pacifica needs to go up. He sees the changes and is glad that Pacifica will be on the map when they google it and they don’t see the minivan. He felt it was nice to building more for progress for our city, but he didn’t think it has to be at the cost of the employees who will be working on the project. He struggled for 21 years and the only thing that kept him going was his wife’s job which was a union job. He stated that five years ago, he changed and worked in San Francisco for a union job and he can feel the difference. He asked them to choose the developer who will respect the rights for the people of Pacifica and think about the progress but not at the cost of the people of Pacifica, the workers as they will build up the city. He stated that, if they don’t have a job that gives them dignity, they have to leave the city. He asked that they choose wisely, for the people of Pacifica and for union jobs.

Tygerjaz Bigstyck, Pacifica, stated that he has a union job but it does not pay him enough money to live here and is subsidized by his family to live here but he was looking at leaving Pacifica in about a year if he can’t find a better paying job or a living situation with someone else. He stated that finding a small studio space to live alone seemed incomprehensible to him. He stated that he did have benefits and can take care of his teeth or health, as he looks for his next step outside of Pacifica where he has worked for the last ten years and volunteering and contributing to a place where he loves living. He again stated that the union job does not pay him enough to live here. He stated that, while spending 40 hours serving the city, he won’t be able to see it because his good union job isn’t paying him enough and it would be nice if other people sharing a similar situation would be able to be paid enough so, if they are going to be serving this community, they would be able to share in its prosperity.

Mayor Digre closed public comments.

Mayor pro Tem O’Neill stated that he has talked to the unions and this was one of the toughest decision to make as the city does need the money and it was an empty hole sitting there for 14 years and an eyesore. He felt this was an opportunity to provide the city with some revenue as well as fill a hole. He stated that the history of Pacifica started when the United Airlines was the
maintenance hub and a lot of union workers who were able to buy houses and provide a living for their children. He asked if the brown field issue was taken care of in this site.

Mayor pro Tem O’Neill stated that, if the Council votes yes, they are basically saying that they are going to open up exclusive negotiations with this developer but are not selling the property, making no commitment other than to negotiate, and he felt that, to put it in terms that might be real simple, the city has been dating six developers, and now they are going to engage and get a union contract and are going to get a pre-nup before they marry them and sell the property. He stated that they will discuss something formally in order to make an agreement. He hates to let a bird in the hand disappear and he would support a yes for the developer with a provision that the city negotiators look at a card check agreement for the operations of the hotel.

Councilmember Keener thanked everyone for staying so late, stating that all of them have to go to work. He stated that this will be 120 room hotel, a Hilton Garden Inn. He stated that the consultants say it will generate 20 jobs. He stated that housekeepers are among the lowest paid people anywhere. He stated that, at $10/hour, 2000 hours per year, that is $20,000 a year per job or $400,000 a year for 20 jobs. He stated that, if you want to include benefits for someone making minimum wage, that is probably about $550,000 per year for 20 jobs. He stated that, if they bump that up $5 to $15/hour, which he thinks is slightly above the union rates at Best Western, and would be $600,000 a year for 20 jobs and about $800,000 a year including benefits. They are assuming that the hospitality workers are in a union. He stated that $250,000 a year is the difference between the $15/hour and $10/hour for 20 jobs, so $250,000 a year will pay 20 housekeepers another $5/hour. He stated that the estimated TOT from this hotel is about $900,000 which was what the consultants say, 12% of room revenue, and another $5/hour for housekeepers, it will cost the operator about 3.5% of the room revenue.

Councilmember Ervin stated that she agreed with Mayor pro Tem O’Neill. She stated that they want to win and they have the $900,000 and they have an enhanced quality of life for citizens who play and work here and people come to spend money. She felt it could enhance an area and she wants it to be great for its workers as well. She stated that she grew up in a union family. She respects what they are saying and she knows how hard it is to live in the Bay Area. She stated that her concern was that she didn’t know the reality of getting someone that will accept it. She asked how many hotels in San Mateo County that have union workers. She felt San Francisco was a different place. She wanted to get an idea of how unique or normal the situation would be.

City Manager Tinfow stated that the area represented by the convention and visitors bureau, there are a total of 171 hotels and, of that, 11 have some level of union organized service workers, and that is a small number.

Councilmember Ervin asked how many Pacifica hotels have union workers.

City Manager Tinfow stated that it is one.

Councilmember Ervin asked if that was done during the time they built the hotel.

City Manager Tinfow stated that it was her understanding that it was not, but she deferred to Mgr. Stedler as she had the conversation about that.

Economic Dev. Mgr. Stedler stated that the hotel became unionized at a point in time in its history and it was unionized by one particular owner who owned the property at that point in
time. She understood that the transition took place after the hotel had been built and was in operation.

Councilmember Ervin stated that they had six and then they had four from which they were selecting. She asked if there was any message about incorporating this check card neutrality in the stipulations.

Economic Dev. Mgr. Stedler stated that the concern the developers have at this point in time, generally, is that they are facing a great deal of risk to open and entitle this property at this point in time.

Councilmember Ervin asked the reason.

Economic Dev. Mgr. Stedler stated that it was because the property as it exists now requires entitlements at both the local level and at the Coastal Commission level. She stated that the process is long, marked by uncertainty of timing and expensive. She stated, as they said, one of the remarkable conditions of undertaking development on this site is being willing to prepay the cost of all of that work before you have even a guarantee that you have approvals or that you will have the land sold to you by the city. She stated that it is a great deal of risk for a developer to undertake.

Councilmember Ervin referred to questions about not even discussing staffing. She asked why they didn’t address staffing in their presentation.

Economic Dev. Mgr. Stedler stated that she cannot address staffing at this point in time. She understood that a select service hotel, such as the one they are recommending of 120 rooms, would be approximately 20 employees. She stated that was the best information that she has and they know that would be a range of different job classifications, including the housekeepers mentioned as well as others.

Councilmember Ervin referred to having four choices, stating that two had residential housing and two did not.


Councilmember Dev. Mgr. Stedler concluded that the primary reason for no selecting housing as part of the criteria was that the Coastal Commission did not advocate for housing.


Councilmember Ervin thought there was another issue with Moffat & Nichol where they were concerned about having residential there, more so than hotels, as it was different.

Economic Dev. Mgr. Stedler stated that there was a relationship between hazard and land use that was important where they know that commercial properties addressed coastal hazard risks differently than a homeowner might be able to address that risk. They talked about that in one of their earlier meetings. She stated that the other issue they discussed was the alignment of the hotel with the city goals of anchoring Palmetto, supporting the hotel industry within the city of Pacifica and lastly generating transient occupancy tax. She stated that all of those can be accomplished with a hotel as opposed to a residential development.
Councilmember Ervin thought it was interesting that all four of them had a relatively equal number of rooms, but the residential aspect was another 50 or 60 residential units, and it was hard to imagine where they would all go.

Economic Dev. Mgr. Stedler stated that it creates more density on the site and the point they made today has to do with permitting and the complexity of the process of delivering a multi-use project. The point they wanted to communicate earlier was that every aspect of a property may become more difficult in terms of planning for it, marketing for it, securing the financing for both of the uses at the same time. She stated that the reason that was important to them was that the goal was to deliver the hotel. She stated that, if they complicated so the approval process or the building and development process was more complex and longer, they defer that ultimate goal. She stated that there was one other point she thinks it is important to make which was that the RFQ that they released in October 2015 at the Council's request was an RFQ that stated that they were looking for an ocean front hotel and inside the document they talked about the fact that the city's intent was to select a hotel developer and was not to solicit for housing at that point. She stated that they indicated in the RFP and discussed with the developers that they were proposing. She stated that their record has been clear in that regard.

Commissioner Ervin concluded that they requested a proposal with no housing.

Economic Dev. Mgr. Stedler stated that their intent was to select a hotel developer with a transformative vision and excellent qualifications who can deliver a destination hotel.

Councilmember Keener stated that the project was very appealing and he thought they have done a good job in winnowing the various applicants down and bringing it to Council, but he would like to see the lowest paid workers among us paid a little bit more.

Mayor pro Tem O'Neill stated that they were deciding at this time whether they are going to move forward in negotiations. He asked if she was saying that they are open to saying yes to the developer with the provision that there is some sort of organized card check for the workers. He said that in the beginning. A no vote would be that they stop and state they are not interested in working with the developer at all, and that would get them back to October of 2015 and start the process again. He stated that, if what he suggests passes, it would be that they move forward with this developer with the provision that there is some negotiation for workers and higher wages. He asked if Councilmember Keener was supportive of that or did he want to say no to the developer.

Councilmember Keener stated that he did not want to say no to the developer, but he did not think that what he wants is attainable by this body. He thinks that it is attainable by the union negotiating with the developer, not the Council.

Councilmember Ervin agreed with Mayor pro Tem O'Neill that, during negotiations, they work on negotiating for the fair wages.

City Manager Tinfow stated, if it was something the developer was not willing to consider, she was not sure what the path forward was. She wasn’t asking for them to give her that direction at this time, as they will have the conversation with him, but she was not sure, if that was the case, she wasn't sure where that will leave them.

Mayor Digre told the audience that it was late and she stated that they were talking about dignity and she asked that they keep this as dignified as possible. She stated that they won't always
agree but she asked that they be as dignified as possible.

Mayor pro Tem O’Neill thought this was like the rubber hitting the road. They were doing the exclusive negotiating agreement. He thought they have gone this path with this developer, and he thought, if they lay out the terms of what they want now, they should give them the chance to respond as they are into them for a year now, stating that the RFQ went out in October of last year. He would like to give the developer the opportunity to make a decision with the reality in front of them. He stated that, if they choose to say no, they will discuss that in closed session. He responded to someone and stated that it was property negotiations and he thought it would be closed session. He stated that they would have to discuss it at that point. He stated that he would like to hear what the Mayor has to say.

Mayor Digre stated that she was trying to keep the rebel in her sane and sensible. She liked what she heard from the developer until she remembers that we have people displaced and she was distressed with that and skyrocketing rents. She stated that wages have to be decent enough or the people who are going to work there will have to move somewhere else to live or busing themselves in. She understands and wanted to get to the point that is bothering her. She stated that we are an ocean front and we had a very good developer at one time, waiting four years, and nothing came out of that. She stated that they have been through 16 years, but she stated a lot of that was the economy as there were other people who wanted to do things here. She was inclined to be in favor of whatever the community feels that it wants, and they don’t want to be displaced but a living wage. She stated that they just had Labor Day and she was involved in labor issues. She realizes that they are taking a risk and paying a lot of money for things, but it bothers her that we have to feel like we are so poverty stricken that we will take and grovel for whatever we can get. She stated that another part of her says we are in that position and we do need to grovel. She was understanding revenue and how we need it, and she was not at the point where she doesn’t feel like she is selling her soul. She wants the revenue so the community can pay for potholes and will be an enticement to other people to do more on Palmetto, but her other side says we have good stuff here and there must be somebody that will do it, and she didn’t think this pushes what is going on with Palmetto. She stated that, whatever direction she goes, she can be totally wrong, but she will go with what she feels. She stated that the developer has great stuff and says great stuff and wants to be what the community and reflect the community, and she feels that she is tied up with skyrocketing rents and displacement of our community which bothers her every day. She feels that this is just another leg of that and she was inclined to say we put our foot down and see where we go and not have to follow the other ways of feeling like you are threatened if you don’t do it that way. She asked if she made sense.

Councilmember Ervin stated that, as a Council, their primary goal was to improve our economy and our second goal was to develop the Beach Blvd. Site and she felt we need to be very careful of what they are saying no to. She stated that the more money we have as a city, the more we can help those who need it. They can assist and fill pot holes or take care of those who need the Council to help them. She stated that they had six candidates, then to four, and basically down to none and they would be starting over if they stand firm and the city stands firm. She likes the idea of negotiating and letting them know that it is important to us, but having it a negotiating element but not a do or die situation. She asked if they could get other better living wages and instill upon them on how important it was to them as a city to pay fair living wages to our community and take the step to get on the map as a place where people want to go and they will come back and the city can demand more as they will have more here. She stated that there are only 11 out of 174 hotels in San Mateo County. She felt they can do it together but they have to do it at a pace that is affordable or they won’t have any jobs for
anybody.

Mayor Digre asked the audience, stating that this was our American democratic process. She asked if anyone has answers.

Councilmember Keener stated that a no vote doesn’t mean this process is over. He stated that the developer has not been tested with adversity in this regard. He stated that maybe he or she will find a way to live with 3.5% or 5% or maybe not. He didn’t know, but what he thinks is that, if they vote yes, they will not get good paying jobs but rather $10/hour.

Mayor pro Tem O’Neill stated that he will make a motion to see what happens, if there is a second, and move on.

Mayor pro Tem O’Neill moved to approve the selection of recommended development team, James H. Friend of Friend Development Group, based on the proposed hotel and restaurant concept submitted for 2212 Beach Blvd. And authorize the City Manager to prepare an agreement to negotiate exclusively with the selected developer for subsequent City Council review and approval, and take all necessary steps to do so with the amendment that they meet with the union to discuss organization. He asked the City Attorney to help him out with that language.

City Attorney Kenyon asked if he could describe further what he was asking for, stating that she has heard different thoughts coming from them.

Mayor pro Tem O’Neill understood and he was saying to get things going. He stated that he wants to move forward with the developer, with whom they are in for a year and a half, and they want employee representation of some kind.

City Attorney Kenyon asked if he was giving staff direction in negotiations.

Mayor pro Tem O’Neill responded affirmatively.

City Attorney Kenyon asked if he was giving staff direction to talk to the developer with that directive in mind and they will bring back their response to Council.

Mayor pro Tem O’Neill agreed, clarifying that, if the developer moves forward, they have union rights, their labor rights.

City Attorney Kenyon concluded that he is making the motion with a proviso that he was also directing staff to convey the Council’s intent to demand union representation and to negotiate that with the developer and bring the results of those negotiations back to the Council.

Mayor pro Tem O’Neill responded affirmatively, adding that was his motion.

Mayor Digre stated that, if they vote on that, it was not committing them in any way to the developer or vice versa.

City Manager Tinfow stated that it was indicating that they would like staff to move forward with conversations with the Friend Development Group and then have the negotiations include discussion of the city requiring them to have union represented workers. That is what she understood the motion to be.
Mayor pro Tem O’Neill clarified that one of the conditions of the project is that they have union representation. They can still move forward and not start from square one again.

City Manager Tinfow stated that if they agree, that would be the case.

Mayor pro Tem O’Neill stated that, if they don’t agree, they start from square one.

Mayor Digre stated that part of the problem is that the community at large does not know some of the things we know. She asked that people keep calm because it was not easy making decisions. She stated that they are trying to think of 38,000 people and the future of each of them and be sensitive to everyone. She stated that there is risk whichever way they go, of things totally collapsing and bombing out, and everyone being poor as church mice. She stated that, if she was hearing it correctly, they were requesting union workers and, if they say no, they start all over.

City Attorney Kenyon stated that they will bring it back to the Council for discussion.

Mayor Digre stated that it leaves another doorway for them to be where they are today. She stated that she doesn’t have a problem with that because she thinks the plan is something that the Coastal Commission would approve and she was not against the Coastal Commission, stating that they were voted on by the people of California for those things. She thinks that the public needs to be more engaged in what they do and then they wouldn’t be having as much of an impasse and she thought it was a good thing.

Councilmember Ervin seconded the motion. She added that she wanted to make something clear, and she knew it was hard to hear and understand. She stated that there are sometimes decisions they make and would make a different decision if they were speaking for themselves, but they are speaking on behalf of 38,000 and the benefit to all community members as a whole and do it the right way to benefit all Pacificans. She stated that they were trying to find the space to do that, trying to make sure that people are paid fair wages but at the same time, they get a project that could improve the city’s standings, so it was not so risky to come to Pacifica to put a hotel there, but a project more people will want to do and they can negotiate and have stronger power to negotiate a better contract for everyone.

Councilmember Keener thought the union and developer should speak directly to each other rather than having the city in the middle. He thought that would bollix up the works completely.

Mayor pro Tem O’Neill stated that he does not disagree with what he was saying. He does think it was their place to do it, but he understood that he has refused to meet with them many times over the past couple of months. He stated that they were saying the terms of sale and they want to talk, but at that point they facilitate a meeting between the union and the developer of the hotel.

Councilmember Keener thinks he is following what he was saying, and he also appreciate his making the motion, but he thought the end result will be the same, in the sense that the developer still says no, then they were back to square one and searching for another developer. He stated that, if the developer says yes to the union, then they are great and they can move forward, but having a third party in the room, to him, begs for mixed messages, poor communication, etc. He would not support his motion, although he thought it was pretty good.
City Manager Tinfow reminded them that the negotiation was between the city and the developer. She stated that the developer could talk to the union, but the provision of the requirement is what would be in the city’s agreement with him if he chooses to agree to that and then how that gets implemented they would work out. She reiterated that the negotiation was between the city and the developer at this point. They would need to be at the table and party to the conversations.

Mayor pro Tem O’Neill stated that he was going to clarify with the City Attorney, who had mentioned that there was a certain individual in her office that handles real estate negotiations and he was sure this individual has done this type of real estate many times, if not this particular situation, and he thought this was something he would approach the developer with, hopefully sell the sizzle and the steak.

City Attorney Kenyon agreed, stating this would be one of many terms on which the city would be negotiating with the developer.

Mayor pro Tem O’Neill agreed with Councilmember Keener that once the negotiator for the city tells them the terms of our sale, then the city would be out of the picture and the negotiations between the union and the developer were their business. He stated that they had a motion and a second.

Mayor Digre repeated that they are deciding to add a requirement that the developer have union involvement.

City Attorney Kenyon stated that they are giving direction to staff to negotiate that term with the developer. They will bring back to them the results of those negotiations.

Mayor Digre was okay with that and she called for the vote.

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**ADJOURN**

Mayor Digre adjourned the meeting at 12:14 p.m

Transcribed by Barbara Medina, Public Meeting Steonographer.

Respectfully submitted,

Kathy O’Connell, City Clerk

APPROVED: 9/26/16; 5-0

Sue Digre, Mayor
SUBJECT:
Approval of Disbursements for 08/03/16 through 08/31/16

STAFF CONTACT:
Lorenzo Hines Jr., Assistant City Manager
(650) 738-7301
lhines@ci.pacific.ca.us

RECOMMENDED ACTION:
Move to approve attached list of disbursements for 08/03/16 through 08/31/16.

BACKGROUND/DISCUSSION:
Staff has submitted the following disbursements for Council approval:

Disbursements dated 08/03/16 through 08/31/16 in the amount of $1,615,952.29. As written on regular and manual checks numbered 35135-35140, 35210-35240, 35298-35322, 35335-35350, 35380-35565 (Attachment 1). These disbursements are for Fiscal Year 2016-2017.

Disbursements dated 08/03/16 through 08/26/16 in the amount of $766,195.74. As written on regular and manual checks numbered 35141-35209, 35241-35297, 35323-35334, 35351-35379 and 82252 (Attachment 2). These disbursements are for Fiscal Year 2015-2016.

FISCAL IMPACT:
These disbursements are within budgeted appropriations.

ORIGINATED BY:
Finance Department

ATTACHMENT LIST:
Disbursements 35135-35140,35210-35240,35298-35322,35335-35350,35380-35565 16-17 (PDF)
Disbursements 35141-35209,35241-35297,35323-35334,35351-35379,82252 15-16 (PDF)
### Total # of Unissued Checks: 0

### Total # of Issued Checks: 6

### Total # of Voided/Reissued Checks: 0

### Total Amount: $148,172.46

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### Total # of ACH Checks: 0

### Total Amount: 0.00
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ALBERTSONS / SAFEWAY
AT&T MOBILITY
CAPITAL ONE COMMERCIAL
COASTSIDE TILE
FIRST NATIONAL BANK OF NORTHERN
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FIRST NATIONAL BANK OF NORTHERN
FIRST NATIONAL BANK OF NORTHERN
HOME DEPOT CREDIT SERVICES
KBA DOCUSYS
NORTH COAST COUNTY WATER DIST.
O'REILLY AUTO PARTS
ORCHARD SUPPLY HARDWARE
STEPFORD INC.
TORRES CLEANING SERVICE
U.S. BANCORP EQUIPMENT FINANCE,
VERIZON WIRELESS

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TOTAL AMOUNT:

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TOTAL # OF VOIDED/REISSUED CHECKS:

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TOTAL AMOUNT:

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TOTAL # OF ACH CHECKS:

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TOTAL AMOUNT:

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TOTAL # OF UNISSUED CHECKS:

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BENEFIT COORDINATORS CORPORATION
BENEFIT COORDINATORS CORPORATION
CALIFORNIA ASSN OF PROFESSIONAL FIREFIGHTERS
CLEA
MICHELLE L DOMINICI
P.E.R.S.
PACIFICA FIREFIGHTERS UNION
PACIFICA POLICE OFFICERS ASSOCIATION
PACIFICA POLICE OFFICERS SAVINGS
PACIFICA POLICE SUPERVISORS ASSOCIATION
PREFERRED BENEFIT INSURANCE ADMINISTRATORS
TEAMSTERS LOCAL #350
TEAMSTERS LOCAL #856
TEAMSTERS LOCAL #856
TEAMSTERS LOCAL 856
VISION SERVICE PLAN-CA

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TOTAL AMOUNT:

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TOTAL # OF VOIDED/REISSUED CHECKS:

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TOTAL AMOUNT:

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TOTAL # OF ACH CHECKS:

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TOTAL AMOUNT:

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TOTAL # OF UNISSUED CHECKS:

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GENERATED: 05 FEB 15 19:33

RUN: FRIDAY SEP092016 09:28

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A-1 RHINO LININGS
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OUTSTANDING
ALHAMBRA
OUTSTANDING
ALL STAR FIRE EQUIPMENT INC.
OUTSTANDING
AMERICAN FIDELITY ADMINISTRATIVE SERVICES LLC OUTSTANDING
AMERICAN MESSAGING
OUTSTANDING
AQUA SCIENCE
OUTSTANDING
ARAMARK
OUTSTANDING
ASSOCIATION OF BAY AREA GOVERNMENTS
OUTSTANDING
AT&T
OUTSTANDING

Packet Pg. 34

http://gems-websvr/fms/BISystem/ReadROCFile.asp?sWC=C&iIdx=&FileName=C:\GEMSEnvisi... 9/9/2016

Attachment: Disbursements 35135-35140,35210-35240,35298-35322,35335-35350,35380-35565 16-17 (2023 : Disbursements - Dated 08/03/16

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$148,172.46 + $44,205.98 + $25,316.12 + $235,780.61 + $1,162,477.12 = $1,615,952.29
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PAGE 6

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PAGE 7

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Total for FY 15/16
$236,383.25 + $242,485.06 + $2948.97 + $281,378.46 + $3000.00 = $766,195.74
SUBJECT:
Approval of Minutes

RECOMMENDED ACTION:
Move to approve the minutes of the special City Council meeting held on August 8, 2016 and the regular City Council meeting held on July 25, 2016.

BACKGROUND/DISCUSSION:
Approval of minutes of regular City Council meeting held on August 8, 2016.

FISCAL IMPACT:
None.

ORIGINATED BY:
City Clerk

ATTACHMENT LIST:
Minutes of August 8, 2016. (PDF)
Attachment: Minutes of August 8, 2016. (20122 Approval of Minutes)

CITY OF PACIFICA
CITY COUNCIL MINUTES

Council Chambers
2212 Beach Blvd
Pacifica, CA 94044

Mayor Sue Digre
Mayor Pro Tem Mike O'Neill
Councilmember Karen Ervin
Councilmember Mary Ann Nihart
Councilmember John Keener

August 08, 2016 (MONDAY)
www.cityofpacific.org

Mayor Sue Digre called the meeting to order on August 8, 2016 at 7:00 PM

6:30 PM CLOSED SESSION.

Mayor Digre called the meeting to order at 6:30 p.m., stating that all councilmembers were present and announced that the Council would meet in Closed Session. City Attorney Kenyon announced the business to be discussed.

PURSUANT TO GOVERNMENT CODE SECTION 54957.6 Conference with labor negotiator. Agency negotiator: Janet Cory Sommer. Employee organizations: Pacifica Firefighters Local 2400; Teamsters Local 856 Battalion Chiefs; Department Directors Local 350; WasteWater Treatment Plant Employees Local 856; Miscellaneous Local 856; Managers Local 350; Police Officers Association; Police Supervisors Association; Police Management Local 350.

7:00 PM OPEN SESSION

Call to Order

Mayor Digre reconvened the meeting at 7:05 p.m.

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<tr>
<td>John Keener</td>
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Staff Present: Lorie Tinfo, City Manager; Kevin Segal, Acting City Attorney; Van Ocampo, Public Works Director; Tina Wehrmeister, Planning Director; Robert Smith, Assist. Planner; Dan Steidle, Police Chief; Rich Johnson, Deputy Fire Chief; Econ. Dev. Mgr. Stedler; Mike Perez, PB&R Director; Kathy O'Connell, City Clerk.

Salute to the Flag led by Mayor Digre

Closed Session Report

Acting City Attorney Segal stated there was no report.
SPECIAL PRESENTATIONS

None.

CONSENT CALENDAR

Councilmember Nihart asked if they had an ETA on the body cams.

City Manager Tinfow stated that they will be bringing a policy forward on that and then implement that. She stated that she didn’t have a date but would get back to them with more information.

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<td>AYES:</td>
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1. Approval of Disbursements for 07/14/16 through 07/28/16
   **PROPOSED ACTION:** Move to approve attached list of disbursements for 07/14/16 through 07/28/16.

2. Approval of Minutes
   **PROPOSED ACTION:** Move to approve the minutes of the special City Council meeting held on July 21, 2016 and the regular City Council meeting held on July 25, 2016.

3. Review of the City of Pacifica’s Conflict of Interest Code
   **PROPOSED ACTION:** Move to direct the City Manager to review the City of Pacifica’s Conflict of Interest Code and prepare recommendations to update the Code, if necessary.

4. A Resolution of the City Council of the City of Pacifica Approving a Subdivision Improvement Agreement and a Grant of Storm Drain Easement, Sanitary Sewer Easement, and Access Easement for the Condominium Subdivision of 1567 Beach Boulevard.
   **PROPOSED ACTION:** Adopt a Resolution approving the Subdivision Improvement Agreement and the Grant of Storm Drain Easement, Sanitary Sewer Easement, and Access Easement, for the condominium subdivision at 1567 Beach Boulevard, and authorizing the City Manager to execute the agreements and accept the dedication of the easements.

5. Response to the San Mateo County Grand Jury Report "Body Cameras - the Reel Truth"
   **PROPOSED ACTION:** Move to approve the response to the Grand Jury report and authorize the City Manager to send the response to the May 24, 2016 San Mateo County Grand Jury Report, "Body Cameras - The Reel Truth"

ORAL COMMUNICATIONS

Brent Ritz, Pacifica, stated that in July he had received a disturbing email from Mike Bell and he was requesting that they put an agenda item to investigate Councilmember Keener’s actions.
He read an excerpt from the email, which was on the subject of Councilmember Keener supporting managed retreat on land west of Highway 1. He felt that the Council needed to protect all citizens and property and work together as a unified body. He stated that there was a lot of furor in the community and he would like the Police Chief to bring it to the city attorney and do some discovery on this.

Erin Macias, Pacifica, stated that she was addressing the absence of the issue of illegal fireworks in Pacifica from the Council agenda. She mentioned the information in the police report and the problem with the current ordinance language. She stated that they were asking for the reinstatement of the task force so they can be a part of the solution. She asked that they move forward with this issue and work diligently to move it onto the agenda rather than have it pushed off until the next 4th of July as they need time and energy to resolve the problem. She stated that the public was willing to volunteer their time to assist and she asked that they work with them and agendize this issue.

Kelly Bogdanov, Pacifica, read a letter by Congresswoman Jackie Speier to the US Army Corp of Engineers Coastal Sediment Management Working Group dealing with the issues concerning coastal erosion. She stated that, while it wasn't addressed to Council, she asked that the Council heed her instructions as it relates to West Sharp Park and public and private assets in need of protection. She stated that it was time to examine federal and state funded solutions to replace the retaining wall north of the pier with a properly built seawall.

Zee Hussein, Pacifica, stated that she was going to work as a group in their presentation. She stated that she was a program coordinator with the non-profit Youth Leadership Institute, based in San Mateo, but worked with young people throughout San Mateo County. They were working in Pacifica now on financial and economic security, working with youth from Oceana and Terra Nova. She stated that they have been doing it in Daly City and South San Francisco and were now in Pacifica, focusing on the harmful effect of Pay-Day Lenders on the community.

Fudda Ababseh, Pacifica, stated she was a student at Terra Nova. She stated that, after working with the Youth Leadership Institute, she has learned about the negative impact of Pay-Day Lenders on Pacifica residents, mentioning some of the problems they create for people who are not fully informed, such as being trapped into debt with student loans for college.

Sara Ababseh, Pacifica, stated she was a student at Terra Nova. She stated that they have met with Mayor Digre and City Manager Tifnow and hoped to connect with the other Councilmembers individually to talk more about their project.

Rhonda Johnson, Pacifica, stated she was a resident in Sharp Park and has attended meetings listening to fellow residents and experts about the Beach Blvd sea wall and sea level rise. She felt there was no reason that the Council should not have an agenda item to move forward to seek federal funding for replacement of the sea wall. She mentioned that they learned that it was never a sea wall but a retaining wall, and she felt there was no reason not to move forward and invest in a sea wall for the community. She asked that they take the next step and put it on the agenda to vote for seeking federal funding to replace the present sea wall.

Mike Bell, Pacifica, stated that he surveyed the entire West Sharp Park neighborhood, between Highway 1, Beach Blvd, IBL and Sharp Park golf course. He stated that, according to Mr. Keener's failure analysis report, there are 7,200 people or 19% of Pacifica's population who live and work in this area, detailing the number of various living units, hotels, businesses, etc. He then mentioned what would be required to remove all those facilities from the area, and the
huge cost which would destroy Pacifica. He asked why only 3 Councilmembers were opposed to this destruction described as managed retreat.

Robby Bancroft, Pacifica, stated that he has joined the board of the Pacifica Resource Center and the director sent him on her behalf. He was present to invite everyone to the Resource Center relaunch which the Council has been part of and supportive of. He mentioned their recent efforts with a Back to School program.

Bridget Duffy, Pacifica, stated that she has heard of managed retreat and that it was causing a lot of oppositional language. She stated that she knew there was a lot of money put into developing the area. She stated that there was new science available now that we didn't have even five years ago. She stated that, if we put millions of money into the area, it will depend on us building a better sea wall. She stated that, when they do that, they will effectively lose the beach. She stated that we can rethink this without people losing. She stated that a managed retreat can take decades and was not an abandonment of the shop owners. She stated that it could be a brilliant way for people to prosper and they aren’t prospering now. She stated that, with the information on rising ocean and changing climate and the risk to this area, it made sense to rethink it. She thought it would be a responsible mature thing to do as a government. She mentioned that people were asking the city attorney to look into a flyer implying that, if you signed it, you would be saving the quarry from development, but it was actually gathering signatures to put it on the ballot to allow the development of the quarry, the opposite of its seeming intention. She stated that the city attorney was asked to look into this and give the residents an explanation, as they are going to put the ballot measure together and she asked that Council look into it.

Toni Boykin, Pacifica, stated that she was disappointed that she felt she has to be present, stating that it was about fireworks not being on the agenda and the discussion of a task force was not on the agenda as they expected it to be. She stated that there was direction given to do that but it hasn’t happened and she was very disappointed.

COUNCIL COMMUNICATIONS

Mayor pro Tem O’Neill stated that, if anyone wants to see what the castle looks like inside, they were having tours by the Historical Society Saturday and Sunday. He congratulated Asst. City Manager Hines and staff because Pacifica’s credit rating was raised to AA- and he thought that was a big achievement given the city’s circumstances these past years. He thought Asst. City Manager Hines was the lead on this.

City Manager Tinfow stated that he has been working on the COP process and that was how this came out, so she agreed that he was the lead on it.

Mayor pro Tem O’Neill stated that he wanted to share that with everyone.

Councilmember Nihart stated that she wished there was more good than bad to report, and she will end with the good. She then reported on the grade separations along the area of the high speed rail, stating that we have more to do than we will ever have funds for at this time, with very limited funds from the state. She added that they didn’t know what will happen when the state comes back into session in terms of transportation dollars. She also felt she will be hearing the same things from CCAG next month. She wanted to comment on this because there are problems with understanding how funding works, stating that it was because it was complex. She stated that 70% of the dollars from the state are associated with priority
development areas. She referred to comments about why Pacifica didn't apply for certain grants or funds. She stated that we didn't have a priority development area and were not eligible for some of the funds. She explained that 11 cities compete for 70% of the dollars and the other 9 cities compete for 30%. She stated that was why it was important to think about planning as a whole with transportation and housing together, and they were involved at the county level to do those kind of things, as well as regionally on ABAG. She congratulated the Resource Center, adding that she was impressed with the tours she has had. She also mentioned Pedro Point having their chili cookoff on the 14th and they wouldn't want to miss it as it was an outstanding event. She referred to Asst. City Manager Hines getting a lot of credit on the credit rating, but she stated that a lot of that work comes the way our finances are organized and laid out. She mentioned that from the time she was first on Council until now, everything is so much clearer and easier to track. She also mentioned that since City Manager Tinfow came on, she didn't think there was anyone left in finance.

City Manager Tinfow stated there was one person.

Councilmember Nihart stated that everyone has changed over, records had to be found, with hours spent unearthing how the finances were laid out. She thought it was sad that the bearer of news gets blamed for the news, and she felt that has happened to some extent. She appreciated that they received the AA credit rating and she wanted to make sure the City Manager publicly gets a thank you from Council as she started the process and has been an exceptional leader, mentioning staff morale, etc.

Councilmember Keener stated that he would like to see the Fireworks Task Force be agendized. He stated that he and Mayor pro Tem O'Neill have requested it before. He would appreciate it managed as soon as possible. He attended the Peninsula Clean Energy Board Meeting. He stated that some people should be getting notices of the switch from PG&E to Peninsula Clean Energy, but as it is only electrical, the billing will remain with PG&E along with gas. He explained that they had two products, giving the details of what is being offered and your options. He stated that they had discussions of how to bill for rooftop solar and he explained what the process would be for those with rooftop solar.

Councilmember Ervin also praised staff for what they have done to raise Pacifica's credit rating. She thought it was significant and meaningful to her on why they were underscoring the reasons for this credit rating, which was largely due to management's changes. She asked how much this was saving the city annually.

Planning Director Tinfow stated that the additional amount just from the credit rating was a little over $400,000.

Councilmember Ervin thought that was very important to our city and very meaningful. She thanked the firefighters as many have been serving in many of the fires across the state. She felt the city was blessed to have the staff we have in the different departments and she thanked them for their dedication and service to Pacifica and California. She stated that she attended the new Library Advisory Committee as liaison with Mayor pro Tem O'Neill. She felt it was an eye opening discussion about possible design features of the new library and what they want to see in a new library. She stated that they will be hearing about the discussions, but she urged people to attend the meetings to get information on the plans. She attended the Beautification Committee meeting and she thanked them for all the work they do. She mentioned that community members are adopting sites, mentioning that there were about 22 sites in Pacifica needing adoption. They discussed Highway 1 and talking about adopting it. She stated that
they are working hard at trying to get some of the highway cleaned up. She stated that, on the following Thursday, she will be attending the legislative committee meeting with Councilmember Nihart where they hear about all the statewide issues.

Councilmember Nihart stated that she was thrilled about what Councilmember Keener was talking about, adding that as an early adopter it was easy to go on line. She was thrilled about rooftop solar. She stated that PG&E doesn’t give you what you think you are going to get and she was happy about them. She mentioned that it takes a little while to write an ordinance, but she suggested that they split the ordinance and the task force for fireworks, adding that they had given direction about the ordinance and they could split the two and people can feel like it was still moving forward as she knows it is. She forgot to mention commute.org which has done some really good things. She stated that one was the trip tracker that was now available for employers, such as public or alternative transit mechanisms to track the trip, keep scores, earn chits and get rewards for it. She stated they should focus on how they can use alternative mechanisms as they are off the beaten path and yet so close.

Mayor Digre stated that she was grateful for our firefighters who were in two different fires and was happy that they were safely back. She felt the credit rating was very valuable and even more valuable than finances with the books was that both city manager and asst. City manager are good at publicity and marketing it. She stated that, if it was only on paper, it takes an astute person to see all the ramifications. She felt that talking about all the assets and potential of Pacifica was extremely valuable. She referred to the regular Economic Development meeting which has been meeting in various places in town, and it will next be at the ChitChat in Manor the following night at 6:00. She referred to the comments during orals, which they cannot respond to but they are on the minds of staff and the Economic Development group. She mentioned that things can’t always happen immediately. She thought the idea of separating the task force and the ordinance will speed things up. She stated that the fireworks situation was extremely important to Council, but they appreciate the fact that the public comes and expresses themselves. She stated that they don’t have another Council meeting until September 12, the day after 9/11. She mentioned that some may realize that it was 15 years and 9/11 is also Patriot Day, mentioning that many people across the country rose to the occasion and became supportive of one another. She also mentioned the young citizens who joined the services to put themselves in harm’s way to ensure that those things don’t happen. She expressed sorrow as well as gratitude that the communities in the nation care. She stated that Mozzetti closed, stating that there was a wedding for one of the girls and the bakery will be going on for many more years to come.

Councilmember Nihart asked if they had a date for the study session.

City Manager Tinfoy asked if she was asking about the sea level issue.

Mayor Digre stated that they were trying for the 22nd.

Councilmember Nihart stated that the CCAG water committee starts on the 17th.

**STAFF COMMUNICATIONS**

City Manager Tinfoy stated that the police chief will be back before November 30 with a plan for the body worn cameras. They have committed to full implementation by next October.

Mayor Digre asked clarification that it was the police body cameras.
City Manager Tinfow confirmed that it was the police officers’ body worn cameras. She stated that the report on the illegal fireworks task force was scheduled to come back to Council on September 26. She explained that the delay was not because they didn’t get the direction but the body worn camera report and the massage ordinance were both prepared by the police department for this meeting and there are only so many hours. She stated that she spoke to the Police Chief and it will be coming back on the 26th. She stated that the sea level rise study session dates did not work out and she was checking with the staff on dates, which will most likely be the first two weeks in September. She stated that, as soon as she gets confirmation from them, she will check with Council on their availability and she stated that she will publicize that as soon as it gets set as there is a lot of interest from many people. She thanked Council for their kind words related to the credit rating upgrade. She stated that they all appreciate it, but she added that Council deserved the praise as well because, without their leadership and guidance since she has been here, they would not be able to achieve this and she hoped they took it to heart as they deserve as much credit as the staff.

PUBLIC HEARINGS

6. Introduction of an Ordinance Repealing Existing Chapter 19 and Enacting New Chapter 19 (Massage Businesses) to Title 5, Public Welfare, Morals and Conduct; and Introduction of an Ordinance to Amend Chapter 4, Title 9, Permitted and Conditional Uses in the C-1, Neighborhood Commercial District of the Pacifica Municipal Code.

PROPOSED ACTION:

1) Move that the ordinance entitled “An Ordinance of the City Council of the City of Pacifica Repealing Existing Chapter 19 and Enacting New Chapter 19 (Massage Businesses) To Title 5, Public Welfare, Morals and Conduct, of the Pacifica Municipal Code, Relating to the Regulation of Massage Businesses” be read by title only and that further reading be waived; and,

2) Move that the ordinance for Amendment to Chapter 4 of Title 9, Article 10 of the Pacifica Municipal Code, Relating to Permitted and Conditional Uses in the C-1, Neighborhood Commercial District of the Pacifica Municipal Code be read by title only and that further reading be waived; and,

3) Move to adopt a resolution amending the City of Pacifica Master Fee Schedule to reflect changes to fees related to massage therapy permits.

Police Chief Steidle presented the staff report. He stated that he would turn it over to Asst. Planner for the amendment to Title 9.

Planning Director Wehrmeister stated that she was introducing Rob Smith, Asst. Planner, who has been with them for several months but this is his first presentation to the City Council.

Asst. Planner Smith continued the staff report.

Police Chief Steidle completed the staff report.

Councilmember Keener thanked them for the report and collaboration with members of the community which he felt may be normal practice but was welcomed. He referred to the square
footage of the minimum treatment area and asked if that meant to be a certain number of rooms or something else.

Asst. Planner Smith stated that to determine the threshold by which a use permit was required, they looked at the requirement for the individual size of a treatment room. He explained that, through the California building code, the appropriate size to measure from was emergency treatment rooms, having similar types of facility. He stated that the 640 square foot threshold would allow five rooms and take them into the bracket of parking space standards of two spaces for that size of unit.

Councilmember Keener asked if two spaces would be required for under 640 square feet.

Asst. Planner Smith stated that, if they apply the standards that currently exist in the zoning code, one space was required for 300 square feet, and three rooms at 360 square feet would be the first parking space, and the second parking space was at 600 square feet.

Councilmember Keener asked if that will be in the new ordinance.
Asst. Planner Smith stated that, with the text amendments, as soon as they hit the threshold for a use permit, and if a unit was over 640, the parking standards would apply.

Planning Director Wehrmeister stated that, initially, staff’s recommendation was to remove the use permit requirement for any size massage establishment. It went through two hearing rounds at the Planning Commission. She stated that Planning Commissioner Chuck Evans was present as a liaison if there are any questions for him. She stated that the Planning Commission was concerned that there still may be some land use impacts from a very large day spa. She stated that they often go into commercial centers and, when you start to get larger, you may be impacting many of the parking spaces that the shops use, particularly if customers may stay longer than typical if it was a day spa with other amenities. She stated that the Planning Commission sent them back to do some homework, and they wanted to come back with something objective without just throwing out the number of treatment rooms. They looked at the square footage and at about 640 square feet the scale tips and it starts to get more parking intensive than typical retail space, which was their rationale.

Councilmember Keener asked clarification that, under 640 square feet, no additional parking was required and over that, the parking regulations start taking effect.

Planning Director Wehrmeister stated that over 640, you need a use permit and they can study that, and there was no parking change. She added that any size massage establishment still needs to register with the police department regardless of the size.

Councilmember Ervin referred to the 10 massage therapists who helped provide input in the report, and asked if they approved it in the end and were happy with it.

Police Chief Steidle stated that it seemed to be that way, mentioning that there were several questions that came up and they were able to address all the issues they had. He stated that, as late as the past week, they had the final version with only one additional question asked, and it was answered.

Councilmember Ervin agreed with Councilmember Keener that it was wonderful that they were able to work together and come up with something that everyone can live with which protects
the citizens and community. She referred to the issue of privacy, and asked if it was just the front. She mentioned that people remove clothing and she asked if it was the front window.

Police Chief Steidle stated that it was just the front window and being able to see into the lobby area.

Councilmember Ervin asked if they were still able to have a private massage in the backroom.

Police Chief Steidle responded affirmatively.

Councilmember Nihart stated that it was so improved and she was happy. She referred to the square footage, stating that we had some established places in town that would go over the 640 quickly but they don't have that many rooms. She stated that some do a lot of other things and it would put them in a use permit anyway. She asked for some square footage.

Planning Director Wehrmeister asked if she was asking about each treatment room.

Councilmember Nihart stated that the 640 was the square footage before the parking applies and they have to do a use permit.

City Manager Tinfow thought it was 20 x 30.

Councilmember Nihart thought it was a few that could share a space and still need a use permit. She preferred not having to go that route since other like businesses that are therapeutic in nature do not go that route, but she will see how it goes. She mentioned that she has voted on massage three times, and it was getting better. She referred to the practical matters. She stated that she has both an RN and NP, and the state of California gives the license and she has to show them on an airplane when she administers care, but she doesn't have to have them on her body physically. She thought about the idea of having tags hanging, and she asked how they talked about that. She thought it seemed so bizarre.

Police Chief Steidle stated that, in looking at examples, the most common one he has seen is the massage therapy counsel card with the number on it with a clip to clip it on the clothing. He stated that was part of the ordinance that the county originally pushed forward with the idea of identifying the people with more transparency involved with that. He stated that the question didn't arise with any of the therapists.

Councilmember Nihart stated that as long as they are okay with it, that was what she wanted to be sure, but she would comment on that later.

Councilmember Keener referred to Councilmember Ervin's question, and stated that at least two with the massage therapists were totally okay with the ordinance that he was aware of.

Mayor Digre opened the public hearing.

Lisa Mann, Pacifica, stated that she was CAMTC certified. She thanked the Police Chief. She has worked with 3 or 4 police chiefs regarding this ordinance issue and she felt he was the most accessible and seemed to understand more about the fact that they need to be seen as professionals and very separate from those doing illicit activities. She appreciated his approach. She stated that they didn't get the massage ordinance until Friday from Councilmember Keener. She stated that she passed it on to Beverly May, director of
Governmental Affairs for the California Massage Therapy Council and Tony Sicodus, the American Massage Therapy Association government relations chair. She stated that they both wanted to be present but couldn’t make it on short notice. She had a question from Beverly May and proceeded to read it. It was addressing her concern that the city would charge each business using the exact same facility the full amount for an inspection even though it was only necessary to inspect that facility once. That was what happened to Ms. May in Redwood City, instead of having them share the single cost and she wanted to make sure it didn’t happen in Pacifica. She then referred to wearing the plastic ID, mentioning that it would be inconvenient and explained how it could interfere with a massage. She was okay with having the card and the CAMTC sign in her office, but wearing it was inconvenient.

Mayor Digre closed the public hearing.

Councilmember Nihart thanked her for the comments, adding that she was going to comment on it herself. She personally felt it was a stigma when they can have it on their wall, prominently displayed. She stated that, if you visit someone in their home, you can have it available to show if asked. She mentioned that when she is on an airplane, she has to show it before she can administer care, which she felt was sufficient. She felt it was important to not stigmatize them but treat them for the therapists they are. She stated that she has been a longtime advocate on working on the issues of human trafficking and totally gets it. She doesn’t want trafficking in Pacifica, acknowledging past issues and problems, but she doesn’t want to punish people doing the right thing. She stated that, when the California Massage Therapy Association went to a certification process, she was thrilled at giving them something to hang their hat on and that the community was happy. She felt they should let them handle that and treat them like any other professional who has received the education and maintains their license. She reiterated that it was a great improvement and she only suggests they not have to have it on their person as it was stigmatizing and not necessary, just displayed or on their person if going to a home.

Councilmember Keener endorsed what Councilmember Nihart said.

Councilmember Ervin chimed in with her endorsement.

Councilmember Nihart stated that it was improved and, if they are okay with that one revision, she would move approval.

Mayor Digre mentioned that trafficking was a serious issue and she was happy that her county was aware and concerned. She agreed, adding that she didn’t have any questions or concerns. She agreed with recognizing the skills of those involved in the profession. She does worry about the false ones and she was cheered at how they will catch them. She added that it sounds like they have consensus.

Councilmember Nihart asked if that revision would be easy to do.

Police Chief Steidle stated that he studied with the City Manager and he thought one option for doing it was on page 16 of the ordinance, 15-19.05, subdivision A, where it discusses the wearing of the card. He stated that he was originally thinking of listing it as an alternative to displaying it, but in subdivision D on page 17, it was a requirement that the certificate of each practitioner shall be displayed in a public place on the premises. He thought, if they were satisfied that was sufficient, they could make a motion to adopt and modify.
Councilmember Nihart referred to paragraph above in subdivision C, for mobile individuals, and asked if it says it is on their person or doesn’t have to be on their person.

Councilmember Keener thought it didn’t say it has to be on their person.

Councilmember Nihart stated that would be the only addition she would make, referring to the fact that our California law wasn’t as clear as it might be. She thought it should be on their person, stating if you see someone entering someone’s residence, the police or anyone should be able to ask for that, if they think there is something elicit going on, and they can show they are a licensed therapist.

Police Chief Steidle thought one option would be to strike the entirety of subdivision A, and then he referred to subdivision D referring to being in the office. He stated that, in referring to Councilmember Nihart’s concern, another option would be to strike only the first sentence of subdivision A which would retain the requirement for mobile massage the the CAMTC certificate shall be worn and clearly visible on massage practitioner’s person at all times. Councilmember Nihart stated that she didn’t think it has to be worn.

Police Chief Steidle stated that they can modify it further.

Councilmember Nihart stated that she would say only that it has to be on their person to produce it on site, adding that if a police officer asks them to produce their certificate, they should be able to do that.

Mayor Digre added that also if the customer asks.

Councilmember Nihart agreed that it was a good point that the customer could ask.

Councilmember Keener stated that it should be both for mobile and office situations.

Councilmember Nihart thought it should be the same as any other licenses are.

Councilmember Keener thought they would have to craft a sentence.

Police Chief Steidle thought a good option would be to do it in subdivision D.

Councilmember Nihart asked if he was suggesting they take subdivision A out.

Police Chief Steidle stated that he was, adding that the new second sentence of subdivision D could say something to the effect that, for mobile massage, the practitioner shall have on her person the CAMTC certification.

Councilmember Nihart agreed, adding that the practitioner should be able to show it on request.

Police Chief Steidle wrote down the exact terminology they agreed upon.

Councilmember Nihart stated that they leave open whether it will be produced for a police officer or the client.
Police Chief Steidle stated the exact terminology would be “For mobile massage, the massage practitioner shall have the CAMTC certification on his or her person when providing services and be able to produce it when asked."

Councilmember Nihart thought that was excellent.

Police Chief Steidle stated that it will be the new second sentence of subdivision D and the entirety of subdivision A will be stricken, adding that they will renumber them and subdivision D will become subdivision C.

Councilmember Nihart stated that she was happy.

Mayor Digre asked if they have a problem. She stated that she was entertaining this because she doesn’t want to come back again.

Mayor Digre stated that she didn’t know if it would help to add to keep CAMTC ID card in your possession when working. She stated that she didn’t know if that was helpful. Councilmember Nihart agreed.

Mayor Digre stated they would pass it along to the authorities.

Police Chief Steidle stated that it was consistent with what they are saying.

Mayor pro Tem O’Neill stated that he noticed on page 17 it mentions the time the businesses may be open and that they will be closed between 9 pm and 7 am. He asked if that meant that no mobile massages between 9 pm and 7 am, asking if that should be clarified in the ordinance if that was the intent.

Police Chief Steidle thought the intent was for both.

Mayor pro Tem O’Neill stated that the wording was that no massage shall be open, and he interpreted that to mean just the building, but you could go to someone’s home. He didn’t know if that was the intent.

Police Chief Steidle stated that he thought it was a reasonable interpretation that it is for both, as you are operating a business, whether at a physical location or mobile. He understood the point, but he felt as drafted it does cover it.

Mayor pro Tem O’Neill stated that he just wanted to clarify that.

Councilmember Keener asked about the question from Beverly May about having one room being used by multiple massage therapists and each being charged. He asked if that was covered.

Police Chief Steidle thought it was a good question, but he thought they have that covered. He stated that the purpose of the inspection was not to inspect each individual massage therapist. He explained that the purpose of an inspection would be to inspect the facility to make sure they have everything necessary and it was sanitary as required.

Mayor Digre referred to mention that the police inspection would only be during the hours of operation. She asked if that was the intent.
Police Chief Steidle responded affirmatively.

Mayor Digre asked what they do with the client.

Police Chief Steidle stated that, if there was a client, they wouldn't kick a client out.

Councilmember Nihart asked if they need to take this in three parts because they are different things.

Police Chief Steidle thought it would be the most efficient in case someone has a different opinion.

Councilmember Nihart moved that the ordinance entitled "An Ordinance of the City Council of the City of Pacifica Repealing Existing Chapter 19 and Enacting New Chapter 19 (Massage Businesses) as amended in this session, to Title 5, Public Welfare, Morals and Conduct, of the Pacifica Municipal Code, Relating to the Regulation of Massage Businesses" to be read by title only and that further reading be waived; seconded by Councilmember Keener.

5-0

Councilmember Nihart moved that the ordinance for Amendment to Chapter 4 of Title 9, Article 10 of the Pacifica Municipal Code, Relating to Permitted and Conditional Uses in the C-1, Neighborhood Commercial District of the Pacifica Municipal Code be read by title only and that further reading be waived; seconded by Councilmember Keener.

Councilmember Nihart stated that this was the only one that gave her some pause as she liked how they were doing it before, but she assumed they accepted it.

5-0

Councilmember Nihart moved to adopt a resolution amending the City of Pacifica Master Fee Schedule to reflect changes to fees related to massage therapy permits; seconded by Councilmember Keener.

5-0

Mayor Digre stated that they would take a short break.

Councilmember Nihart stated that she has to recuse herself on the next item on Palmetto which is within her 500-foot radius.

Mayor Digre reconvened the meeting.
RESULT: ADOPTED AS AMENDED [UNANIMOUS]

MOVER: Mary Ann Nihart, Councilmember
SECONDER: John Keener, Councilmember
AYES: Digre, O'Neill, Ervin, Nihart, Keener

CONSIDERATION

7. Palmetto Streetscape Design Recommendations

PROPOSED ACTION: Move to approve the proposed revisions to the original (2013) Palmetto streetscape plan as recommended by staff and the Economic Development Committee (EDC), authorize the City Manager to enter into engineering services agreements to revise the plans for an amount not to exceed $150,000, and to proceed with the advertisement of the project for bid.

Econ. Dev. Mgr, Stedler stated she was presenting the report with Public Works Dir. Ocampo and then presented the staff report.

Mayor pro Tem O'Neill stated that, when they met, he didn’t recall mention of the parklets. He asked how many they think they would have per block or was it still to be determined.

Econ. Dev. Mgr. Stedler stated that it was to be determined, even 15 years from now, because retail fluctuates. She thought, if there is a merchant open to a café and is thriving that merchant can be expected to be a good candidate to apply for a parklet and bear the cost of putting the parklet in. She stated that, if the business changes or moves to larger quarters, something more modest will initially fill the space and a parklet may be inappropriate. She expected that they would see shifts over time and she wouldn’t constraint the number per block but balance the amount of parking and how strongly merchants feel about parking in comparison with the parklets.

Mayor pro Tem O'Neill asked where they would put the arch.

Public Works Dir. Ocampo stated that the arch would be situated at a location on the north end, at the first block of Palmetto. He stated that, instead of putting the second one at the end by Clarendon, they intend to move it across Clarendon instead of putting it on Palmetto by Clarendon. He stated that no one can see it if you put it across Clarendon and you might as well put it by Palmetto, allowing it to be seen if you are coming from 7-Eleven.

Mayor pro Tem O'Neill asked what festival lights were.

Public Works Dir. Ocampo stated that the street lights will be provided with outlets near the top where they can hang festive lights, such as during Christmas, and plug them in to make it more festive.

Mayor pro Tem O'Neill concluded that it was just an outlet.

Public Works Dir. Ocampo reiterated that it was an outlet provided to allow them to hang lights during any specific season or festive event.

Councilmember Ervin thanked them for the insightful and comprehensive discussion. She stated that, when she initially heard about it, she was a little disappointed that they couldn’t do everything they originally intended but, after hearing the reasoning behind the changes, she felt
it was evident why they changed things. She asked if the merchants tend to understand and agree with the changes, such as the sidewalk, etc.

Econ. Dev. Mgr. Stedler stated that they did the outreach through the EDC. They have not reached all the businesses but more than half. She stated that, in most cases they have reached them several times to explain the project with feedback given. She stated that the most remarkable reaction was how people wanted to see it happen and they welcomed planning to let them deliver product results at a cost that would allow them to finish the project. She stated that there was less concern about width once it was explained and that the new band wasn’t a walking surface. She stated that they explained the balance and asked them what their expectations were. She stated that, overall, the goals were a walkable street, a street they care about, an organized area that was a pleasant place to be and inviting. She stated that they would be asked about possibilities, such as a mural on a blank concrete wall, etc.

Councilmember Ervin stated that she was struck by how fast prices are increasing and we will not be able to continue to delay it and still accomplish the project. She then asked the timeline for completing phase one.

Public Works Dir. Ocampo stated that, with the revised plan, the construction period was originally 18 months and reduced to 14, and they were expecting completion of the project by the summer of 2018. He added that the construction period will have interruptions because of winter weather, etc.

Councilmember Ervin referred to the landscaping, adding that she felt it was important to have a lot of greenery for multiple reasons, but she acknowledged that they have to be realistic. She stated that she learned about that when talking with the Beautification Committee about planting that won’t survive because of the ocean air, etc. requiring replanting. She now appreciates using native landscaping instead of palm trees, etc. She appreciated all their analysis as well as the citizens being open to changes being made.

Councilmember Keener referred to the street lights, and he was unclear about where they will be located.

Econ. Dir. Mgr. Stedler stated that the street lights would be off the curb in the edge of the lane where cars would do parallel parking, placing them where the nose of one car meets the end of the other car and be surrounded by a curb that would protect the light.

Councilmember Keener asked how much space they would take up extending into the parking area.

Public Works Dir. Ocampo stated that they would be 4-6 feet extending because of the width of the gutter which was 1.5 feet. He stated that it will not be encroaching in the bike lane, but basically in line of the width of the cars and the gutter will still flow behind it. He stated that the gutter was about 18 inches from the face of the curb to the back, about 6 feet but 18 inches was already allotted for the width of the gutter.

Councilmember Keener concluded that it was basically the width of the parking area.

Public Works Dir. Ocampo responded affirmatively, adding that the bike lane will not get interrupted. He stated that it was the same thing with the bulb outs which would be trimmed
back from the originally proposed plan of 2013, allowing the bike lane to go through the intersection.

Councilmember Keener concluded that there would be 4-5 street lights per block.

Public Works Dir. Ocampo responded affirmatively.

Councilmember Keener asked if that was the amount for one side or if it would be 4-5 on both sides.

Public Works Dir. Ocampo stated that it would be on both sides, depending on the opportunity presented and keeping in mind the parking spaces provided.

Mayor pro Tem O’Neill mentioned that, in their meetings, they have gone over the funding cycle and construction cycle, and to clarify it for the public, he concluded that they have allocated $1+ million from ERAF funds.

Public Works Dir. Ocampo stated that they have allotted $1.5 million which was the certification of participation but from excess ERAF was $375,000.

Mayor pro Tem O’Neill concluded that the COPs that were issued in the past and the $375,000 from ERAF and they have been approved for a $1 million grant from CCAG.

Public Works Dir. Ocampo responded affirmatively, stated that it was the one Bay Area grant program of CCAG for $1 million.

Mayor pro Tem O’Neill concluded that the $1 million was to be received in October of this year. Public Works Dir. Ocampo stated that they will be submitting the request for authorization to proceed this coming week, as they have to do it as soon as possible.

Mayor pro Tem O’Neill understood that they have been working on the blueprints, drawings, etc., to do the bid process in October, once they get the grant and we can hit the ground running.

Public Works Dir. Ocampo responded affirmatively.

Mayor pro Tem O’Neill concluded that they get the $1 million, and the city has the money, and they will issue a bid. He asked if the RFP would be about 90 days.

Public Works Dir. Ocampo mentioned that the grant was on a reimbursement basis. They will provide the authorization to proceed with the advertisement of the project but as soon as they get invoices, they pay it first and then the proof of invoice and cancelled check gets sent to CalTrans for reimbursement, and they were not getting the $1 million check at the beginning but on a reimbursement basis.

Mayor pro Tem O’Neill understood that it was pay as you go.

Public Works Dir. Ocampo responded affirmatively.

Mayor pro Tem O’Neill assumed they accept a bid and then they set a work date. He asked what his estimate would be for the ribbon cutting.
Public Works Dir. Ocampo stated that their current schedule takes them to the first quarter of 2017.

Mayor pro Tem O'Neill concluded that it will be sometime between January and the end of March.

Public Works Dir. Ocampo stated that it will be weather permitting. He stated that you have to advertise for about 30 days, then go to Council for the award of the contract.

Mayor pro Tem O'Neill asked him how long he sees the construction period being.

Public Works Dir. Ocampo stated that they anticipate construction will be around 14 months, but during the period of the last weekend in September, during the FogFest, they will stop construction the week before to make sure that the street is usable with no hazards during Fog Fest, and they will continue after that.

Mayor pro Tem O'Neill asked if, during construction, will it be phased in, finish one block and move on the next block or doing a little bit in each block.

Public Works Dir. Ocampo stated that it depends on the item of work. He stated that this project was supposed to provide the electricity for the street light, and that means you have to trench from where the street lights are to the source provided by PG&E. He stated that one trench that will be the entire street will be the installation of the reclaimed water line for the purpose of irrigating the planters at the bulb outs, stating that the trenching will be from Clarendon by the golf course all the way to Paloma.

Mayor pro Tem O'Neill thought we are probably looking at construction starting in the first quarter of 2017, lasting 14 months.

Public Works Dir. Ocampo stated that 14 months was the best estimate.

Mayor pro Tem O'Neill thought they were looking at the summer of 2018 when it could be up and running.

Public Works Dir. Ocampo responded affirmatively.

Mayor pro Tem O'Neill stated that he was asking so that everyone has a framework and idea of what to expect.

Councilmember Keener stated that his question raised the question regarding water issue, with landscaping and bulbouts, and purple pipes. He asked if that will be reclaimed water.

Public Works Dir. Ocampo responded affirmatively, also adding that the street lights will be LED.

Councilmember Ervin asked if the bike lanes will be placed in the center of the street so they will not be in the same area as parking.

Public Works Dir. Ocampo stated that the bike lane will be in a four-foot space between the parking lane and the travel lane.
Councilmember Ervin stated that it was not safe where they were along the sidewalk, and next to car doors and she was happy to see the bike lanes being placed strategically.

Public Works Dir. Ocampo explained that, from the face of curb, you will have parallel parking and then 4 feet of space designated for bike lane and the travel lane of 12 feet. He stated that the bike lanes will be painted green.

Councilmember Ervin asked if they are extended, it would be nice to have that same look.

Public Works Dir. Ocampo stated that it can be done that way.

Mayor Digre opened public comments.

**Eric Ruchames, Pacifica**, stated that, as a 40-year resident of Sharp Park, this was long overdue and he felt it was great to see them moving forward. He felt it will be a great main street and he appreciated the effort in doing it. He thought it was important that the revitalization of the area by connecting it to the library and Beach Blvd. project will be a huge boost to the community, for services and economic revitalization. He mentioned that staff deserved kudos for improving the city's financial standing by taking care of things they said they would do. He felt this was an example of improving the city's credibility by actually finishing projects and making improvements. He thanked everyone in West Sharp Park and staff who have done the hard work.

**Robine Runneals, Pacifica**, stated that she is on FogFest board and was asked to pass on information regarding meetings, and the discussion of this presentation and changes with the streetscape. She was on board with the streetscape and has been on board for over 20 years. She stated that FogFest looked at it. She acknowledged that they have been successful keeping the street open for FogFest. She stated that, with the bulb outs, bike racks, parklets, the board has estimated that approximately 70 vendor booths will be displaced from the work on the street. She stated that FogFest would not be viable with the loss of 70 vendor booths and still contribute to the community and pay bills and have something left to give to the non-profits. She stated that they need to have a different discussion in terms of where the booths might go, possibly expanding FogFest further into the neighborhood to accommodate that and keep FogFest viable. She then stated that as a neighbor and former member of West Pac, she was sad at the loss of trees, but the future success comes from the aesthetics. She feels that the sidewalks are ugly, the street looks bad. She stated that, if the street will be repaved, she suggests that they work on the existing sidewalk to make it more aesthetic. She felt aesthetics was what will bring people to the neighborhood and bring in new businesses. She felt a new sidewalk would have a new look, and existing sidewalks are in bad shape. She passed out pictures to give them inspiration for phase 2. She accepted that sidewalks can be smaller but felt they have to look good.

**Sue Beckmeyer, Pacifica**, stated that she was with Pacificans for the New Library and she supports it. She was also pleased to support adopting the proposed changes and moving forward with the streetscape as described. She stated that, as a citizen, she has lived in Pacifica for 23 years, but would like to state that, while she sees the businesses as major stakeholders, she proposed that all Pacificans were stakeholders and could be proud of Palmetto Avenue as our main street and mentioned the benefits of having the library, to walk along the street, shop and eat was a big plus. She stated that, after the completion of the first phase of the streetscape, she looks forward to it all coming together for a revitalized Palmetto.
Chuck Evans, Pacifica, stated that he is speaking as a citizen and liked the idea of the scaled down version because Burlingame did a major streetscape model and it killed several small businesses during that time. He didn’t want to see that happen in Pacifica. He liked the scaled down version, stating the concrete work in front of the businesses would not be received very well. He felt it looks wonderful. He referred to the parklets, stating that Millbrae was doing that now. He thought it was a neat idea, adding that the idea of being movable was also neat as businesses come and go.

Mayor Digre closed public comments.

Councilmember Ervin asked if staff could comment on Robine Runneals’ comment regarding the Fog Fest losing 73 spots and what we might be able to do to accommodate that issue.

Public Works Dir. Ocampo stated that, with the revised version of the plans and the bulbouts, the parklets are getting eliminated and that was an additional spot for FogFest booths.

Councilmember Ervin asked how many.

Public Works Dir. Ocampo stated that it was about five, but depending on the layout, they can translate it into two spaces. He stated that, regarding the bulbouts, with the revised version, they are actually getting trimmed as well as decreased in size and that lends itself to that. He stated that they met with Mr. Passmore with the idea to extend FogFest further north to make up for loss at the corners.

Councilmember Ervin agreed with the speakers about enhancing life for people in Pacifica and our economic sustainability. She felt this was moving the city forward, with a smart plan and smart growth in a charismatic way, as we retain the culture of Pacifica. She was excited about a project that can offer so much to our community with the library added. She felt this will enhance what we can offer to citizens and tourists. She was excited and hopeful about the project.

Councilmember Keener stated that the new plans were a marked improvement. He stated that they didn’t mention some things they mentioned to him, such as changes in the storm sewers, and he felt there will be a tremendous amount of work avoided by the new plan. He felt it was carefully thought through and he commended them. He mentioned that he voted against the streetscape project several times, and he will again, even though he thinks this is better. He explained that it was because our budget was constrained and he felt they should dedicate funds to more pressing needs, such as the condition of streets and the sea issue. He wished them luck for the improvements but he will vote against it.

Mayor pro Tem O’Neill agreed with a lot of what Councilmember Keener said in that they have other pressing needs, but he felt the definition of insanity was to keep doing the same thing over and over. He stated that the town has never confidently invested in itself to move forward, and he felt voting no was showing a lack of confidence and trust in the city and the citizens in the neighborhood. He felt, in order to get the revenue to fix the streets, they need to make an investment to increase our tax base, and he felt this was a vehicle to help the city do that.

Mayor Digre stated that Palmetto has always been her favorite goal and she felt the revision was very helpful and they can actually move forward and still keep our aesthetics which are extremely important. She was happy to see people offering different ways of helping. She
stated that the City Manager learned about the parking app and she thought it will happen. She stated that parking apps will create less worry about parking spaces, mentioning that they are being used in other areas, such as San Francisco. She liked different things for the sidewalk, such as murals. She understood the low plants that will survive, and that the merchants will take care of them. She liked that they spent time talking to the merchants and residents, and liked that kind of engagement and thought it was an integral part of moving forward. She felt that was an important and helpful step. She referred to the loss of 70 vendor sites, and mentioned that they could have some of the booths go around to the Little Brown Church. She appreciated all the hard work. She was optimistic and liked that it is going fast which she thought will help our economy and image in many ways. She stated that her worry was whether they were planning for the kinds of businesses to supplement what we have, adding that she thought they said it was being addressed.

Councilmember Ervin moved to approve the proposed revisions to the original (2013) Palmetto streetscape plan as recommended by staff and the Economic Development Committee (EDC), authorize the City Manger to enter into engineering services agreements to revise the plans for an amount not to exceed $150,000 and to proceed with the advertisement of the project for bid; seconded by Mayor pro Tem O’Neill.

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<td>Keener</td>
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ADJOURN

Mayor Digre adjourned the meeting at 9:50 p.m.

Transcribed by Barbara Medina, Public Meeting Stenographer.

Respectfully submitted,

Kathy O’Connell, City Clerk

APPROVED:

Sue Digre, Mayor
SUBJECT:

Proclamation Confirming Existence of Local Emergency of the Pacifica Coastline from Westline Drive to the End of Beach Boulevard.

RECOMMENDED ACTION:

Accept current photos as of August 17, 2016 (Attachment 2) and move to continue proclamation confirming the existence of a local emergency of the Pacifica Coastline from Westline Drive to the End of Beach Boulevard.

STAFF CONTACT:

Kathy O’Connell, City Clerk
o’connellk@ci.pacifica.ca.us
650-738-7307

BACKGROUND/DISCUSSION:

On January 22, 2016 the Director of Emergency Services proclaimed the existence of a local emergency along the Pacifica coastline from Westline Drive to the end of Beach Boulevard due to El Nino storm activity.

Extreme wave heights for extended periods of time caused top-of-bluff retreat at several locations along the Pacifica coast and damage to City infrastructure as described below:

- failure of the sea wall and promenade on Beach Blvd. near Santa Maria Ave.;
- damage to a section of the concrete railing along the City pier;
- the undermining of a seven foot diameter storm drain outfall and concrete headwall for the discharge of Milagra Creek drainage to the ocean.

The City Council ratified this proclamation at their January 25, 2016, regular meeting (Attachment 1).

Since that date, additional damage has occurred including an additional ground subsidence (sinkhole) of the Beach Blvd. promenade near Paloma Ave., and additional sea wall breach between the pre-existing two locations.

Council is asked to continue the proclamation until the emergency is concluded as part of the State grant requirements. Current photos are included as Attachment 2.

FISCAL IMPACT:

None.

ORIGINATED BY:
ATTACHMENT LIST:

Proclamation of Local Emergency (Attachment 1)  (PDF)
Council Emergency photos as of 8-17-16   (PDF)
PROCLAMATION OF LOCAL EMERGENCY

WHEREAS, Section 4-2.01 et seq. of the Pacifica Municipal Code empowers the Director of Emergency Services to proclaim the existence or threatened existence of a local emergency when the City Council is not in session, subject to confirmation by the City Council at the earliest possible time; and

WHEREAS, the City Manager is the Director of Emergency Services of the City of Pacifica; and

WHEREAS, the winter of 2015/2016 has seen the strongest El Nino ocean temperature rise since 1998; and

WHEREAS, the resulting thermal water expansion has caused elevated ocean levels and tides off the coast of Pacifica; and

WHEREAS, recent ocean conditions include combined 25 foot King Tides with very high swell exceeding 15 feet offshore; and

WHEREAS, recent El Nino storm activity has also saturated the earth, including bluffs and surrounding earth at the ocean’s edge; and

WHEREAS, a long series of El Nino-induced storm fronts have brought warm pineapple-convection storms from the southwest, as well as additional cold winter fronts from the northwest; and

WHEREAS, extensive top of bluff retreat is occurring at several locations along the Pacifica Coast; and

WHEREAS, predicted significant storms through February 2016 are anticipated to bring significant additional coastal erosion within Pacifica, including but not limited to the coastline from Westline Drive to the end of Beach Blvd.; and

WHEREAS, these conditions present extreme peril and threaten the safety of persons and property, including critical public infrastructure; and

WHEREAS, recent storm activities and extreme wave heights for extended periods have caused ground subsidence (sinkhole) contributing to the failure of the sea wall at Beach Boulevard and Santa Maria Avenue, including undermining of adjacent promenade and road closure; and

WHEREAS, these storm activities and extreme wave heights have also caused a section of concrete railing along the City pier to fail, resulting in partial closure of the pier; and

WHEREAS, these storm activities and extreme wave heights have also caused undermining and displacement of a 7 foot diameter storm drain outfall and the massive concrete headwall for the discharge of Milagra Creek drainage to the ocean; and
WHEREAS, such conditions are or are likely to be beyond the financial and handling capability of the City's services, personnel, equipment, and facilities, requiring the combined forces of the other political subdivisions to combat; and

WHEREAS, the City provides this written notification to the San Mateo County and State CalEMA's Regional and Headquarters of a proclamation of local emergency; and

WHEREAS, such proclamation shall be subject to confirmation by the Pacifica City Council at the earliest possible time.

NOW, THEREFORE, BE IT PROCLAIMED that, in accordance with State Law and the City of Pacifica Municipal Code, the Director of Emergency Services proclaims the existence of a local emergency along the Pacifica coastline from Westline Drive to the end of Beach Blvd.

DATED: January 22, 2016

By: 

Lorie Tinslow
Director of Emergency Services
400 ESPLANADE

A. BLUFF FAILURE DEPOSITED SAND AND BOULDERS ON THE BEACH.

B. CONTINUE BLUFF FAILURE.
SUBJECT:
Adoption of an Ordinance to Amend Chapter 4, Title 9, Permitted and Conditional Uses in the C-1, Neighborhood Commercial District of the Pacifica Municipal Code (Second Reading)

RECOMMENDED ACTION:
Move to adopt "An Ordinance to Amend Chapter 4, Title 9, Permitted and Conditional Uses in the C-1, Neighborhood Commercial District of the Pacifica Municipal Code.

ALTERNATIVE ACTION:
None.

STAFF CONTACT:
Kathy O'Connell, City Clerk
o'connellk@ci.pacifica.ca.us
650-738-7307

BACKGROUND/DISCUSSION:
This ordinance was introduced at the August 8, 2016 regular City Council meeting and is now in order for adoption.

FISCAL IMPACT:
None associated with the second reading.

ORIGINATED BY:
City Clerk

ATTACHMENT LIST:
None.  (TXT)
ORDINANCE NO. (ID # 2011)

ORDINANCE NO.

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF PACIFICA INITIATING A ZONING TEXT AMENDMENT TA-104-16 AMENDING TITLE 9, CHAPTER 4, ARTICLE 10 OF THE PACIFICA MUNICIPAL CODE RELATING TO PERMITTED AND CONDITIONAL USES IN THE C-1, NEIGHBORHOOD COMMERCIAL DISTRICT

The City Council of the City of Pacifica, State of California, ORDAINS as follows:

WHEREAS, on February 8, 2016, the City Council of the City of Pacifica considered introduction of an ordinance enacting new licensing standards for massage businesses and directed staff to make revisions to the ordinance in order to prevent unlawful activities while not precluding or creating an onerous process for licensed therapists who provide a valuable service; and

WHEREAS, in the course of implementing City Council direction, staff noted that a Use Permit is required for massage establishments in certain commercial districts which appears to be an antiquated requirement and redundant for smaller scale operators with enactment of licensing requirements administered by the Pacifica Police Department; and

WHEREAS, the proposed ordinance, attached as Exhibit A, would remove the Use Permit requirement for massage establishments under 640 square feet of treatment floorspace, instead referencing Massage Licensing requirements contained in the Municipal Code; and

WHEREAS, the proposed amendment is consistent with the City’s General Plan and Local Coastal Land Use Plan; and
WHEREAS, the proposed amendment is exempt from the California Environmental Quality Act (CEQA) under Section 15061(b)(3) of the CEQA Guidelines;

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Pacifica does hereby initiate an amendment to Title 9, Chapter 4, Article 10 of the Pacifica Municipal Code;

BE IT FURTHER RESOLVED that the City Council of the City of Pacifica does hereby recommend approval of the zoning text amendment described in Text Amendment TA-104-16 (Exhibit “A”).

Section 1. Recitals. The City Council of the City of Pacifica does hereby find that the above referenced recitals are true and correct and material to the adoption of this Ordinance.

Section 2. Environmental Review. The proposed amendment is exempt from environmental review under CEQA pursuant to Section 15061(b)(3) of the CEQA Guidelines because it can be seen with certainty that there is no possibility that removal of the Use Permit requirement for massage establishments may have a significant effect on the environment.

Section 3. Amendments. Title 9, Chapter 4, Article 10, Section 9-4.1001 of the Pacifica Municipal Code is hereby amended and shall read as follows:

Article 10. - C-1 Neighborhood Commercial District

Sec. 9-4.1001. - Permitted and conditional uses.

(a) Permitted uses. The following uses shall be permitted in the C-1 District:

(1) Retail uses, including but not limited to, food markets, drug stores, liquor stores and retail restaurants, but excluding firearms sales;
(2) Personal services, such as professional offices, shoe repair, barber and beauty shops, laundries and dry cleaning establishments, banks and financial institutions, and massage establishments under 640 square feet of treatment floorspace (see licensing requirements Title 5, Chapter 19);

(3) Business and administrative offices when located entirely above the ground floor of any commercial structure;

(4) Art galleries and instructional studios for dance and arts or crafts and craft production shops; and

(5) In the Coastal Zone, visitor-serving commercial uses, as defined in Section 9-4.4302(av) of Article 43 of this chapter.

(b) **Conditional uses.** Conditional uses allowed in the C-1 District, subject to obtaining a use permit, shall be as follows:

1. Service stations;
2. Retail alcohol sales in conjunction with service stations;
3. Mini-markets and similar retail uses in conjunction with service stations;
4. Conversion of service stations from full-service to self-service;
5. Motels and drive-in restaurants;
6. Veterinary hospitals and clinics (small animals);
7. Special care and child care facilities;
8. Business and administrative offices, if located on the ground floor;
9. Amusement machine arcades as a new or a part of an existing use;
10. Massage establishments with 640 square feet or larger of treatment floorspace;
11. One or more dwelling units in the same building as a commercial use when located entirely above the ground floor. Density shall be controlled by a minimum lot area per dwelling unit of 2,000 square feet;
12. Restaurants and fast food restaurants; and.
13. Pet care and sales establishments, including boarding and grooming.
Section 4. Severability. If any section, subsection, sentence, clause or phrase of this Ordinance is for any reason held to be invalid, such decision shall not affect the validity of the remaining portions of this Ordinance. The City Council hereby declares that it would have adopted the Ordinance and each section, subsection, sentence, clause or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be declared unconstitutional.

Section 5. Publication. The City Clerk is hereby ordered and directed to certify the passage of this Ordinance by the City Council of the City of Pacifica, California, and cause the same to be published once in The Pacifica Tribune, a newspaper of general circulation, published and circulated in the City of Pacifica, California.

Section 6. Effective Date. This Ordinance shall be in full force and effective thirty (30) days after its adoption and shall be published and posted as required by law. For properties located in the Coastal Zone, this ordinance shall not become effective until approved or deemed approved by the California Coastal Commission pursuant to Public Resources Code section 30513.

The City Clerk shall publish this ordinance according to law.

* * * * * * * *

Introduced at a regular City Council meeting held on August 8, 2016. PASSED AND ADOPTED this _____ day of________, 2016, by the following vote:

AYES, Councilmembers:
NOES, Councilmembers:
ABSTAIN, Councilmembers:
ABSENT, Councilmembers:

_____________________________________
Sue Digre, Mayor
ATTEST:

_______________________________
Kathy O'Connell, City Clerk

APPROVED AS TO FORM:

_______________________________
Michelle Kenyon, City Attorney

* * * * *

Adopted (ID # 2011) at 9/12/2016 7:00 PM City Council Regular Meeting

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<td>MOVER:</td>
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<td>Digre, O'Neill, Ervin, Nihart, Keener</td>
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SUBJECT:

Adoption of an Ordinance of the City Council of the City of Pacifica Repealing Existing Chapter 19 and Enacting New Chapter 19 (Massage Businesses) to Title 5, Public Welfare, Morals, and Conduct, of the Pacifica Municipal Code, Relating to the Regulation of Massage Business (Second Reading)

RECOMMENDED ACTIONS:

Move to adopt the ordinance entitled "Ordinance of the City Council of the City of Pacifica Repealing Existing Chapter 19 and Enacting New Chapter 19 (Massage Businesses) to Title 5, Public Welfare, Morals, and Conduct, of the Pacifica Municipal Code, Relating to the Regulation of Massage Business"

STAFF CONTACT:

Kathy O'Connell, City Clerk
o'connellk@ci.pacifica.ca.us
650-738-7307

BACKGROUND/DISCUSSION:

This ordinance was introduced at the regular meeting of the City Council held on August 8, 2016 and is now in order for adoption.

FISCAL IMPACT:

None associated with the second reading.

ORIGINATED BY:

City Clerk

ATTACHMENT LIST:

None. (TXT)
ORDINANCE NO. (ID # 2010)

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF PACIFICA REPEALING EXISTING CHAPTER 19 AND ENACTING NEW CHAPTER 19 (MASSAGE BUSINESSES) TO TITLE 5, PUBLIC WELFARE, MORALS, AND CONDUCT, OF THE PACIFICA MUNICIPAL CODE, RELATING TO THE REGULATION OF MASSAGE BUSINESSES

The City Council of the City of Pacifica, State of California, ORDAINS as follows:

SECTION 1. FINDINGS. In enacting these regulations the City Council recognizes that massage is a viable professional field offering the public valuable health and therapeutic services. The City Council finds and declares as follows:

(a) The registration and health and safety requirements imposed by this chapter are reasonably necessary to protect the health, safety and welfare of the citizens of the City.

(b) Massage businesses have been found to present opportunities for acts of prostitution and other unlawful activity, and, in fact, officers have made arrests for prostitution in massage businesses located within the City. Municipalities within the County have also reported instances where acts of prostitution have occurred in massage businesses.

(c) The California legislature and the courts have long recognized the necessity of imposing reasonable regulations and standards for the operation of massage businesses, including but not limited to minimum educational and experience requirements, passage of a practical examination of competence, sanitary conditions, hours of operation, and other operational regulations designed to minimize opportunities for illegal activities and to ensure the protection of the health, safety and welfare of citizens.

(d) There is a significant risk of injury to clients of massage businesses by improperly trained or poorly educated massage practitioners.
(e) The presence of businesses known or reputed to be places of prostitution or other illegal activity can have an adverse impact on surrounding properties and result in blight, foster further illegal activities, and generally become a public nuisance.

**SECTION 2.** Chapter 19 (Massage, Bathing, and Health Establishments and Persons Offering Services Therein) of Title 5 (Public Welfare, Morals, and Conduct) of the Pacifica Municipal Code, as presently written, is hereby repealed.

**SECTION 3.** New Chapter 19 (Massage Businesses) of Title 5 (Public Welfare, Morals, and Conduct) of the Pacifica Municipal Code is adopted, to read as follows:

Chapter 19 MASSAGE BUSINESSES

5-19.01 PURPOSE AND INTENT.

(a) In enacting this chapter, the City Council recognizes that commercial massage therapy is a professional pursuit which can offer the public valuable health and therapeutic services. The City Council further recognizes that, unless properly regulated, the practice of massage therapy and the operation of massage businesses may be associated with unlawful activity and pose a threat to the quality of life in the local community. Accordingly, it is the purpose and intent of this chapter to protect the public health, safety, and welfare by providing for the orderly regulation of businesses providing massage therapy services, discouraging prostitution and related illegal activities carried on under the guise of massage therapy, and establishing certain sanitation, health, and operational standards for massage businesses.

(b) Furthermore, it is the purpose and intent of this chapter to address the negative impacts identified in the City Council’s findings to reduce or prevent neighborhood blight and to protect and preserve the quality of City neighborhoods and commercial districts; and to enhance enforcement of criminal statutes relating to the conduct of operators and employees of massage businesses.

(c) It is the Council’s further purpose and intent to rely upon the uniform statewide regulations applicable to massage practitioners and establishments that were enacted by the State Legislature in 2008 as Business and Professions Code sections 4600 et seq. by Senate Bill 731, and amended in 2011 by Assembly Bill 619 and in
2014 by Assembly Bill 1147, to restrict the commercial practice of massage in the City to those persons duly certified to practice by the California Massage Therapy Council, and to provide for the registration and regulation of massage businesses for health and safety purposes to the extent allowed by law.

5-19.02 DEFINITIONS.

For the purposes of this chapter, unless the particular provision or the context otherwise clearly requires, the definitions in this section shall govern the construction, meaning, and application of words and phrases used in this chapter:

a) “Business” includes, but not by way of limitation, everything about which a person can be employed, and means that which occupies the time, attention, and labor of individuals for the purpose of producing a livelihood or profit, and connotes the efforts of individuals by varied and diverse methods of dealing with each other, to improve their individual economic conditions, and for the purposes of this chapter shall include, without limitation, the advertising and soliciting of massages. The term “business” includes, but is not limited to, a massage practitioner who is the sole owner, operator and employee of a massage business operating as a sole proprietorship, as well as a massage establishment which employs massage practitioners and therapists.

b) “California Massage Therapy Council” or “CAMTC” means the Massage Therapy Organization formed pursuant to Business and Professions Code section 4600.5.

c) “Certified massage practitioner” means any individual certified by the California Massage Therapy Council as a certified massage therapist or as a certified massage practitioner pursuant to California Business and Professions Code sections 4600 et seq.

d) “Client” means the customer or patron who pays for or receives massage services.

e) “Compensation” means the payment, loan, advance, donation, contribution, deposit, exchange, or gift of money or anything of value.
f) “City registration certificate” means a registration certificate issued by the certification officer upon submission of satisfactory evidence that a massage business employs or uses only certified massage practitioners pursuant to this chapter.

g) “Certification officer” means a representative of the Pacifica Police Department or designees.

h) “Employee” means any person employed by a massage business who may render any service to the business, and who receives any form of compensation from the business.

i) “Health Officer” means a representative from the County of San Mateo Department of Environmental Health or designee and/or a person designated by the City of Pacifica to conduct health and safety inspections.

j) “Hearing Officer” means that person designated by the City Manager who shall be selected in a manner that avoids the potential for pecuniary or other bias and in no event shall be the certification officer, nor any other officer or employee in the certification officer’s department.

k) “Massage” or “massage therapy,” means and refers to any method of treating the external parts of the body for remedial, health, or hygienic purposes for any form of compensation by means of pressure on or friction against, or stroking, kneading, rubbing, tapping, pounding, or stimulating the external parts of the body, with or without the aid of any mechanical or electrical apparatus or appliances; or with or without supplementary aids, such as rubbing alcohol, liniments, antiseptics, oils, powders, creams, lotions, ointments, or other similar preparations commonly used in this practice; or by baths, including but not limited to Turkish, Russian, Swedish, Japanese, vapor, shower, electric tub, sponge, mineral, fomentation, or any other type of bath.

l) “Massage business” means any business that offers massage therapy in exchange for compensation. Any business that offers any combination of massage therapy and bath facilities – including, but not limited to, showers, baths, wet and dry heat rooms, pools and hot tubs – shall be deemed a massage business under this chapter. The term “massage business” includes a certified massage practitioner who is the sole owner, operator and employee of a massage business operating as a sole proprietorship.
m) “Mobile massage” means the engaging in or carrying on of massage therapy for compensation in a location other than the business operations address set forth in the massage business’s City registration certificate.

n) “Operator” or “massage business operator” means any and all owners of a massage business.

o) “Owner” or “massage business owner” means any of the following persons:
   a. Any person who is a general partner of a general or limited partnership that owns a massage business.
   b. Any person who has a five percent (5%) or greater ownership interest in a corporation that owns a massage business.
   c. Any person who is a member of a limited liability company that owns a massage business.
   d. Any person who has a five percent (5%) or greater ownership interest in any other type of business association that owns a massage business.

p) “Person” means any individual, firm, association, partnership, corporation, joint venture, limited liability company, or combination of individuals.

q) “Practitioner” or “massage practitioner” shall be used interchangeably and mean any person who administers massage to another person, for any form of consideration (whether for the massage, as part of other services or a product, or otherwise).

r) “Reception and waiting area” means an area immediately inside the front door of the massage business dedicated to the reception and waiting of patrons of the massage business and visitors, and which is not a massage therapy room or otherwise used for the provision of massage therapy services.

s) “Registration” means the registration required by this chapter to operate a massage business.

t) “School of massage” means any school or institution of learning that is recognized as an approved school pursuant to Business and Professions Code Division 2, Chapter 10.5, as currently drafted or as may be amended.
u) “Sole proprietorship” means and includes any legal form of business organization where the business owner (sometimes referred to as the “sole proprietor”) is the only person employed by that business to provide massage services.

v) “Solicit” means to request, ask, demand or otherwise arrange for the provision of services.

5-19.03 CAMTC CERTIFICATION AND LOCAL REGISTRATION REQUIRED

(a) Individuals. On and after the effective date of this Ordinance, it shall be unlawful for any individual to practice massage therapy for compensation as a sole proprietorship or employee of a massage business or in any other capacity within the City unless that individual is a certified massage practitioner.

(b) Businesses. On and after the effective date of this Ordinance, it shall be unlawful for any business to provide massage for compensation within the City unless all individuals employed by the massage business to perform massage, whether as an employee, independent contractor, or sole proprietorship, are certified massage practitioners and said business has obtained a valid City registration certificate as provided in this chapter.

(c) Exemption. The Council recognizes that some massage practitioners currently practicing in Pacifica may not meet the standards set forth by the CAMTC due to changes in educational or other requirements, particularly changes in requirements concerning hours of schooling. Therefore, non-CAMTC certified individuals lawfully practicing massage therapy in Pacifica at the time this chapter goes into effect will be allowed to continue practicing without certification from the CAMTC. Non-CAMTC practitioners shall complete the same City registration and renewal process as CAMTC certified practitioners, but shall not be required to provide a CAMTC certification.

5-19.04 MASSAGE BUSINESS REGISTRATION

(a) Application. The registration application for a City registration certificate shall include all of the following:
(1) Legal name of the massage business.
(2) Address and telephone number of the massage business.
(3) Legal names of all owners of the massage business.
(4) A list of all of the massage business’s employees and independent contractors who are performing massage and their CAMTC certification.
(5) Residence address and telephone number of all owners of the massage business.
(6) Business address and telephone number of all owners of the massage business.
(7) The form of business under which the massage business will be operating (i.e., corporation, general or limited partnership, limited liability company, or other form).
(8) Each owner or operator of the massage business who is not a CAMTC-certified massage practitioner shall submit an application for a background check, including the following: the individual’s business, occupation, and employment history for the five (5) years preceding the date of the application; the inclusive dates of such employment history; the name and address of any massage business or similar business owned or operated by the individual whether inside or outside the County of San Mateo and its incorporated cities.
(9) For all owners, a valid and current driver's license and/or identification issued by a state or federal governmental agency or other photographic identification bearing a bona fide seal by a foreign government.
(10) For all owners, a signed statement that all of the information contained in the application is true and correct under penalty of perjury; that all owners shall be responsible for the conduct of the business's employees or independent contractors providing massage services; and acknowledging that failure to comply with the California Business and Professions Code sections 4600 et seq., any local, state, or federal law, or the provisions of this chapter may result in revocation of the business's City registration certificate.
(b) Issuance. Upon provision by the massage business of the foregoing documentation, the certification officer shall issue the massage business a City registration certificate, which shall be valid for two (2) years from the date of issuance. No reapplication will be accepted within one (1) year after an application or renewal is denied or a certificate is revoked. The certification officer may decline to issue a City registration certificate if any of the required information is not true, complete, or correct, or if an individual required to submit to a background check pursuant to subsection (8) above fails to pass such background check. City registration certificates may not be issued to a massage business seeking to operate at a particular location if:

(1) another massage business is or was operating at that particular location and that massage business is currently serving a suspension or revocation pursuant to Section 5-19.11, during the pendency of the suspension or one year following revocation;

(2) another massage business is or was operating at that particular location and that massage business has received a Notice of Suspension, Revocation or fine issued pursuant to Sections 5-19.10 and 5-19.11, during the ten day period following receipt of the Notice or while any appeal of a suspension, revocation or fine is pending.

(3) another massage business is or was operating at that particular location and that massage business has outstanding fines issued pursuant to Section 5-19.10 that have not been paid.

(c) Amendment. A massage business shall apply to the City to amend its City registration certificate within thirty (30) days after any change in the registration information, including, but not limited to, the hiring or termination of certified massage practitioners, the change of the business’s address, or changes in the owner’s addresses and/or telephone numbers.

(d) Renewal. A massage business shall apply to the City to renew its City registration certificate at least thirty (30) days prior to the expiration of said City registration certificate. If an application for renewal of a City registration certificate and all required information is not timely received and the certificate expires, no right or privilege to provide massage shall exist.
(e) Fees. The registration application, and any amendment to or renewal of an existing registration certificate, shall be accompanied by a fee as specified by resolution of the City Council, no part of which shall be refundable. The provisions of this section shall not prevent the City from establishing additional fees for safety inspections as may be conducted from time to time, and for the background checks, fingerprinting, and subsequent arrest notification for owners of a massage business who are not CAMTC-certified and who are subject to such background checks pursuant to this chapter. There are certain fees for appeals as described below.

(f) Transfer. A City registration certificate shall not be transferred except with the prior written approval of the certification officer. A written request for such transfer shall contain the same information for the new ownership as is required for applications for registration pursuant to this section. In the event of denial, notification of the denial and reasons therefore shall be provided in writing and shall be provided to the applicant by personal delivery or by registered or certified mail. A City registration certificate may not be transferred during any period of suspension or one year following revocation pursuant to Section 5-19.11, during the ten day period following a massage businesses’ receipt of a Notice of Suspension, Revocation or fine issued pursuant to Sections 5-19.10 and 5-19.11 or while any appeal of a suspension, revocation or fine is pending. Further, a City registration certificate may not be transferred until all outstanding fines issued pursuant to Section 5-19.10 have been paid.

(g) Use permit: An application for a use permit shall be filed in the office of the Planning Department pursuant to the provisions of Article 33 of Chapter 4 of Title 9 of this Code if the massage establishment has 640 square feet or greater of treatment space. If a use permit is required, a City registration certificate will not be issued until approval of the use permit.

5-19.05 OPERATING REQUIREMENTS.

On or after the effective date of this Ordinance, no person shall engage in, conduct, carry on, or permit any massage within the City unless all of the following requirements are met:
(a) Massage shall be provided or given only between the hours of 7:00 a.m. and 9:00 p.m. No massage business shall be open and no massage shall be provided between 9:00 p.m. and 7:00 a.m. A massage commenced prior to 9:00 p.m. shall nevertheless terminate at 9:00 p.m., and, in the case of a massage business, all clients shall exit the premises at that time. It is the obligation of the massage business, to inform clients of the requirement that services must cease at 9:00 p.m.

(b) A list of the services available and the cost of such services shall be posted in the reception area within the massage premises, and shall be described in readily understandable language. For mobile massage, the massage practitioner shall make a list of the services and the cost of such services available for review by the client upon request. No owner, manager, operator, or responsible managing employee shall permit, and no massage practitioner shall offer or perform, any service other than those posted or listed as required herein, nor shall an operator or a massage practitioner request or charge a fee for any service other than those on the list of services available and posted in the reception area of the business.

(c) A copy of the CAMTC certificate of each and every massage practitioner employed in the business shall be displayed in the reception area or similar open public place on the premises. For mobile massage, the massage practitioner shall have the CAMTC certification on his or her person when providing series and be able to produce it when asked. CAMTC certificates of former employees and/or contractors shall be removed as soon as those massage practitioners are no longer employed by or offering services through the massage business.

(d) For each massage service provided, every massage business shall keep a complete and legible written record of the following information: the date and hour that service was provided; the service received; the name or initials of the employee entering the information; and the name of the massage practitioner administering the service. Such records shall be open to inspection and copying by police officers, or other City officials charged with enforcement of this chapter. These records may not be used by any massage practitioner or operator for any purpose other than as records of service provided and may not be provided to other parties by the massage practitioner or operator unless otherwise required by law. Such records shall be retained on the
premises of the massage business for a period of two (2) years and be immediately available for inspection during business hours.

(e) Massage businesses shall at all times be equipped with an adequate supply of clean sanitary towels, coverings, and linens. Clean towels, coverings, and linens shall be stored in enclosed cabinets. Towels and linens shall not be used on more than one (1) client, unless they have first been laundered and disinfected. Disposable towels and coverings shall not be used on more than one (1) client. Soiled linens and paper towels shall be deposited in separate, approved receptacles.

(f) Wet and dry heat rooms, steam or vapor rooms or cabinets, toilet rooms, shower and bath rooms, tanning booths, whirlpool baths and pools shall be thoroughly cleaned and disinfected as needed, and at least once each day the premises are open, with a disinfectant approved by the health officer. Bathtubs shall be thoroughly cleaned after each use with a disinfectant approved by the health officer. All walls, ceilings, floors, and other physical facilities for the business must be in good repair, and maintained in a clean and sanitary condition.

(g) Instruments utilized in performing massage shall not be used on more than one (1) client unless they have been sterilized, using approved sterilization methods.

(h) All massage business operators and their employees, including massage practitioners, shall wear clean, non-transparent outer garments. Said garments shall not expose their genitals, pubic areas, buttocks, or chest, and shall not be worn in such manner as to expose the genitals, pubic areas, buttocks, or chest. For the purposes of this section, outer-garments means a garment worn over other garments and does not include garments like underwear, bras, lingerie or swimsuits.

(i) No person shall enter, be, or remain in any part of a massage business while in possession of an open container of alcohol, or consuming or using any alcoholic beverage or drugs except pursuant to a prescription for such drugs. The owner, operator, responsible managing employee, or manager shall not permit any such person to enter or remain upon such premises.

(j) No massage business shall operate as a school of massage, or use the same facilities as that of a school of massage.
(k) No massage business shall place, publish or distribute, or cause to be placed, published or distributed any advertising matter that depicts any portion of the human body that would reasonably suggest to prospective clients that any service is available other than those services listed as an available service pursuant to section 5-19.05(b), nor shall any massage business employ language in the text of such advertising that would reasonably suggest to a prospective client that any service is available other than those services as described in compliance with the provisions of this chapter.

(l) No massage shall be given unless the client’s genitals are, at all times, fully covered. A massage practitioner shall not, in the course of administering any massage, make physical contact with the genitals, or anus of any other person regardless whether the contact is over or under the persons clothing. Providing massage of female breasts without the written consent of the person receiving the massage and a referral from a licensed California health care provider is prohibited.

(m) Where the business has staff available to assure security for clients and massage staff are behind closed doors, the entry to the reception area of the massage business shall remain unlocked during business hours when the business is open for business or when clients are present.

(n) No massage business located in a building or structure with exterior windows fronting a public street, highway, walkway, or parking area shall, during business hours, block visibility into the interior reception and waiting area through the use of curtains, closed blinds, tints, or any other material that obstructs, blurs, or unreasonably darkens the view into the premises. For the purpose of this sub-section, there is an irrebuttable presumption that the visibility is impermissibly blocked if more than 10 percent of the interior reception and waiting area is not visible from the exterior window.

(o) All signs shall be in conformance with the current ordinances of the City.

(p) Minimum lighting consisting of at least one (1) artificial light of not less than forty (40) watts shall be provided and shall be operating in each room or enclosure where massage services are being performed on clients, and in all areas where clients are present.

(q) Ventilation shall be provided in accordance with applicable building codes and regulations.
(r) Hot and cold running water shall be provided at all times.

(s) Adequate dressing, locker and toilet facilities shall be provided for clients.

(t) A minimum of one (1) wash basin for employees shall be provided at all times. The basin shall be located within or as close as practicable to the area devoted to performing of massage services. Sanitary towels shall also be provided at each basin.

(u) Pads used on massage tables shall be covered with material acceptable to the health officer.

(v) All massage businesses shall comply with all state and federal laws and regulations for handicapped clients.

(w) A massage practitioner shall operate only under the name specified in his or her CAMTC certificate. A massage business shall operate only under the name specified in its City registration certificate.

(x) No massage business shall allow any person to reside within the massage business or in attached structures owned, leased or controlled by the massage business.

(y) Other than custodial or maintenance staff, no persons shall be permitted within the premises of a massage business between the hours of 11:00 p.m. and 6:00 a.m.

5-19.06 INSPECTION BY OFFICIALS.

The investigating and enforcing officials of the City, including, but not limited to, the police, code enforcement, health officer and director of building and planning, or designees, shall have the right to enter the premises from time to time during regular business hours for the purpose of making reasonable inspections to observe and enforce compliance with building, fire, electrical, plumbing or health regulations, and to enforce compliance with applicable regulations, laws, and statutes, and with the provisions of this chapter. The City may charge a fee for any safety inspections to cover the cost of the inspection.

5-19.07 NOTIFICATIONS.
(a) A massage business shall notify the certification officer, or his or her
designee, of any changes described in Section 5-19.04 pursuant to the timelines
specified therein.

(b) A registrant shall report to the certification officer any of the following within
96 hours of the occurrence:

(1) arrests of any employees or owners of the registrant’s massage
business for an offense other than a misdemeanor traffic offense;
(2) resignations, terminations, or transfers of practitioners employed by the
registrant’s massage business;
(3) any event involving the registrant’s massage business or the massage
practitioners employed therein that constitutes a violation of this ordinance or
state or federal law.

(c) This provision requires reporting to the certification officer even if the
massage business believes that the certification officer has or will receive the
information from another source.

5-19.08 EXEMPTIONS.

(a) The provisions of this chapter shall not apply to the following classes of
individuals or businesses while engaged in the performance of their duties:

(1) Physicians, surgeons, chiropractors, osteopaths, nurses or any
physical therapists who are duly licensed to practice their respective professions
in the State of California and persons working directly under the supervision of or
at the direction of such licensed persons, working at the same location as the
licensed person, and administering massage services subject to review or
oversight by the licensed person.

(2) Barbers and beauticians who are duly licensed under the laws of the
State of California while engaging in practices within the scope of their licenses,
except that this provision shall apply solely to the massaging of the neck, face
and/or scalp, hands or feet of the clients.
(3) Hospitals, nursing homes, mental health facilities, or any other health facilities duly licensed by the State of California, and employees of these licensed institutions, while acting within the scope of their employment.

(4) Accredited high schools, junior colleges, and colleges or universities whose coaches and trainers are acting within the scope of their employment.

(5) Trainers of amateur, semi-professional or professional athletes or athletic teams while engaging in their training responsibilities for and with athletes; and trainers working in conjunction with a specific athletic event.

(6) Individuals administering massages or health treatment involving massage to persons participating in single-occurrence athletic, recreational or festival events, such as health fairs, road races, track meets, triathlons and other similar events; provided, that all of the following conditions are satisfied:

(A) The massage services are made equally available to all participants in the event;

(B) The event is open to participation by the general public or a significant segment of the public such as employees of sponsoring or participating corporations;

(C) The massage services are provided at the site of the event and either during, immediately preceding or immediately following the event;

(D) The sponsors of the event have been advised of and have approved the provisions of massage services;

(E) The persons providing the massage services are not the primary sponsors of the event.

5-19.09 VIOLATION; PENALTIES; UNLAWFUL BUSINESS PRACTICES MAY BE ENJOINED; REMEDIES CUMULATIVE.

Unless otherwise exempted by the provisions of this chapter, every person, whether acting as an individual, owner, employee or agent of the owner, or operator who gives massages or conducts a massage business in violation of this chapter shall be guilty of a misdemeanor. The City Attorney may reduce the penalty to an infraction.
Any massage business operated, conducted, or maintained contrary to the provisions of this chapter shall constitute an unlawful business practice pursuant to Business & Professions Code Section 17200 et seq., and the City Attorney or District Attorney may, in the exercise of discretion, in addition to or in lieu of taking any other action permitted by this chapter, commence an action or actions, proceeding or proceedings in the Superior Court of San Mateo County, seeking an injunction prohibiting the unlawful business practice and/or any other remedy available at law, including but not limited to fines, attorneys’ fees and costs. All remedies provided for in this chapter are cumulative.

5-19.10 ADMINISTRATIVE FINES.

(a) Violations. Upon a finding by the certification officer that a business has violated any provision of this chapter, the certification officer may issue an administrative fine of up to the amount as specified by resolution of the City Council.

(b) Separate Violations. Each violation of any provision of this chapter shall constitute a separate violation. Each client to whom massage is provided or offered in violation of this chapter shall also constitute a separate violation. Each day upon which a massage business remains open for business in violation of this chapter shall also constitute a separate violation.

(c) Fine Procedures. Notice of the fine shall be served by certified mail with the legal violation and supporting facts. The notice shall contain an advisement of the right to file an appeal with the hearing officer contesting the imposition of the fine.

(d) Appeals. Appeals must be requested in writing, and shall provide facts disputing the violation and may be accompanied by declarations and exhibits. Appeals must be addressed to the hearing officer, and must be received within ten (10) days of the date appearing on the notice of the fine and a copy of the appeal and any supporting materials must be sent to the certification officer, who may respond to the appeal in writing within ten (10) days of receipt of the appeal and may provide additional evidence in support of the fine. The hearing officer may request, in writing, additional evidence from either the Appellant or the certification officer. The decision of the hearing officer shall be based solely on the materials submitted by the Appellant and the
certification officer and be provided by certified mail. The hearing officer may sustain the fine, overrule the fine or decrease the amount of the fine. However the total fine shall not be reduced below the minimum amount as specified by resolution of the City Council. The decision will constitute a final administrative order with no additional administrative right of appeal.

(e) Failure to Pay Fine. If said fine is not paid within thirty (30) days from the date appearing on the notice of the fine or of the notice of determination from the hearing officer after the decision, the fine may be referred to a collection agency within or external to the City. In addition, any outstanding fines must be paid prior to the issuance or renewal of any registration.

5-19.11 DENIAL, SUSPENSION AND REVOCATION OF CITY REGISTRATION CERTIFICATES

(a) Reasons. City registration certificates may be denied, suspended or revoked by the certification officer upon finding any of the following grounds:

(1) A massage practitioner is no longer in possession of current and valid CAMTC-certification. This subsection shall apply to a sole proprietor or a person employed or used by a massage business to provide massage.

(2) An owner or sole proprietor: is required to register under the provisions of California Penal Code section 290 (sex offender registration); is convicted of California Penal Code sections 266i (pandering), 315 (keeping or residing in a house of ill-fame), 316 (keeping disorderly house), 318 (prevailing upon person to visit a place for prostitution), 647(b) (engaging in or soliciting prostitution), 653.22 (loitering with intent to commit prostitution), 653.23 (supervision of prostitute); has a business permit or license denied, revoked, restricted, or suspended by any agency, board, city, county, territory, or state; is subject to an injunction for nuisance pursuant to California Penal Code sections 11225-11235 (red light abatement); is convicted of a felony offense involving the sale of a controlled substance; is convicted of any crime involving dishonesty, fraud, deceit, violence, or moral turpitude; or is convicted in any other state of an
offense which, if committed in this state, would have been punishable as one or more referenced offenses in this subdivision.

(3) The City determines that a material misrepresentation was included on the application for a certificate of registration or renewal.

(4) Violations of any of the following occurred on the premises of a massage business or were committed by a massage practitioner: California Business and Professions Code sections 4600 et seq.; any local, state, or federal law; or the provisions of this chapter.

(b) Procedures. Written notice of the denial, suspension or revocation shall be served on the sole proprietor or owners by certified mail with the legal violation and supporting facts. The notice shall contain an advisement of the right to request an appeal hearing before the hearing officer.

(c) Time Period of Suspension. The certification officer may suspend a City registration certificate for a period between five (5) days and the end of the license term, at his or her discretion.

(d) Effective Date of Suspension or Revocation. Suspension or revocation issued pursuant to subsection (b) will be effective ten (10) days from the date appearing on the order, unless a timely appeal is filed in accordance with subsection (e).

(e) Appeal.

(1) The decision of the certification officer is appealable to the hearing officer.

(2) An appeal must be in writing, and be hand-delivered or mailed to the hearing officer.

(3) An appeal must be received by the hearing officer on or before the effective date of suspension or revocation provided by subsection (d).

(4) The filing of a timely appeal will stay a suspension or revocation pending a decision on the appeal by the hearing officer.

(5) A hearing shall be scheduled before the hearing officer within thirty (30) days. Either the Appellant or the certification officer may request, in writing directed to the hearing officer, a continuance of the hearing. Such requests must be supported by good cause. The decision whether to grant a continuance is at
the discretion of the hearing officer, who shall consider whether granting the continuance poses a threat to public health or safety in light of the severity of the violations alleged.

(6) The decision of the hearing officer shall be a final administrative order, with no further administrative right of appeal or reconsideration. The hearing officer may sustain a denial, suspension or revocation, overrule a denial, suspension or revocation, reduce a revocation to a suspension and/or reduce the length of a suspension. However no revocation or suspension shall be reduced to a length of less than a five day suspension. Further the hearing officer may stay the effective date of any suspension for a reasonable time following a hearing.

(f) Reapplication. No reapplication will be accepted within one (1) year after a certificate is revoked.

(g) Evidence. The following rules shall apply to any hearing required by this section. All parties involved shall have the right to offer testimonial, documentary, and tangible evidence bearing on the issues, to be represented by counsel, and to confront and cross-examine witnesses. Any relevant evidence may be admitted if it is the sort of evidence upon which reasonable persons are accustomed to rely in the conduct of serious affairs. Formal rules of evidence and discovery do not apply to proceedings governed by this chapter. Unless otherwise specifically prohibited by law, the burden of proof is on the registrant in any hearing or other matter under this chapter.

5-19.12 HOME OCCUPATION AND MOBILE MASSAGE

(a) Subsections c, f, i, m, n, o, p, q, r, s, t, v, x, and y of Section 5-19.05 of this chapter shall not apply when a massage practitioner is providing mobile massage services.

(b) Where a massage business is a home occupation, and the operator has complied with Section 9-4.3101 of this code pertaining to home occupations, Subsections f, i, m, n, q, t, x, and y of Section 5-19.05 of this chapter related to businesses operating from a commercial location shall not apply.
5-19.13 PUBLIC NUISANCE
It shall be unlawful and a public nuisance for a massage business to be operated, conducted, or maintained contrary to the provisions of this chapter. The City may exercise its discretion, in addition to or in lieu of prosecuting a criminal action, to commence proceedings for the abatement, removal, and enjoinment of that business in any manner provided by law.

SECTION 4. SEVERABILITY. If any provision(s) of this ordinance is declared invalid by a court of competent jurisdiction, it is the intent of the City Council that such invalid provision(s) be severed from the remaining provisions of the ordinance so that regulation and control of massage may remain in place.

SECTION 5. CEQA. This ordinance is exempt from the provisions of the California Environmental Quality Act because it is not a project and because there is no possibility that the ordinance may have a significant effect on the environment.

SECTION 6. This ordinance shall be effective thirty (30) days from the date of passage thereof.

SECTION 7. The City Clerk shall publish this ordinance according to law.

* * * * * * *

Introduced at a regular City Council meeting held on August 8, 2016. PASSED AND ADOPTED this 12th day of September, 2016, by the following vote:

AYES, Councilmembers:
NOES, Councilmembers:
ABSTAIN, Councilmembers:
ABSENT, Councilmembers:

_________________________
Sue Digre, Mayor

ATTEST:
Adopted (ID # 2010) at 9/12/2016 7:00 PM City Council Regular Meeting

RESULT: ADOPTED BY CONSENT VOTE [UNANIMOUS]
MOVER: Mike O'Neill, Mayor Pro Tem
SECONDER: Karen Ervin, Councilmember
AYES: Digre, O'Neill, Ervin, Nihart, Keener
None.
SUBJECT:

Resolution of the City Council of the City of Pacifica Authorizing Staff to Execute a Contract with the County of San Mateo Human Services Agency to Provide Out-Of-School STEM Hands-On Learning for Elementary/Middle School Youth (Award of Funding in the Amount of $27,720).

RECOMMENDED ACTION:

Move to approve a “Resolution of the City Council of the City of Pacifica authorizing staff to execute a contract with the County of San Mateo Human Services Agency to provide Out-of-School STEM Hands-on Learning for Elementary/Middle School Youth.”

STAFF CONTACT:

Michael Perez - (650) 738-7381
perezm@ci.pacifica.ca.us

BACKGROUND/DISCUSSION:

From 2011 to 2015, the City of Pacifica has submitted a grant proposal on behalf of the San Mateo County Community STEM Alliance (SMCCSA) and been selected to receive grant funding four times.

The County requested proposals for 2016/2017 STEM programming in June of 2016 and Pacifica’s Parks, Beaches and Recreation (PB&R) Department applied for funds on behalf of the Pacifica Afterschool STEM Program, which is collaboration between Pacifica PB&R, the Pacifica School District and Learningtech.org. On June 27, 2016, staff received notice that the proposal was chosen for grant funding in the amount of $27,720.

THE GRANT REQUIRES A 50% IN-KIND MATCH OF THESE FUNDS. AN IN-KIND MATCH MAY BE A COMBINATION OF MONETARY, PERSONNEL, FACILITY, OR OTHER RESOURCES GIVEN BY PROVIDERS NECESSARY FOR THE PROPOSED PROGRAM. THE PACIFICA SCHOOL DISTRICT HAS AGREED TO CONTINUE TO PROVIDE SPACE AS WELL AS SUPPORT FOR EVALUATIONS AND ASSESSMENTS FOR THE PACIFICA PROGRAMS. THERE WILL ALSO BE SIMILAR IN-KIND SUPPORT CONTRIBUTED BY LEARNINGTECH.ORG. IT IS ANTICIPATED THAT THE IN-KIND SUPPORT WILL EXCEED THE REQUIRED 50% MATCH, AS IT HAS FOR EACH OF THE PAST YEARS THE GRANT WAS RECEIVED. APPROXIMATELY 9% OF THE FUNDS WILL BE ALLOCATED FOR ADMINISTRATIVE COSTS, WHICH WILL GO TO PACIFICA AS THE LEAD FISCAL AGENT. THE MAJORITY OF THE FUNDS RECEIVED WILL BE SPENT ON THE ACTUAL DELIVERY OF SERVICES INCLUDING STAFF DEVELOPMENT, MATERIALS, AND EQUIPMENT AND INSTRUCTOR TIME.

FISCAL IMPACT:
Increase in revenues by $27,720 in the STEM Grant SMC account, number 01-46880-0000-010, accompanied by an increase in expenditures in the Contractual Services STEM Grant Elementary SMC account, number 01-800810-52800-010, of $25,225. The difference will be retained for allowable administrative costs.

**ORIGINATED BY:**

Parks, Beaches & Recreation Department

**ATTACHMENT LIST:**

Pacifica_STEM1617contractorSig (PDF)
RESOLUTION NO. (ID # 2016)

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PACIFICA AUTHORIZING STAFF TO EXECUTE A CONTRACT WITH THE COUNTY OF SAN MATEO HUMAN SERVICES AGENCY TO PROVIDE OUT-OF-SCHOOL STEM HANDS-ON LEARNING FOR ELEMENTARY/MIDDLE SCHOOL YOUTH.

WHEREAS, the City of Pacifica is a municipal corporation and general law city, duly organized and existing under the Constitution and laws of the State of California; and
WHEREAS, the City Council of the City of Pacifica is interested in identifying and obtaining sources of funding for community programs; and
WHEREAS, the City responded to the County of San Mateo Human Services Agency’s request for proposals for After School Science, Technology, Engineering, Math (STEM) Hands-on Learning for Elementary/Middle School Youth Programming; and
WHEREAS, the City submitted a proposal and was awarded funding;
NOW, THEREFORE, IT IS HEREBY RESOLVED that the City Council of the City of Pacifica does hereby authorize staff to execute a contract with the County of San Mateo Human Services Agency to provide out-of-school STEM hands-on learning for elementary/middle school youth, designates the Parks, Beaches and Recreation Department Director as the City’s contact person, authorizes the City manager as signatory and to execute agreements and take other actions necessary to facilitate the proposed program.

Passed and adopted by the City Council of the City of Pacifica at their meeting of September 12, 2016 by the following vote of the members thereof:

AYES, Councilmembers:
NOES, Councilmembers:
ABSENT, Councilmembers:
ABSTAIN, Councilmembers:

____________________________________
Sue Digre, Mayor

APPROVED AS TO FORM:

ATTEST:

____________________________________
Michelle Marchetta Kenyon, City Attorney

Kathy O’Connell, City Clerk
GRANT AGREEMENT
BETWEEN THE COUNTY OF SAN MATEO AND THE CITY OF PACIFICA

This Agreement is entered into this 12th day of September, 2016, by and between the County of San Mateo, a political subdivision of the state of California, hereinafter called “County,” and the City of Pacifica, hereinafter called “Grantee.”

WHEREAS, Grantee has applied to County seeking a grant for the purpose of funding the matters set forth in its project described in Exhibit A (the “Project”);

WHEREAS, County has approved the grant of certain funds to Grantee pursuant the terms set forth in this Agreement;

NOW, THEREFORE, it is agreed by the parties to this Agreement as follows:

1. **Exhibits and Attachments**

The following exhibits and attachments are attached to this Agreement and incorporated into this Agreement by this reference:

   - Exhibit A—Project Description
   - Exhibit B—Budget
   - Exhibit C—Child Abuse Prevention and Reporting
   - Attachment A—Fingerprinting
   - Attachment I—§ 504 Compliance

2. **Grant**

County hereby grants to Grantee a sum not to exceed **TWENTY SEVEN THOUSAND SEVEN HUNDRED TWENTY DOLLARS** ($27,720) in consideration of and on the condition that the sum be expended for the sole purpose of carrying out the objectives of Grantee’s Project, and in no event shall the County’s total fiscal obligation under this Agreement exceed this amount. Grantee agrees to assume any obligation to secure and furnish any additional funds that may be necessary to carry out its Project.

Funds granted under this Agreement shall not be disbursed until execution of this Agreement by County and Grantee.

County shall disburse grant funds to Grantee upon receipt of invoices. Invoices should be accompanied by back up documentation (receipts for supplies, salary, and benefits back up) and submittal of required summary reports outlined in Exhibit A. County reserves the right to change the disbursement method during the term of this Agreement.

County and Grantee anticipate the disbursement schedule to be as follows:

- **Payment 1** – Invoice of actual costs incurred based on rates in Exhibit B in an amount not to exceed $13,860 with back up documentation and summary report due 11/30/2016.
• **Payment 2** – Invoice of actual costs incurred based on rates in Exhibit B in an amount not to exceed the combined sum of $22,176 for Payment 1 and Payment 2 with back up documentation and summary report due 2/28/2017.

• **Payment 3** – Invoice of actual costs incurred based on rates in Exhibit B for the remaining amount for the grant, an amount not to exceed $27,720, with back up documentation and final summary report due 6/5/2017.

Invoices should be submitted to the attention of Josie Yu, County of San Mateo, Human Services Agency, STEM Education, 1 Davis Drive, Belmont, CA 94002, Phone 650-508-6784. Email: JVYu@smcgov.org

3. **Term & Termination**

Subject to compliance with all terms and conditions, the term of this Agreement shall begin on the date of execution by the parties through June 30, 2017. This Agreement shall not automatically renew, nor shall it create any reliance on the possibility of future grants.

County may terminate this Agreement based upon the unavailability of Federal, State, or County funds by providing written notice to Grantee within a reasonable time after County learns of said unavailability of funding. Grantee acknowledges that this Agreement may be subject to approval of the Board of Supervisors, and assumes all risk of possible non-appropriation and non-approval of funds.

County may suspend and/or terminate this Agreement if Grantee fails to comply with the terms of this Agreement and may, in its sole discretion, withhold or cancel pending and future disbursements of grant funds and/or require Grantee to return some or all funds disbursed under this Agreement.

4. **Relationship of Parties**

Notwithstanding any publicity or other references to County required to be made in connection with the Project, Grantee understands and agrees that the Project performed under this Agreement is not performed by Grantee as an independent contractor of the County or as an employee of County and that neither Grantee nor its employees acquire any of the rights, privileges, powers, or advantages of County contractors or County employees. Grantee acknowledges and agrees that it is not, and will not hold itself out as, an agent, partner, or co-venture of the County, and that this Agreement is not intended and does not create an agency, partnership, joint venture between the parties.

5. **Project Administration**

The parties agree that the Project shall not be altered without a written amendment to this Agreement, signed by both County and Grantee. Grantee shall provide written reports to the County’s authorized representative in accordance with Exhibit A.

6. **Hold Harmless**

Grantee shall indemnify and save harmless County and its officers, agents, employees, and servants from all claims, suits, or actions of every name, kind, and description resulting from this Agreement, the performance of any work or services performed by Grantee in furtherance of the Project under this Agreement, or payments made pursuant to this Agreement brought for, or on account of, any of the following:
(A) injuries to or death of any person, including Grantee or its employees/officers/agents/volunteers;

(B) damage to any property of any kind whatsoever and to whomsoever belonging;

(C) any sanctions, penalties, or claims of damages resulting from Grantee’s failure to comply with any applicable federal, state, or local laws or regulations; or

(D) any other loss or cost, including but not limited to that caused by the concurrent active or passive negligence of County and/or its officers, agents, employees, or servants. However, Grantee’s duty to indemnify and save harmless under this Section shall not apply to injuries or damages for which County has been found in a court of competent jurisdiction to be solely liable by reason of its own negligence or willful misconduct.

The duty of Grantee to indemnify and save harmless as set forth by this Section shall include the duty to defend as set forth in Section 2778 of the California Civil Code.

7. **Insurance**

   a. **General Requirements**

Prior to its receipt of any funds pursuant to this Grant, Grantee shall obtain all insurance required under this Section and such insurance shall be subject to the approval by County’s Risk Management, and Grantee shall use diligence to obtain such insurance and such approval. Grantee shall furnish County with certificates of insurance evidencing the required coverage, and there shall be a specific contractual liability endorsement extending Grantee’s coverage to include the contractual liability assumed by Grantee pursuant to this Agreement. These certificates shall specify or be endorsed to provide that thirty (30) days’ notice must be given, in writing, to County of any pending change in the limits of liability or of any cancellation or modification of the policy.

   b. **Workers’ Compensation and Employer’s Liability Insurance**

Grantee shall have in effect during the entire term of this Agreement workers’ compensation and employer’s liability insurance providing full statutory coverage. In signing this Agreement, Grantee certifies, as required by Section 1861 of the California Labor Code, that (a) it is aware of the provisions of Section 3700 of the California Labor Code, which require every employer to be insured against liability for workers’ compensation or to undertake self-insurance in accordance with the provisions of the Labor Code, and (b) it will comply with such provisions before commencing or continuing the performance of Project work for which it would receive grant funds.

   c. **Liability Insurance**

Grantee shall take out and maintain during the term of this Agreement such bodily injury liability and property damage liability insurance as shall protect Grantee and all of its employees/officers/agents while performing work covered by this Agreement from any and all claims for damages for bodily injury, including accidental death, as well as any and all claims for property damage which may arise from Grantee’s operations under this Agreement, whether such operations be by Grantee, any subcontractor, anyone directly or indirectly employed by either of them, or an agent of either of them. Such insurance shall be combined single limit bodily injury and property damage for each occurrence and shall not be less than the amounts specified below:
8. **Assignability and Subcontracting**

Grantee shall not assign this Agreement or any portion of it to a third party. Except as set forth in Exhibit A, Grantee shall not subcontract with a third party to perform the Project. Any such assignment or subcontract without County’s prior written consent shall give County the right to automatically and immediately terminate this Agreement without penalty or advance notice and County shall have the right to a refund of all funds disbursed under this Agreement.

9. **Compliance With Laws**

All services to be performed by Grantee in connection with the Project shall be performed in accordance with all applicable Federal, State, County, and municipal laws, ordinances, and regulations. In connection with the Project, Grantee bears responsibility to obtain, at Grantee’s expense, any license, permit, or approval required from any agency.

10. **Merger Clause; Amendments**

This Agreement, including Exhibits and Attachments, constitutes the sole Agreement of the parties regarding the Grant, and correctly states the rights, duties, and obligations of each party as of this document’s date. In the event that any term, condition, provision, requirement, or specification set forth in the body of this Agreement conflicts with or is inconsistent with any term, condition, provision, requirement, or specification in any Exhibit and/or Attachment to this Agreement, the provisions of the body of the Agreement shall prevail. Any prior agreements, promises, negotiations, or representations between the parties concerning the Grant that are not expressly stated in this document are not binding. All subsequent modifications or amendments shall be in writing and signed by the parties.

11. **Controlling Law; Venue**
The validity of this Agreement and of its terms, the rights and duties of the parties under this Agreement, the interpretation of this Agreement, the performance of this Agreement, and any other dispute of any nature arising out of this Agreement shall be governed by the laws of the State of California without regard to its choice of law or conflict of law rules. Any dispute arising out of this Agreement shall be venued either in the San Mateo County Superior Court or in the United States District Court for the Northern District of California.

12. Notices

Any notice, request, demand, or other communication required or permitted under this Agreement shall be deemed to be properly given when both: (1) transmitted email to the email address listed below; and (2) sent to the physical address listed below by either being deposited in the United States mail, postage prepaid, or deposited for overnight delivery, charges prepaid, with an established overnight courier that provides a tracking number showing confirmation of receipt.

In the case of County, to:  
Name/Title: Josie Yu  
Human Services Agency  
STEM Education Coordinator  
Address: 1 Davis Drive  
Belmont, CA 94002  
Telephone: 650-508-6784  
Email: JYYu@smcgov.org

In the case of Grantee, to:  
Name/Title: Michael Perez  
Director of Parks, Beaches & Recreation  
Address: 170 Santa Maria Avenue  
Pacifica, CA 94044  
Telephone: 650-738-7382  
Email: perezm@ci.pacifica.ca.us

13. Electronic Signature

If both County and Grantee wish to permit this Agreement and future documents relating to this Agreement to be digitally signed in accordance with California law and County’s Electronic Signature Administrative Memo, both boxes below must be checked. Any party that agrees to allow digital signature of this Agreement may revoke such agreement at any time in relation to all future documents by providing notice pursuant to this Agreement.

For County: ☒ If this box is checked by County, County consents to the use of electronic signatures in relation to this Agreement.

For Grantee: ☒ If this box is checked by Grantee, Grantee consents to the use of electronic signatures in relation to this Agreement.

*   *   *
THIS AGREEMENT IS NOT VALID UNTIL SIGNED BY ALL PARTIES. NO FUNDS WILL BE DISTRIBUTED UNTIL THIS DOCUMENT HAS BEEN SIGNED BY THE COUNTY’S AUTHORIZED DESIGNEE.

For Grantee:

______________________________  __________________
(signature)                      Date                      City of Pacifica
Authorized Representative       Name of Grantee
Grantee

______________________________
(please print name)
Authorized Representative
Grantee

For County:

______________________________  ________________
(Signature)                     Date                     Director, Human Services Agency
Authorized Designee             Job Title (please print)
County of San Mateo

Iliana Rodriguez
______________________________
(please print name)
Authorized Designee
County of San Mateo

Budget Unit
Exhibit A - Project Description

County and Grantee agree that the grant funds pursuant to this Agreement shall only be used to further the goals of the following Project:

Grantee will be allowed to collaborate and subcontract with The Miller Institute dba Learningtech.org (‘Learningtech.org”) to accomplish the goals set forth in this Exhibit.

Learningtech.org will deliver 10 STEM modules throughout the 2016-17 academic year to a total of 180 elementary and middle school youth in afterschool programs.

I. Scope of Work

A. Elementary School Design (Grades 3-5)

The following sequence would be typical for a location receiving the maximum three (3) units of service. There is flexibility to adapt topics and sequencing to local interests and better align them with in-class activities. Topics and associated materials include:

1. **Coding**: Curriculum consists of a blend from Code.org and MIT’s Scratch. Students move through a progression of specific skills to work on independent projects in the final weeks of the workshop. Topics/materials include:
   - Code.org
   - Scratch/SNAP11 coding

2. **Robotics**: Students are introduced to construction and programming of mobile robots for skills development featuring age-appropriate robots, building toward Lego Mindstorms. Design challenge or local challenge activities are provided in the final weeks of the workshop. Topics/materials include:
   - WeDo robotics
   - Thymio robotics (visual, rule-based programming)
   - Finch robotics using Scratch
   - Cubelets

3. **Making**: Construction materials such as Roominate are used periodically in activities to encourage design thinking. Topics/materials include:
   - Roominate (which has been shown to encourage more girls to participate)
B. Middle School Design (Grades 6---8)

Makerspaces, are creative, Do It Yourself (DIY) spaces where people can gather to create, invent, and learn. In libraries they often have 3D printers, software, electronics, craft and hardware supplies and tools. A Maker Space will be established at a middle school that will be shared between the in-school and afterschool STEM teachers or staff.

Topics and associated materials include:

1. **Coding**: Students advance from MIT’s Scratch or Berkeley’s SNAP toward text-based languages and simulations. Students move through a progression of specific skills to work on independent projects in the final weeks of the workshop. Topics/materials include:
   - Scratch/SNAP coding
   - Python programming
   - StarLogo Nova / NetLogo Science Simulations
   - Web Design/HTML/Javascript, as time permits

2. **Robotics**: Students are introduced to construction and programming of mobile robots for engineering skills development. Design challenge or local challenge activities are provided in the second half of each unit. Topics/materials include:
   - Lego Mindstorms robotics
   - Thymio II robotics (textual, rule-based programming)
   - Finch robotics using Python

3. **Making**: Construction materials such as microprocessors and 3D printing are used periodically in activities to encourage students to engage in design thinking. Topics/materials include:
   - Roominate (encouraging more girls to participate, even for older age groups)
   - 3D Design and Printing (design challenges, such as architectural design for Mars colony)
   - Computer hardware/software, from voltages to bits to boards: Arduino/Raspberry
II. Reporting Requirements

Two high level goals of the program are: 1. to inspire youth to be comfortable and engaged in STEM hands-on projects 2. To build STEM skills and habits that increase youth confidence and content knowledge.

A. Mid-Year Narrative - To be submitted to the Human Services Agency (HSA) by February 14, 2017:

Narrative includes the following data:

- Demographic information of youth enrolled in the program: ethnicity, gender, age
- Compile and summarize results of pre and post elementary school age youth surveys
- Compile and summarize results of pre and post middle school age youth surveys
- Describe how the collaboration with in-school teachers allowed connection between the science and/or math content and STEM projects after school
- Summary and description of number of STEM badges awarded to youth
- Analysis of what went well with the Project and what improvements or expansions could be made to the Project based on first quarter results

B. End of Year Reporting - To be submitted to HSA by July 31, 2017

- Total number of youth enrolled.
- Demographic information of youth enrolled in the program: ethnicity, gender, age, free/reduced lunch, and English Language Learners (if available)
- Compilation and summary of results of pre and post elementary school age youth surveys
- Compilation and summary of results of pre and post middle school age youth surveys
- Results from in-school teacher survey regarding STEM afterschool program
- Submit examples of elementary and middle school youth Coding, Robotic, Maker projects. (All forms of submission will be accepted; video, including articles and pictures)
- Analysis of what went well with the project and what improvements or expansions could be made to the program

III. Program Training

County will provide the 2016-17 STEM grantees with tools to evaluate their programs and promote youth hands-on and minds-on STEM learning. Learningtech.org will select a maximum of two individuals from their organization who can attend a two day Dimensions Of Success (DoS) online training. Trainees will evaluate two other STEM out-of-school awarded programs using DoS tools during the 2016-17 academic year as part of the DoS certification process. The timeline for DoS training and discussions is as follows:

- Fall 2016- Completion of DoS course
- Winter- February 2017- Meeting to discuss DoS tools
- Spring- May 2017 - Meeting to discuss DoS evaluation
### Exhibit B – Budget

**STEM Module**: 9 Weeks. One 90 Minute Session / Week  
**Total Modules**: 10

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**Total Modules**: 10  
**Students per Module**: 18  
**Sessions per Module**: 9  
**Cost per Student in Module**: $154  
**Cost per Module**: $2,772

**Grant Total**: $27,720
Exhibit C - Child Abuse Prevention and Reporting

Grantee agrees to ensure that all known or suspected instances of child abuse or neglect are reported to a child protective agency. Contractor agrees to fully comply with the Child Abuse and Neglect Reporting Act, Cal Pen Code 11164 et seq. Contractor will ensure that all known or suspected instances of child abuse or neglect are reported to an agency (police department, sheriff’s department, county probation department if designated by the county to receive mandated reports, or the county welfare department) described in Penal Code Section 11165.9. This responsibility shall include:

A. Requiring that all employees, consultants, or agents performing services under this Agreement who are required by the Penal Code to report child abuse or neglect, sign a statement that he or she knows of the reporting requirement and will comply with it.

B. Establishing procedures to ensure reporting even when employees, consultants, or agents who are not required to report child abuse under the Penal Code learn, or reasonably suspect, that a child has been a victim of abuse or neglect.

C. Agreeing that its employees, subcontractors, assignees, volunteers, and any other persons who provide services under this contract and who will have supervisory or disciplinary power over a minor or any person under his or her care (Penal 11105.3) will be fingerprinted in order to determine whether they have a criminal history which would compromise the safety of children with whom Contractor’s employees, subcontractors, assignees or volunteers have contact. All fingerprinting services will be at County’s sole discretion and Contractor’s sole expense.
DATE: 8/4/2016

AGREEMENT WITH: City of Pacifica

FOR: Afterschool STEM program for youth.

Contractor agrees that its employees and/or its subcontractors, assignees and volunteers who, during the course of performing services under this agreement, have contact with children will be fingerprinted in order to determine whether they have a criminal history which would compromise the safety of children with whom contractors employees, assignees and subcontractors or volunteers have contact.

NAME:

TITLE:

SIGNATURE:

DATE:
ATTACHMENT I
Assurance of Compliance with Section 504 of the Rehabilitation Act of 1973, as Amended

The undersigned (hereinafter called "Contractor(s)") hereby agrees that it will comply with Section 504 of the Rehabilitation Act of 1973, as amended, all requirements imposed by the applicable DHHS regulation, and all guidelines and interpretations issued pursuant thereto.

The Contractor(s) gives/give this assurance in consideration of for the purpose of obtaining contracts after the date of this assurance. The Contractor(s) recognizes/recognize and agrees/agree that contracts will be extended in reliance on the representations and agreements made in this assurance. This assurance is binding on the Contractor(s), its successors, transferees, and assignees, and the person or persons whose signatures appear below are authorized to sign this assurance on behalf of the Contractor(s).

The Contractor(s): (Check a or b)
☐ a. Employs fewer than 15 persons.
☐ b. Employs 15 or more persons and, pursuant to section 84.7 (a) of the regulation (45 C.F.R. 84.7 (a), has designated the following person(s) to coordinate its efforts to comply with the DHHS regulation.

Name of 504 Person: ____________________________

Name of Contractor(s): City of Pacifica

Street Address or P.O. Box: 170 Santa Maria Avenue

City, State, Zip Code: Pacifica, CA 94044

I certify that the above information is complete and correct to the best of my knowledge

Signature: ____________________________

Title of Authorized Official: ____________________________

Date: ____________________________

*Exception: DHHS regulations state that: "If a recipient with fewer than 15 employees finds that, after consultation with a disabled person seeking its services, there is no method of complying with (the facility accessibility regulations) other than making a significant alteration in its existing facilities, the recipient may, as an alternative, refer the handicapped person to other providers of those services that are accessible."
SUBJECT:

Amendment No. 1 to the Consultant Services Agreement Between the City of Pacifica and Terraphase Engineering in the Amount of $24,500 for Additional Environmental Impact Evaluation Necessary to Complete the Environmental Phase of the Waste Water Equalization Basin Project.

RECOMMENDED ACTION:

Approve Amendment No. 1 to the Consultant Services Agreement Between the City of Pacifica and Terraphase Engineering in the amount of $24,500 to perform additional environmental impact evaluation to complete the environmental phase of the Waste Water Equalization Basin Project; and authorize the City Manager to execute contract amendments not to exceed $40,000.

STAFF CONTACT:

Maria Aguilar - (650) 738-4664
aguilarm@ci.pacifica.ca.us

BACKGROUND/DISCUSSION:

On November 9, 2015, the City Council approved the Consultant Services Agreement with Terraphase Engineering ("Terraphase") to perform environmental impact evaluation for the Waste Water Equalization Basin Project ("EQ Basin Project"), the purpose is to identify, avoid or mitigate environmental impacts as required by the California Environmental Quality Act ("CEQA").

During the evaluation, additional studies for Air Quality, Noise and Vibration, Biological Site Assessment and Preliminary Wetland Assessment were identified as necessary to support the findings of CEQA Initial Study/Mitigated Negative Declaration. These additional studies are covered in Amendment No. 1, which staff is recommending for approval.

The EQ Basin Project is currently on schedule to meet the deadline set in the Cease and Desist Order (CDO). However, to avoid unnecessary delays in the completion of the CEQA document, staff is recommending that authority be given to the City Manager to execute contract amendments not to exceed $40,000. The additional $15,500 in contingency is for any additional studies that may later be deemed also necessary.

FISCAL IMPACT:

No additional budget authority is required as enough funds have been previously approved as part of the Wastewater Capital Improvement Budget for FY 2016-17. The proposed budget for the CEQA evaluation is now as follows:
CEQA Evaluation:

CEQA Evaluation Services - Original Contract $ 49,350
CEQA Evaluation Services - CO#1 $ 24,500
Contingency $ 15,500

Total $ 89,350

ORIGINATED BY:

Waste Water Treatment
Public Works

ATTACHMENT LIST:

TerraPhase_EQBasin_CEQA_Amend#1 (PDF)
CONTRACT AMENDMENT NO. 1 TO THE CONSULTANT SERVICES AGREEMENT
DATED NOVEMBER 10, 2015 BETWEEN THE CITY OF PACIFICA AND
TERRAPHASE ENGINEERING FOR THE CEQA EVALUATION OF THE
EQUALIZATION BASIN PROJECT

This Contract Amendment is made and entered into this ______ day of September, 2016,
by and between THE CITY OF PACIFICA, a municipal corporation (hereinafter referred to
as "CITY") and TERRAPHASE ENGINEERING (hereinafter referred to as
"CONSULTANT").

RECITALS

WHEREAS, CITY requires additional CEQA EVALUATION services in connection
with the CITY OF PACIFICA EQUALIZATION BASIN PROJECT;

WHEREAS, CONSULTANT is qualified to perform such services; and

WHEREAS, CONSULTANT has agreed to provide CITY with such services on the
terms and conditions set forth herein.

NOW, THEREFORE, for the considerations hereinafter set forth, CONSULTANT and
CITY agree as follows:

ARTICLE 1 - SCOPE OF SERVICES

1.1. **Scope of Work.** CONSULTANT agrees to furnish the additional services set forth in
Exhibit A, Scope of Work, which is attached hereto and incorporated herein (the
"Services").

1.2. **Compliance with Law.** The Services shall be performed in accordance with all
applicable federal, state and local laws, ordinances, rules, regulations and orders.

1.3. **Time is of the Essence.** CONSULTANT agrees to diligently prosecute the Services. In
the performance of this Agreement, time is of the essence.

1.4. **Professional Competence.** CONSULTANT represents that it has the professional skills
necessary to perform the Services and that it will perform the Services in a skillful and
professional manner. CONSULTANT represents that it has all the necessary licenses to
perform the Services and shall maintain them throughout the term of this Agreement.
CONSULTANT agrees that the Services shall be performed in a manner consistent with
practices usual and customary to the ENVIRONMENTAL ENGINEERING profession.
CITY and CONSULTANT agree that CONSULTANT is in responsible charge of the
Services. Acceptance by CITY of the Services does not operate as a release of
CONSULTANT from professional responsibility for the Services performed.
1.5. **Independent Contractor.** CONSULTANT is an independent contractor and not an employee of CITY. CONSULTANT expressly warrants that it will not represent that it is an employee of CITY.

1.6. **Confidentiality.** CONSULTANT agrees to maintain in confidence and not disclose to any person, firm, governmental entity, or corporation, without CITY's prior written consent, any trade secret or confidential information, knowledge or data relating to the products, process, or operation of CITY. CONSULTANT further agrees to maintain in confidence and not to disclose to any person, firm, governmental entity, or corporation any data, information, technology, or material developed or obtained by CONSULTANT during the performance of the Services. The covenants contained in this Section 1.6 shall survive the termination of this Agreement for whatever cause.

1.7. **Ownership of Material.** Any reports and other material prepared by or on behalf of CONSULTANT under this Agreement (collectively, the "Documents") shall be and remain the property of CITY. All Documents not already provided to CITY shall be delivered to CITY on the date of termination of this Agreement for any reason. The Documents may be used by CITY and its agents, employees, representatives, and assigns, in whole or in part, or in modified form, for all purposes CITY may deem appropriate without further employment of or payment of any compensation to CONSULTANT.

1.8. **Documentation.** CONSULTANT shall keep and maintain full and complete documentation and accounting records, employee time sheets, and correspondence pertaining to the performance of the Services, and CONSULTANT shall make such documents available for review and/or audit by CITY and CITY's representatives at all reasonable times for at least four years after the termination of this Agreement or completion of the Services.

1.9. **Testimony.** CONSULTANT agrees to testify at CITY's request if litigation is brought against CITY in connection with the Services. Unless the action is brought by CONSULTANT or is based upon CONSULTANT's negligence, CITY will compensate CONSULTANT for the preparation and the testimony at CONSULTANT's standard hourly rates.

**ARTICLE 2 - COMPENSATION**

2.1. **Compensation.** Compensation for the Services shall be in accordance with Exhibit B, Compensation, attached hereto and incorporated herein. It is agreed that the compensation for the additional Services shall not exceed $24,500.00 ("Cost Ceiling").

2.2. **Invoices.** CONSULTANT shall submit monthly invoices in a form satisfactory to CITY on or before the tenth day of each month for Services provided during the preceding month. CONSULTANT shall submit time and cost records as necessary to substantiate performance of the Services. Within 35 days after receipt of each such invoice, CITY shall verify the accuracy of the invoice, correct the charges where appropriate and as discussed and mutually agreed with CONSULTANT, and make payment to CONSULTANT in an amount equal to the amount of such invoice, as verified or
corrected by CITY. No payment hereunder shall be construed as evidence of acceptance of any of CONSULTANT's work. CITY reserves the right to withhold payment from CONSULTANT on account of Services not performed satisfactorily, delays in CONSULTANT's performance of Services, or other defaults hereunder. CONSULTANT shall not stop or delay performance of the Services under this Agreement on account of payment disputes with CITY.

2.3. Status Reports. Together with each monthly invoice, CONSULTANT shall submit a status report detailing the amount expended on the Services to that date and the remaining amount to be expended before the Cost Ceiling is reached. CONSULTANT shall notify CITY in writing when payments have reached 90 percent of the Cost Ceiling.

2.4. Withholding. In lieu of holding retention, CITY shall withhold CONSULTANT's final payment until the Services are complete and CITY has received all Documents. CONSULTANT shall diligently continue and complete performance of the Services if the Services are not complete at the time CONSULTANT has performed services up to the Cost Ceiling.

ARTICLE 3 - TIME OF PERFORMANCE

3.1. Effective Date. This Agreement shall become effective upon execution of the second signature and shall remain in full force and effect until the Services are completed (the "Term"). CONSULTANT agrees to complete all services by December 31, 2016.

3.2. Termination. This Agreement may be terminated at any time by CITY upon written notice to CONSULTANT.

3.3. Final Payment. CONSULTANT shall be entitled to compensation for Services performed up to the time of such termination, it being understood that any payments are full compensation for the Services rendered under this Agreement.

3.4. Other Remedies. Nothing in this Article 3 shall be deemed to limit the respective rights of the parties to terminate this Agreement for cause or otherwise to exercise any rights or pursue any remedies which may accrue to them.

ARTICLE 4 - DESIGNATED CONTACTS

4.1. CITY Contact. CITY designates Maria Aguilar, Assistant Superintendent, as its contact who shall be responsible for administering and interpreting the terms and conditions of this Agreement, for matters relating to CONSULTANT's performance under this Agreement, and for liaison and coordination between CITY and CONSULTANT. In the event CITY wishes to make a change in CITY's representative, CITY will notify CONSULTANT of the change in writing.

4.2. CONSULTANT Contact. CONSULTANT designates Doug Wolf or Alice Hale as its contact, who shall have immediate responsibility for the performance of the Services and for all matters relating to performance under this Agreement. Any change in CONSULTANT's designated contact shall be subject to written approval by CITY.
ARTICLE 5 - INDEMNIFICATION AND INSURANCE

5.1. **Indemnification.** CONSULTANT shall, to the fullest extent allowed by law, with respect to claims, liability, loss, damage, costs, or expenses, including reasonable attorney's and expert witness fees, awards, fines, penalties, or judgments, arising out of or relating to the Services (collectively "Claims"), defend, indemnify, and hold harmless CITY, its Officials, officers, employees and agents (the "CITY Parties"), except to the extent the Claims are attributable to CITY Parties' gross negligence or willful misconduct. CONSULTANT shall defend the CITY Parties as required by California Civil Code Section 2778, and with counsel reasonably acceptable to those parties. CONSULTANT shall have no right to seek reimbursement from the CITY Parties for the costs of defense. The obligations contained in this Section 5.1 shall survive the termination of this Agreement for whatever cause for the full period of time allowed by law and shall not in any way be limited by the insurance requirements of this Agreement. With respect to the professional liability of design professionals, as defined in Civil Code section 2782.8(c)(2), Consultant shall, to the fullest extent permitted by law, indemnify, protect, defend and hold harmless any City Parties from and against any and all Claims which arise out of, pertain to, or relate to the negligence, recklessness, or willful misconduct of the Consultant, or as may be provided in Civil Code section 2782.8.

5.2. **Health and Safety.** CONSULTANT may perform part of the Services at sites which contain unknown working conditions and contaminated materials. CONSULTANT shall be solely responsible for the health and safety of CONSULTANT's employees during the performance of the Services.

5.3. **Insurance.** CONSULTANT and all of CONSULTANTS employees, subcontractors, consultants and other agency shall procure, provide and maintain at all times during the performance of this Agreement, and for such additional periods as described herein, the insurance listed below with insurers licensed to do business in the State of California and with a Best's rating of no less than A:VII.

A. **Comprehensive Automobile Liability Insurance.** Comprehensive Automobile Liability Insurance providing bodily injury liability and property damage, to protect against all liability arising out of the use of any owned, leased, passenger or commercial automobile at a minimum amount of $1,000,000 combined single limit and $2,000,000 aggregate. Coverage shall apply to hired and non-owned autos.

B. **Commercial General Liability Insurance.** Commercial General Liability Insurance, with limits providing a minimum amount of $1,000,000 combined single limit coverage for each occurrence, $2,000,000 general aggregate and $2,000,000 products/completed operations aggregate. The insurance shall cover all operations including but not limited to the following: (1) premises, operations and mobile equipment liability; (2) completed operations and products liability; (3) contractual liability insuring the obligations assumed by CONSULTANT in this Agreement; (4) broad form property damage liability; (5) personal injury
liability endorsement, including death; and (6) automobile bodily injury and property damage insurance, including all owned, hired and non-owned equipment.

C. **Professional Liability Insurance.** Professional Liability Insurance protecting against liabilities arising out of or in connection with negligent acts, errors, or omissions of CONSULTANT and all of CONSULTANTS employees, subcontractors, consultants and other agency in connection with this Agreement, at a minimum amount of $1,000,000 combined single limit coverage and $1,000,000 aggregate, on a "claims made basis" with a continuation of coverage extension for liabilities for two years from the date the Services are substantially complete. Such professional liability policies shall include coverage for liability assumed by the CONSULTANT under this Agreement.

D. **Workers Compensation Insurance.** Workers Compensation insurance, occupational disease insurance and employer’s liability insurance shall be required with minimum limits as required by law, covering all workplaces involved in this Agreement.

E. **Policy Terms.** Concurrently with execution of this Agreement, CONSULTANT shall provide CITY with Certificates of Insurance evidencing that CONSULTANT has obtained or maintains the insurance required by this Section 5.3. The Certificates shall be on forms acceptable to CITY. CONSULTANT shall also furnish CITY with original endorsements with the following documentation:

- Precluding cancellation or reduction in coverage before the expiration of thirty (30) days after CITY shall have received written notification thereof from CONSULTANT by United States mail;
- Providing that CONSULTANT’s insurance shall apply separately to each insured against whom claim is made or suit is brought, and include a “separation of insureds” or “severability” clause which treats each insured separately, except with respect to the limits of the insurer’s liability (cross-liability endorsement);
- Naming CITY, its City Council, boards, commissions, committees, officers, employees and agents as additional insureds (“Additional Insureds”); and
- Providing that for any claims relating to CONSULTANT’s services hereunder, CONSULTANT’s insurance coverage shall be primary insurance with respect to CITY, its City Council, boards, commissions, committees, officers, employees and agents, and that any insurance or self-insurance maintained by CITY for itself, its City Council, boards, commissions, committees, officers, employees and agents shall be in excess of CONSULTANT’s insurance and shall not be contributory with it.
- It shall be a requirement under this Agreement that any available insurance proceeds broader than or in excess of the specified minimum insurance coverages requirements and/or limits shall be available to the Additional Insured, including but not limited to any umbrella or excess insurance. Furthermore, the requirements for coverage and limits shall be the greater of: (a) the minimum coverage and limits specified in this Agreement; or (b) the
broader coverage and maximum limits of coverage of any insurance policy or proceeds available to the named insured.

F. Material Breach. If CONSULTANT fails to maintain insurance coverage or provided insurance documentation which is required pursuant to this Agreement, it shall be deemed a material breach of this Agreement. CITY, at its sole option, may terminate this Agreement and obtain damages from CONSULTANT resulting from said breach. Alternatively, CITY may purchase the required insurance coverage, and without further notice to CONSULTANT, may deduct from sums due to CONSULTANT any premium costs advanced by CITY for such insurance. These remedies shall be in addition to any other remedies available to CITY.

ARTICLE 6 - NOTICES

All notices or other communications required or permitted hereunder shall be in writing, and shall be personally delivered or sent by facsimile or reputable overnight courier and shall be deemed received upon the earlier of: (1) if personally delivered, the date of delivery to the address of the person to receive such notice; (2) if delivered by Federal Express or other overnight courier for next business day delivery, the next business day; (3) if sent by facsimile, with the original sent on the same day by overnight courier, the date on which the facsimile is received, provided it is before 5:00 P.M. Pacific Time; or (4) if sent electronically, the date of delivery on the confirmed read receipt. Notice of change of address shall be given by written notice in the manner described in this Article 6. Rejection or other refusal to accept or the inability to deliver because of a change in address of which no notice was given shall be deemed to constitute receipt of the notice or communication sent. Unless changed in accordance herewith, the addresses for notices given pursuant to this Agreement shall be as follows:

If to CITY: Director of Public Works
170 Santa Maria Avenue
Pacifica, CA 94404
Phone: (650) 738-4660
Facsimile: (650) 355-7256
Email: ocampov@ci.pacifica.ca.us

If to CONSULTANT: Terraphase Engineering
Attn: Doug Wolf\Alice Hale
1404 Franklin Street, Ste 600
Oakland, CA 94612
Phone: (510) 645-1850
Facsimile: (510) 380-6304
ARTICLE 7 - MISCELLANEOUS

7.1. Entire Agreement. This Agreement represents the entire understanding of CITY and CONSULTANT as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with respect to those matters covered hereunder. This Agreement may only be modified by an amendment in writing signed by each party.

7.2. No Assignment. The Services are deemed unique and CONSULTANT shall not assign, transfer, subcontract or otherwise substitute its interest in this Agreement or any of its obligations hereunder without the prior written consent of CITY. As limited by this Section 7.2, this Agreement is to be binding on the successors and assigns of the parties hereto.

7.3. Severability. If any part of this Agreement is determined to be unconstitutional, invalid or beyond the authority of either party, such decision shall not affect the validity of the remainder of this Agreement, which shall continue in full force and effect, provided that the remainder of this Agreement can be interpreted to give effect to the intentions of the parties.

7.4. Counterparts. This Agreement may be signed in counterparts and, when fully signed, such counterparts shall have the same effect as if signed in one document.

7.5. Choice of Law. This Agreement and all matters relating to it shall be governed by the laws of the State of California without reference to its choice of laws principles and venue shall be in the appropriate court in San Mateo County, California.

7.6. Waiver. No failure on the part of either Party to exercise any right or remedy hereunder shall operate as a waiver of any other right or remedy that party may have hereunder. A waiver by either CITY or CONSULTANT of any breach of this Agreement shall not be binding upon the waiving party unless such waiver is in writing. In the event of a written waiver, such a waiver shall not affect the waiving party's rights with respect to any other further breach.

7.7. Mediation. In the event the parties are unable to resolve a dispute arising under this Agreement through good faith negotiations, the parties agree to submit the matter to mediation with a mutually agreeable mediator. Prior to the mediation, the parties shall exchange any documents reasonably necessary to resolve the matter to be mediated.

7.8. Attorney's Fees. If any action at law or in equity, including an action for declaratory relief, is brought to enforce or interpret the provisions of this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees, which may be set by the court in the same action or in a separate action brought for that purpose, in addition to any other relief to which that party may be entitled.

7.9. Interpretation. In the event this Agreement is ever construed in any dispute between the parties, it and each of its provisions shall be construed without regard to the party or parties responsible for its preparation and shall be deemed to have been prepared jointly
by the parties. The rule of construction to the effect that ambiguities are to be resolved against the drafting party shall not be employed in interpreting this Agreement.

7.10. Authority. Each individual executing this Agreement on behalf of one of the parties represents that he or she is duly authorized to sign and deliver the Agreement on behalf of such party and that this Agreement is binding on such party in accordance with its terms.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date set forth above.

CITY OF PACIFICA

By: ___________________________ Date________________
    Lorie Tinfow, City Manager

Attest

By: ___________________________ Date________________
    Kathy O’Connell, City Clerk

Approved As To Form

By: ___________________________ Date________________
    Michelle Marchetta Kenyon, City Attorney

CONSULTANT

TERRAPHASE ENGINEERING

By: ___________________________ Date 9/8/2016

By: ___________________________ Date________________
EXHIBIT A

SCOPE OF WORK
August 24, 2016

Ms. Maria Aguilar  
Assistant Superintendent  
City of Pacifica  
170 Santa Maria Avenue  
Pacific, California 94044 

sent via email to aquilarm@ci.pacificaco.us  


Dear Ms. Aguilar:

Terraphase Engineering Inc. (Terraphase) is submitting this change order request to the City of Pacifica ("the City") in order to proceed with preparation of technical studies to support the California Environmental Quality Act (CEQA) documentation for the proposed Wet Weather Equalization Basin at Site Alternative 2C in Pacifica, California ("the Site"). Based on the draft CEQA Initial Study documents prepared to date, the following studies are needed to support the CEQA Initial Study/Mitigated Negative Declaration, which were not included in our original proposal (dated October 28, 2016):

- Air Quality Study
- Noise and Vibration Study
- Biological Site Assessment
- Preliminary Wetland Assessment

The following scope of work provides a brief description of the services for each technical study.

**SCOPE OF WORK**

**Task 1  Air Quality Study**

Terraphase is teaming with Illingworth & Rodkin to prepare the Air Quality Study for the proposed project. The analysis will include:

- California Emissions Estimator Model (CaEEModel) modeling of construction emissions using refined construction assumptions (compared to those used in the initial evaluation) for community risk impacts. Illingworth & Rodkin will provide a worksheet to be completed by Freyer & Lauretta and 4Leaf detailing construction assumptions.
  
  - Includes greenhouse gas (GHG) construction emissions estimates.
  
  - Predict increased operational GHG emissions based on increased electricity consumption as it appears the increase in traffic will be negligible and there are no stationary sources.
• Dispersion modeling of construction emissions to predict community risk impacts. Preliminary evaluation indicate that the community risk impacts would likely be significant.

• Identify mitigation measures to reduce community risk impacts to less than significant level.

Following completions of the study, Illingworth & Rodkin will update the IS/MND Air Quality and GHG sections.

From receipt of the updated construction planning worksheet, Terraphase and Illingworth & Rodkin estimate that this task will require approximately two to three weeks to complete.

**Task 2  Noise and Vibration Study**

Terraphase is teaming with Illingworth & Rodkin to prepare the Noise Study for the proposed project. The analysis will include:

• Conduct ambient noise measurements.
• Model construction noise levels.
• Model and compute operational equipment (e.g., fans pumps) noise at sensitive receptor locations.

Following completions of the study, Illingworth & Rodkin will update the IS/MND Noise section.

From receipt of the updated construction planning worksheet, Terraphase and Illingworth & Rodkin estimate that this task will require approximately two to three weeks to complete.

**Task 3  Biological Site Assessment and Preliminary Wetland Assessment**

Terraphase is teaming with EMC Planning Group Inc. (EMC) to prepare the Biological Site Assessment and Preliminary Wetland Assessment to support the Biological Resources section of the IS/MND. The assessment will include the area identified in Figure 1 below, and will not include the pipeline alignments.

Based on discussions with the City, we understand that the proposed project may involve siting construction staging/access areas for the proposed EQ basin, which could extend outside the boundaries of the current Skate Park parking lot. Note that the site is located outside the Coastal Zone. The proposed staging/access areas may contain wetlands or habitat for special-status species, and these vegetated areas were not analyzed in the proposed IS/MND scope of work.

We understand that the City intends to fully avoid impacts to protected biological resources such as potentially jurisdictional wetlands and protected species. Therefore, the City is requesting a biological assessment and preliminary wetland assessment.

The following tasks are proposed:

• Project information review;
• Reconnaissance-level biological field survey;
• Preliminary wetland assessment and report of findings including wetland map; and
• Initial Study Biological Resources section revision.
From receipt of the updated construction planning worksheet, these tasks will require approximately two to three weeks to complete. The biological consulting services scope of work includes the following steps:

1. Compile and review all available project information, including preliminary site plans and aerial photographs. Conduct a review to determine the special-status species that have been recorded as occurring within the general project vicinity based on current database searches of the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDDB), the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory, and the U.S. Fish and Wildlife Service (USFWS) Endangered Species Program, Critical Habitat Mapper, and National Wetlands Inventory.

2. Complete a reconnaissance-level field survey of the project site in order to (1) identify the principal plant communities; (2) assess the potential for special-status species and their habitats, wildlife movement corridors, potentially jurisdictional wetlands and waterways, and other significant biological resources to occur; and (3) identify any observed locations of special-status species and/or habitats. Plant and wildlife species observed during the surveys will be recorded in field notes. Any special-status species observed will be reported to the CNDDDB in compliance with CDFW requirements. This field assessment is not intended to meet specific protocol-level survey requirements established by regulatory agencies for any particular special-status species.

3. Conduct a preliminary wetland assessment and prepare a letter report of findings that includes a map of wetlands if appropriate. The field component of the wetland assessment will be completed as part of the reconnaissance-level biological field survey. This wetland assessment will not constitute a formal jurisdictional delineation of wetlands/waterways. No regulatory agency permitting/coordination, formal wetland determination report preparation, or soil pit analysis is included in the scope of work because the project proponent intends to fully avoid impacts to any potentially jurisdictional wetlands identified during the preliminary assessment.

4. Revise the existing Biological Resources section of the Initial Study to present the proposed project impacts and determine their level of significance. This will include appropriate mitigation measures to avoid, minimize, and/or mitigate potentially significant impacts to biological resources.

Findings from these studies will be incorporated into the Hydrology and Water Quality and Land Use and Planning sections as appropriate. Terraphase assumes up to 5 hours of Associate time will be required to incorporate these findings.
EXHIBIT B

Compensation

CITY shall pay CONSULTANT for the Services on a cost reimbursement basis, up to the Cost Ceiling (as defined in Section 2.1 of the Agreement). CONSULTANT agrees to use appropriate methods to contain its fees and costs under this Agreement. Compensation shall include only the following costs, which shall all count toward the Cost Ceiling:

1. Direct Labor

Direct labor costs shall be the total number of hours worked on the job by each employee times the agreed hourly rate for such employee’s labor as set forth on the attached Exhibit B-1. CITY will pay all personnel at their regular straight-time rate, including any work performed on overtime or on holidays or weekends.

2. Subconsultant Costs

Subconsultant services shall be billed at cost plus a not to exceed 10 percent markup. CONSULTANT shall provide a copy of each subconsultant’s invoice for which it seeks payment from CITY with any invoice in which such payment is requested.

3. Other Direct Costs

The following categories of costs are eligible for reimbursement, which shall be made at the actual cost to CONSULTANT without any additional mark-up:

a. Reasonable living and traveling expenses of employees when away from home office on business in its prosecution of the Services. CONSULTANT must have prior approval of CITY to be reimbursed for these expenses.

b. Automobile expenses for personal vehicle use, if necessary, at the IRS approved mileage rate.

c. Reproduction of drawings and specifications by CONSULTANT as required under this Agreement, at rates prevailing in this community for bulk reproduction or at other reasonable rates approved by CITY.

d. Special overnight delivery or messenger services.

Payments to CONSULTANT for reimbursable costs/expenses will be made only after the specific costs/expenses have been incurred and CONSULTANT has submitted substantiating documentation, such as copies of paid invoices or other documentation confirming that such costs/expenses have been incurred.
COST ESTIMATE

Our total estimated cost to complete the environmental review of the project is $24,500, including:

- Task 1 – Air Quality Study: $5,200
- Task 2 – Noise Study: $6,800
- Task 3 – Biological Site Assessment and Preliminary Wetland Assessment: $12,500

The fee represents the labor and reimbursable expenses for all tasks included in the scope of work and assumptions described above. Any services beyond those specified in this proposal will be performed on a time-and-materials basis and will require additional authorization by the client.

CLOSING

We are grateful for the opportunity to offer our services on this important project. If you have any questions or comments regarding this submittal, please contact Mr. Wolf at (925) 788-4331 or Ms. Hale at (510) 390-1276.

Sincerely,

For Terraphase Engineering Inc.

Alice Hale
Associate Engineer

Doug Wolf
Principal Engineer
EXHIBIT B-1

(Consultant Fee Schedule)
# 2015 Standard Schedule of Charges

**With 15% Discount / 10% ODC**

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<th>Standard Hourly Rate</th>
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<tr>
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<td>Administrator</td>
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**Labor Charges**

All time will be recorded and charged to nearest 0.1 hour. Expert testimony at trials, hearings and depositions will be billed at 150% of the standard hourly rate. For each day when testimony is provided, a minimum of 8 hours will be billed. Preparatory time will be billed at standard rates.

**Expenses**

Subcontractor fees and other direct costs, such as air travel, project supplies and rental equipment, etc. will be itemized and billed at our cost plus a ten percent handling charge (standard handling charge is fifteen percent). Vehicle mileage when itemized is billed at the standard government rate in effect at the time of travel (www.gsa.gov/mileage).

**Payment**

Payment is to be mailed to Terraphase Engineering Inc., 1404 Franklin Street, Suite 600, Oakland CA 94612 and is due within 30 days of receipt of invoice. A service charge of 1.5% per month or the allowable legal rate may be charged on amounts that are past due for more than 30 days.
SUBJECT:
Memorandum of Understanding with Pacifica Battalion Chiefs Teamsters, Local 856

STAFF CONTACT:
Lorenzo Hines Jr., Assistant City Manager
lhines@ci.pacifica.ca.us
650-738-7301

RECOMMENDED ACTION:
Adopt a resolution approving the Memorandum of Understanding as presented

BACKGROUND/DISCUSSION:
The Pacifica Battalion Chiefs Teamsters Local 856, and representatives of the City of Pacifica have met and conferred in good faith regarding wages, and other terms and conditions of employment of unit members.

The major provisions of the Memorandum of Understanding become effective on August 20, 2016, and the MOU term ends on June 30, 2018.

The agreement contains specified increases in salary and wages during the life of the contract. In exchange for these increases the contract relieves or reduces City costs associated with member retirement contributions, eliminates administrative leave, and revises vacation accruals. The contract also modifies the City’s current healthcare provision policies, adds language incorporating Public Employee Pension Reform Act 2012, updates and clarifies various provisions, and sets forth when negotiations for the subsequent contract will begin.

FISCAL IMPACT:
Costs associated with this agreement are estimated to be approximately $25,000 in increased salaries and benefits over the life of the multi-year agreement.

COUNCIL ACTION REQUESTED:
Adopt a resolution approving the Memorandum of Understanding as presented.

ORIGINATED BY:
City Manager’s Office
ATTACHMENT LIST:

MOU - FIRE BATTALION CHIEFS - FINAL (DOCX)
RESOLUTION NO. (ID # 2022)

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PACIFICA APPROVING THE MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF PACIFICA AND PACIFICA BATTALION CHIEFS TEAMSTERS LOCAL 856 FOR THE PERIOD OF AUGUST 20, 2016 THROUGH JUNE 30, 2018

WHEREAS, a Memorandum of Understanding has been negotiated and agreed to by the Pacifica Battalion Chiefs Teamsters Local 856 and;

WHEREAS, said Memorandum of Understanding has been approved by the City Council at its meeting held on September 12, 2016 and authorization given for the City Manager to execute said agreement;

NOW, THEREFORE, be it resolved by the City Council of the City of Pacifica that it hereby authorizes execution of the Memorandum of Understanding with members of the Pacifica Battalion Chiefs Teamsters Local 856, in substantially similar form, as approved by the City Attorney attached hereto, for the period of August 20, 2016 through June 30, 2018.

PASSED AND ADOPTED at a regular meeting of the City Council of the City of Pacifica, California, held on September 12, 2016 by the following vote:

AYES, Councilmembers:

NOES, Councilmembers:

ABSENT, Councilmembers:

ABSTAIN, Councilmembers:

_______________________
Sue Digre, Mayor

ATTEST:

_______________________
Kathy O’Connell, City Clerk

APPROVED AS TO FORM:

_______________________
Michelle Kenyon, City Attorney
MEMORANDUM OF UNDERSTANDING

BETWEEN

THE CITY OF PACIFICA

AND

PACIFICA BATTALION CHIEFS TEAMSTERS LOCAL 856

JULY 1, 2010 THROUGH JUNE 30, 2012

Date of City Council Approval Through June 30, 2018
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MEMORANDUM OF UNDERSTANDING
between
CITY OF PACIFICA
and
TEAMSTERS LOCAL 856 FOR FIRE DEPARTMENT BATTALION CHIEFS

The Teamsters Local 856 and representatives of the City of Pacifica have met and conferred in good faith regarding wages, hours and other terms and conditions of employment of employees unit members in the representation unit specified in Section 1, have exchanged freely information, opinions and proposals and have endeavored to reach agreement on all matters relating to the employment conditions and employer-employee relations of such employees unit members.

This Memorandum of Understanding is entered into pursuant to the Meyers-Milias-Brown Act (Government Code Sections 3500, et seq.) and has been jointly prepared by the parties.

This Memorandum of Understanding (MOU) shall be presented to the City Council as the joint recommendations of the undersigned for salary and employee benefit adjustments for the period commencing the date the City Council approves this MOU July 1, 2010 through June 30, 2012.

As used throughout this Memorandum of Understanding, the pronoun designation he or his is intended to be applicable to both the male and female gender.

SECTION 1. RECOGNITION

1.1 Union Recognition

The City of Pacifica recognizes the Teamsters International, Local 856, AFL hereafter referred to as the (“Union”), is as the recognized employee organization representing the majority of unit members included below. The Unit consists of all employees in classifications as may be added to the Unit by the City during the term of this Memorandum.

Classifications currently included in the Unit include:

- 40-Hour Battalion Chief;

- The bargaining unit does not include 56-Hour Battalion Chief unit members. In the event that 56-Hour Battalion Chief classifications are created, the City shall add such positions to this bargaining unit. The City and the Union agree to meet and confer about appropriate terms and conditions for 56-Hour unit members.
1.2 City Recognition

The City Manager or designee of the City of Pacifica, or any person or organization duly authorized by the City Manager or designee, is the representative of the City of Pacifica, hereinafter referred to as the "City" in employer-employee relations as provided in Resolution No. 29-84 adopted by the City Council on April 23, 1984.

SECTION 2. ORGANIZATION SECURITY

2.1 Dues Deduction

Payroll deductions for membership dues shall be granted by the City Manager or where the authority has been delegated by the City Manager, the City Manager’s representative, only to the Union.

The following procedures shall be observed in the withholding of employee unit member earnings:

(1) Payroll deductions shall be for a specified amount and uniform as between employee unit member members of the Union and shall not include fines, fees, and/or assessments. Dues deduction shall be made only upon the employee’s unit member’s written authorization.

(2) Authorization, cancellation or modification of payroll deduction shall be made upon forms provided or approved by the City Manager or designee. The voluntary payroll deduction authorization shall remain in effect until employment with the City is terminated or until canceled or modified by the employee unit member by written notice to the City Manager or designee. Employees Unit members may authorize dues deductions only for the organization certified as the recognized employee unit member organization of the unit to which such employees unit members are assigned.

(3) Amounts deducted and withheld by the City shall be transmitted to the officer designated in writing by the Union as the person authorized to receive such funds, at the address specified.

(4) The employee’s unit member’s earnings must be sufficient, after all other required deductions are made, to cover the amount of the deductions herein authorized. When an employee unit member is in a non-pay status for an entire pay period, no withholdings will be made to cover that pay period from future earnings nor will the employee unit member deposit the amount with the City which would have been withheld if the employee unit member had been in pay status during that period. In the case of an employee unit member who is in a non-pay status during a part of the pay period, and the salary is not sufficient to cover the full withholding, no deduction shall be made. In this connection, all other required deductions have priority over the employee unit member organization deduction.
All employees—unit members who are members of Local 856, and who are tendering periodic dues through dues deductions from their bi-weekly paychecks and all employees—unit members who become members of Local 856, and who tender periodic dues through dues deductions of their bi-weekly paychecks shall continue to pay dues to Local 856, for the duration of this Memorandum of Understanding and each subsequent Memorandum of Understanding thereafter. For the period of ninety to sixty (90-60) days prior to the expiration of this Memorandum of Understanding and ninety to sixty (90-60) days prior to the expiration of any subsequent Memorandum of Understanding, any employee who is a member of Local 856, shall have the right to withdraw from the Union by discontinuing dues deduction. Said withdrawal shall be communicated by the employee during that period of time in writing to the Financial Services Manager, Administrative Services Director, to be delivered by certified mail and must be postmarked during the ninety to sixty (90-60) day period.

The Union shall indemnify, defend and hold the City harmless against any claim made and against any suit initiated against the City on account of check off of Union dues or premiums for benefits. In addition, the Union shall refund to the City any amounts paid to it in error upon presentation of supporting evidence.

2.2 Use of City Facilities

City employees or the Union, or its representatives may, with the prior approval of the Administrative Services Director, be granted the use of City facilities for meetings of City employees provided space is available, and provided further such meetings are not used for organizing activities or membership drives of City employees.

2.3 Use of Bulletin Boards

The Union shall be allowed use of available bulletin board space in the fire stations for communications having to do with official Union business; provided that material posted is not derogatory to City officials and employees or other employee organizations in the judgment of the Fire Chief. All materials must be dated and must identify the organization that published them.

2.4 Advance Notice of Rules and Regulations

Except in cases of emergency when the City Manager determines that an ordinance, rule, resolution or regulation must be adopted immediately without prior notice or meeting with the Union, the City Manager or the Administrative Services Director shall provide such notice and opportunity to meet at the earliest practicable time following adoption of such rule, resolution or regulation. Notice shall be sent to the designated Union representative.
SECTION 3. NO DISCRIMINATION

There shall be no discrimination because of race, creed, color, national origin, sex or legitimate employee organization activities against any employee or applicant for employment by the Union or by the City or by anyone employed by the City; and to the extent prohibited by applicable state and federal law there shall be no discrimination because of age. There shall be no discrimination against any disabled person solely because of such disability unless that disability prevents the person from meeting the minimum standards established.

The City of Pacifica prohibits harassment and discrimination in the workplace on the basis of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status, or legitimate employee organization activities.

It is the policy of the City that all unit members have the right to work in an environment free from any such harassment and discrimination. Such prohibited activity debilitates the morale and productivity of the victims and their co-workers. The City does not condone any form of such harassment or discrimination and those who engage in such activities shall be subject to disciplinary action up to and including termination.

SECTION 4. UNION REPRESENTATIVES

4.1 Attendance at Meetings by Employees/Unit Members

Employees who are official representatives or unit representatives of the Union may be required to submit a written request for excused absence to their respective department heads, with an information copy to the Administrative Services Director, prior to a scheduled meeting with management representatives, or to be present at hearings where matters within the scope of representation are being considered. Such written request shall be submitted at least two (2) working days prior to such scheduled meetings, whenever possible. City employees/Unit members who are official representatives or unit representatives of the Union shall be given reasonable time off with pay to attend meetings with management representatives, or to be present at hearings where matters within the scope of representation are being considered. The use of official time for this purpose shall be reasonable and shall not interfere with the performance of city services as determined by the City Manager or designee. Such unit member representatives may be required to submit a written request for excused absence to their respective department director, with an information copy to the Assistant City Manager or designee/Human Resources Department, at least two (2) working days prior to the scheduled meeting whenever possible. Except by mutual agreement, the number of employees/unit members excused for such purposes shall not exceed two (2).
4.2 Access to Work Locations

Reasonable access to employee work locations shall be granted officers of the Union and their officially designated representatives, for the purpose of processing grievances or contacting members of the Union concerning business within the scope of representation.

Access shall be restricted so as not to interfere with the normal operations of the department or with established safety or security requirements.

Solicitation of membership and activities concerned with the internal management of the Union, such as collecting dues, campaigning for office, conducting elections and distributing literature, shall not be conducted during working hours unless approved in advance by the City Manager or his designee.

4.3 Use of City Facilities

Unit members or the Union, or its representatives, may with the prior approval of the City Manager or designee, be granted the use of City facilities for meetings of unit members provided space is available, and provided further such meetings are not used for organizing activities or membership drives of City employees. All such requests shall be in writing and shall state the purpose or purposes of the meeting. The City reserves the right to assess reasonable charges for the use of such facilities.

4.4 Use of Bulletin Boards

The Union shall be allowed use of available bulletin board space in fire stations for communications having to do with official Union business, provided that the material posted is not derogatory to City officials, employees or other employee organizations in the judgment of the Fire Chief. All materials must be dated and must identify the organization that published them.

4.5 Advance Notice of Rules and Regulations

Except in cases of emergency, reasonable advance written notice shall be given to the Union if it is affected by any ordinance, rule, resolution, or regulation directly relating to matters within the scope of representation proposed to be adopted by the City Council, by any board or commission of the City, or by any department, as the Union shall be given the opportunity to meet with such body or its representatives prior to adoption. In cases of emergency when the City Manager or designee determines that an ordinance, rule, resolution, or regulation must be adopted immediately without prior notice or meeting with the Union, the City Manager or designee shall provide such notice and opportunity to meet at the earliest practicable time following the adoption of such ordinance, rule, resolution or regulation. Notices shall be sent to the designated Union representative.
SECTION 5. PAY PLAN

5.1 — Salaries

There will be no salary increases during the term of this contract.

5.2 — Rates of Pay

5.1 Base Salaries – Battalion Chiefs Bargaining Unit Classifications

The monthly base salaries described in Sections 5.1, 5.2, and 5.3, and set forth in Appendix A-1, A-2, and A-3 include the Holiday-In-Lieu pay required by Section 10.2 of this MOU.

5.2 2015-2016 Salary Schedule

The 2010-2012 salary ranges and salary schedule for Battalion Chiefs bargaining unit classifications in effect in 2015-2016 and prior to the effective date of this MOU are stated in Appendix A-1 attached to and incorporated into this MOU.

5.3 Salary Schedule Increase Contingency Agreement

The 2016-2017 and 2017-2018 salary schedule increases provided in Sections 5.3.1 and 5.3.2 for Battalion Chiefs bargaining unit members are subject to and contingent upon the Battalion Chiefs bargaining unit’s agreement to the pension cost sharing arrangement described in Section 20 (including subsections), and the Battalion Chiefs bargaining unit’s fulfillment of all obligations stated in those sections.

5.3.1 5.2.1 2016-2017 Salary Schedule

Effective August 20, 2016, the City shall improve the base salary schedule for all Battalion Chiefs bargaining unit classifications by nine percent (9.0%) over the 2010-2016 salary schedule set forth in Appendix A-1 for Battalion Chiefs bargaining unit members in active, paid status on the effective date. The 2016-2017 salary schedule for Battalion Chiefs bargaining unit members shall be titled “2016-2017 Battalion Chiefs Salary Schedule” and shall be attached to this Agreement as Appendix A-2.

5.3.2 5.2.2 2017-2018 Salary Schedule

Effective at the beginning of the first pay period in July 2017, the City shall improve the base salary schedule for all Battalion Chiefs bargaining unit classifications in Appendix A by two percent (2.0%) over the 2016-2017 salary schedule in Appendix A-2 for Battalion Chiefs bargaining unit members in active, paid status on the effective date. The 2017-2018 salary schedule for Battalion Chiefs bargaining unit members shall be titled “2017-2018 Battalion Chiefs Salary Schedule” and shall be attached to this Agreement as Appendix A-3.
5.4 **Salary Schedule Regulations**

The rates of pay set forth in this Section, Appendices A-1, A-2, and A-3: (1) represent the standard or base rate of pay for full-time employment for each classification. Battalion Chiefs unit members. Compensation for employees--Battalion Chiefs unit members working less than full-time shall be adjusted proportionately.

The rates of pay set forth in this Section; (2) represent the total compensation due employees--Battalion Chiefs unit members, except for overtime compensation and other benefits specifically provided for by the City Council or this Memorandum of Understanding; and (3) do not include reimbursement for actual and necessary expenses for traveling, subsistence, and general expenses authorized and incurred incident to City employment. The hourly rate of pay shall be calculated by multiplying the appropriate monthly rate by twelve (12) and dividing the total by 2080 for forty-hour (40) workweek employees. Unit members or dividing the total by 2912 for fifty-six (56) hour workweek employees.

EMT Certificate. Employees who possess and maintain an EMT Certificate, including EMT-D when the Pacifica Fire Department has such a program, shall receive the EMT incentive pay of 4.5% (four and one-half percent) of the top step Fire Fighter base pay.

5.3 **Salary for New Employees**

5.5 **Salary for New Battalion Chief Employees**

Except as herein otherwise provided, the entrance salary for a new employee entering the classified service shall be the minimum salary for the class to which such new employee is appointed. In cases of unusual recruitment difficulty or of hiring exceptionally qualified personnel, initial salary may be at any step set by the City Manager or designee, whose decision shall be final. Such a salary may not be more than the maximum salary for the class to which the employees--Battalion Chiefs unit members is appointed.

5.6 **Conversion of Rates**

Any Battalion Chief unit members, any monthly, per Diem, or hourly rate of pay may be converted into any equivalent rate of pay or to any other time basis when, in the judgment of the City Manager or designee, such a conversion is advisable. Such conversion shall not contravene the provisions of this Memorandum of Understanding.

5.7 **Pay Days**

Employees--Battalion Chief unit members shall be paid bi-weekly, normally on a Friday every other week. Paychecks will be available Thursday evening at Headquarters. When a holiday is celebrated on a Friday payday, employees--unit members normally will be paid on the regular workday immediately preceding that Friday.
5.8 **Salary Step Increases**

No increase in salary shall be automatic merely upon completion of a specified period of service. All increases shall be based on merit as established by the record of the employee’s performance and shall require recommendation of the Fire Chief or department director and approval by of the City Manager or designee. Standards of performance shall become progressively higher as the employee advances through the salary range. In the case of inferior work, lack of application, or indifferent attitude, increase in salary may be withheld, or the salary of the employee may be reduced to a lower step within the established salary range for this classification upon recommendation of the Fire Chief and approval of the City Manager or designee. Any regular employee nonprobationary unit member shall be given a written statement of the justification for reduction in salary and shall be entitled to appeal as provided in Section 18 (Grievances). Grievances.

5.9 **Assignment of Salary by City Manager or designee**

If the City Manager or designee at any time determines that it is in the City’s interest, she or he may assign an employee to a higher rate within the salary range fixed for the classification. The City Manager or designee shall regulate the accelerated advancement through the salary range.

5.10 **Exceptional Contribution Adjustment**

When a Battalion Chiefs unit member makes a unique contribution to the City that is not expected in the normal discharge of the responsibilities of the position, and when such contribution is obvious by its significance, substantial, and unique nature, the individual may be awarded an exceptional contribution adjustment. Such an award will be limited to a maximum of five percent (5%) and be granted in a lump sum or for a specific limited period of time not to exceed twelve (12) months. The actual percentage amount up to the five percent (5%) limit and the time interval it is to be awarded for will be determined by the City Manager or designee and will be based upon the quality and significance of the contribution that is being recognized. There shall be no more than one (1) exceptional contribution adjustments for the Battalion Chief bargaining unit in any one (1) year.

5.11 **Salary upon Transfer or Promotion**

For Battalion Chief unit members, the transfer of a unit member shall not be cause for a change in salary.

Consistent with City policy, all employees of the unit members shall be entitled to an increase in salary of at least one step but not less than five percent (5%) above their current salary; provided, however, that in no event shall the unit member receive more than the maximum salary for the classification.
5.12 **Educational Incentive Programs**

The Fire Battalion Chief Education Incentive Program is as follows:

5.12.1 **Certificate or Degree**

In addition to the unit member’s base rate of pay, the City shall pay a unit member who holds a “Chief Officer’s Certificate” or a Bachelor of Arts or Bachelor of Science degree from a state or regionally accredited university, three and one-half percent (3.5%) of the unit member’s base rate of pay.

5.12.2 **Successful Completion of Course Work**

In addition to the unit member’s base rate of pay, the City shall pay a unit member, who successfully completes the course work required by this section, five percent (5.0%) of a unit member’s base rate of pay. To be eligible for this incentive pay, the unit member must successfully complete each calendar year, forty (40) hours of course work, approved by the Fire Chief or Fire Chief’s designee including, but not limited to, (1) Fire Inspection Practices – Command/Tactics-Instructor, (2) Training- Code Enforcement/UBC-UFC-Management/Supervision-Hazardous Materials Management/Supervision-Hazardous Materials Management.

Eligible course work completed between January 1 and December 31 of each respective calendar year shall qualify a unit member for educational incentive pay for the following calendar year respectively.

5.12.3 **Tuition Reimbursement**

Unit members are eligible to participate in the City’s tuition reimbursement program per City policy and procedure. A unit member shall be reimbursed up to a maximum to Six Hundred Dollars ($600) per fiscal year for tuition and related fees paid for courses of study in an off-duty status if the subject matter content of the course is closely related to the unit member’s present work assignment, or if the unit member is enrolled in a program of study related to the unit member’s work assignment (declared major). There must be a reasonable expectation that the unit member’s work performance or value to the City will be enhanced as a result of the course of study.

The unit member must submit a claim form for reimbursement to the Fire Chief, giving all the information needed for an evaluation of the request. The Fire Chief shall recommend approval or disapproval and forward the request to the Assistant City Manager or designee, whose decision shall be final. If a course is approved and later found to be unavailable, a substitute course may be approved after enrollment.

Upon completion of the course, the unit member must provide the City with a copy of the grade sheet or certificate which must be filed in the Personnel
Office for placement in the unit member’s personnel file. All reimbursements must be returned to the City in full if the unit member does not achieve at least a “C” grade. Upon leaving City employment, a unit member is not required to refund any such reimbursement to the City.

5.13 **5.12** EMT Certificate Pay

Unit members who possess and maintain an EMT Certificate, including EMT D when the Pacifica Fire Department has such a program, shall receive the EMT incentive pay of 4.5% (four and one-half percent) of the top step Battalion Chief base pay.

5.14 **5.13** Strike Team Leader Engine (STEN) Premium Pay

Effective the first pay period following City Council approval of this MOU, the City shall pay $55.38 per pay period to a unit member who has completed and maintained currency in the California Incident Command Certification System (“CICCS”) Qualification Guide defined training, experience, fitness level, and is qualified to be assigned as a strike team leader engine (STEN).

5.15 **5.14** Forty Hour Per Week (4 days X 10 hours) Work Schedule Incentive Pay

For a Battalion Chief unit member who is assigned to a 40 hour per week (4 days X 10 hours per day) work schedule that requires work on weekends and/or the holidays listed in Section 10.1, the City shall pay, in addition to the unit member’s base pay, an incentive pay equal to two and one-half (2.5%) of the individual unit member’s base pay.

5.16 **5.16** 401(a)(h) Plan – City Contribution

Each pay period, the City shall contribute the following amounts to a 401(a) and 401 (h) plan for each unit member:

- 401 (a) __________ 2.25%
- 401 (h) __________ 0.75%

5.8 **Administrative Leave**

Effective July 1, 2011, Employees in this unit will receive administrative leave at the rate of forty (40) hours per fiscal year for use only during the fiscal year in which it is credited. Administrative leave has no cash value and does not accumulate from year to year.

**SECTION 6. ANNIVERSARY DATE**

For all purposes except eligibility for salary increases an employee’s, a unit member’s anniversary date shall be the date of initial hire. For the purposes of salary administration in cases of promotion, demotion or reinstatement, the anniversary date shall be the effective date of the promotion, demotion or reinstatement.
SECTION 7. DAYS AND HOURS OF WORK

Forty Hour Per Week (4 days X 10 hours per day) Work Schedule

The regular work schedule for all Battalion Chiefs shall be the 56 hour work schedule. The City Manager, Administrative Services Director and the Fire Chief will meet and confer with the Union regarding any changes in the 56 hour work schedule for Battalion Chief with the exception of a 56 hour schedule for BC Engler and a 40 hour work week for all Battalion Chiefs.

The City may assign a unit member to work a forty hour week with a 4 days per week and 10 hours per day schedule.

The work schedule shall follow applicable FSLA regulations as established:

\[ X = \text{24 hour on-duty period} \]
\[ 0 = \text{24 hour off-duty period} \]

The classification of Battalion Chiefs is subject to the FLSA work cycle; therefore Battalion Chiefs are compensated for overtime in accordance with the FLSA guidelines.

In the event one shift is scheduled to work both December 24th and December 25th of the same year, the shift assigned to work on December 23rd will be reassigned to work on December 24th. The shift originally scheduled to work December 24th will be reassigned to work December 23rd. This shall also apply to scheduling on New Year’s Eve, December 31st and New Year’s Day, January 1st.

7.2 Fair Labor Standards Act

The above work schedule consists of a 24-day (twenty-four) FLSA cycle. Employees shall receive ten (10) hours of pay at a rate equal to one-half (1/2) the regular rate of pay based on the 56 (fifty-six) hour rate per FLSA cycle.

7.3 Change of Shift

If the shift assignment of an employee who is assigned to a shift is changed while the currently used work schedule is in effect, authorized work time shall not constitute overtime if the following schedule is maintained:

(A) Change from "A" Shift to "B" Shift: Employee works first (1st) day on "A" shift, and then works second (2nd) day on "B" shift.

(B) Change from "A" Shift to "C" Shift: Employee works first (1st) day on "A" shift, and then works second (2nd) day on "C" shift.
(C) Change from "B" Shift to "A" Shift: Employee works first (1st) day on "B" shift, then works second (2nd) day on "A" shift.

(D) Change from "B" Shift to "C" Shift: Employee works first (1st) day on "B" shift, and then works both days on "C" shift.

(E) Change from "C" Shift to "A" Shift: Employee works both days on "C" shift, then works second (2nd) day on "A" shift.

(F) Change from "C" Shift to "B" Shift: Employee works first (1st) day on "C" shift, then works second (2nd) day on "B" shift.

Shift exchanges between personnel and standby exchanges shall not be considered overtime.

7.1 Starting Time

The regular starting time for employees unit members shall be 8 A.M.

7.5 Exchange of On-Duty Time

Exchanges of on-duty time shall not be granted in cases that would result in financial responsibility for the City, and such exchanges must be within the extent permitted by applicable State or Federal law.

When an employee exchanges on-duty time, the hours worked shall be excluded from the calculation of the hours for which the substituting employee would otherwise be entitled to overtime compensation. Where one employee substitutes for another, each employee will be credited as though he had worked his normal work schedule for that shift.

Exchanges of on-duty time of less than twenty-four (24) hours normally will not be permitted for the employee to participate in an outside activity on a regular, ongoing basis except for educational or training purposes.

If any employee agrees to work for employees initiating exchanges to an excessive degree, the Fire Chief may advise that employee that future requests involving the employee in the exchange will be denied.

Requests for exchanges of on-duty time or cancellation of approved exchanges shall be submitted for approval to the Captain in charge at least one (1) day prior to the exchange or cancellation for trades occurring between 9 A.M. and 12 Noon and 1 P.M. and 4 P.M. Requests for exchanges of on-duty time or cancellation of approved exchanges for Captains shall be submitted for approval to the Fire Chief or his designated representative at least one (1) day prior to the exchange or cancellation for trades occurring between 9 A.M. and 12 Noon and 1 P.M. and 4 P.M. This provision shall not apply in cases involving emergency exchanges of on-duty time or emergency cancellations of approved exchanges. These requests shall be on the proper form and shall include the signature of both employees involved in the exchange. When it is not feasible for the form to be signed prior to the trade, it must be completed immediately after the trade.
No exchanges will be permitted that would require any employee to work more than seventy-two (72) hours in succession without a minimum of eight (8) hours off before rescheduling himself to duty, or that will change an employee's duty cycle or allow the employee to miss necessary training.

SECTION 8. OVERTIME

8.1 Authorization

All overtime work must be approved in advance by the Fire Chief or his designated representative; provided, however, that for emergency conditions the Fire Chief may approve exceptions to this procedure.

8.2 Definition

Any authorized time worked in excess of the employee's unit member's regular workweek shall be considered overtime and shall be compensable at the rate of one and one-half (1-1/2) times the employee's unit member's regular straight-time rate of pay. The term time worked shall be in accordance with the definition contained in the Fair Labor Standards Act. All overtime shall be calculated to the nearest quarter (1/4) hour in favor of the employee unit member. Such overtime compensation pay be either in the form of a direct cash payment or in the form of compensatory time off to the extent permitted by applicable State or Federal law, at the discretion of the Fire Chief with due consideration of any preference expressed by the employee unit member. Compensatory time off which accrues in excess of one hundred twelve (112) hours must be liquidated by monetary payment. Employees Unit members who terminate employment shall be paid for all compensatory time off accrued.

8.3 Call Back

If an employee who has completed a normal shift for the day is called back to work (from home), such employee shall, upon reporting, receive a minimum of one (1) hour overtime compensation. The rate of compensation shall be the 56-hour overtime rate for all shift staffing requirements, with the exception of emergency call back as defined below, which will be paid at the 40-hour overtime rate:

Emergency callback shall be defined as a call to return to duty as a result of an emergency incident that has depleted the on-duty resources of the City. The emergency incident would be of the magnitude to require the recalled personnel to respond to the incident or staff fire apparatus to provide protection to the remainder of the city. All other callbacks would constitute "minimum staffing."

The 56-hour overtime rate also applies to all assignments associated with O.E.S. or out-of-county strike teams.
The shift staffing 56 hour rate shall be computed by multiplying the regular rate of pay by one and one half (1½). The emergency and other non-shift special assignment 40 hour rate shall be compensated at an hourly rate determined by dividing the monthly salary by one hundred seventy-three and three tenths (173.3) and multiplying the result by one and one half (1½).

When the Fire Chief or Fire Chief’s designee calls a unit member back to work after the unit member has completed a normal shift for the day, the City shall pay the unit member a minimum of two (2) hours of overtime pay.

SECTION 9. LAYOFF/REINSTATEMENT FOLLOWING VOLUNTARY RESIGNATION

9.1 Layoff/Reduction of Force Within a Specific Classification

At least ten (10) working days prior to the effective day of the layoff, the City Manager or designee, or where the authority has been delegated by the City Manager or designee, the City Manager’s or designee’s representative shall notify the employees-unit members affected in writing. Layoff shall be made within the classes of positions and all temporary employees-unit members in affected classifications shall be laid off prior to layoff of any probationary or permanent employees-unit members. For the purpose of determining order of layoff, total cumulative time shall include time served in military leave of absence.

Employees-Unit Members laid off shall have the right to displace the employee-unit members in the same classification having the least seniority. Names of persons laid off shall be placed upon re-employment lists in order of total cumulative time served and shall remain on such list for a period of two (2) years unless reemployed sooner. Sick leave and seniority rights earned prior to layoff will be returned to the employee-unit member upon re-employment. Upon request of the employee-unit member, with the permission of the City Manager or designee, demotion may be made to a vacant position in place of layoff. The City Manager’s or designee’s decision shall be final.

9.2 Reinstatement Following Voluntary Resignation

A permanent employee-unit member who voluntarily resigns in good standing may, within twelve (12) months of the effective date of such resignation, request to be reinstated to his/her former position. If a vacancy exists, the City shall consider such request. If the request is approved, and the employee-unit member has been separated from service for thirty (30) days or less, his/her seniority earned prior to the employee’s unit member’s resignation shall be restored. If the request is approved, and the employee-unit member has been separated from service for more than thirty (30) days, his/her seniority earned prior to resignation shall not be restored. Re-employment lists shall take precedence over requests for reinstatement.

9.3 Furlough
The City has the prerogative to furlough employees to a maximum of 8 shifts in each fiscal year. The provisions of section 10.1 shall not apply to furloughs. However, the City shall not initiate furlough of the Local 856 IAFF bargaining unit for 2010/11. The determination of whether furloughs are necessary shall not be subject to the grievance procedure; however, the City agrees that before making a final determination, in order to insure, among other things, that furlough hours are equally distributed among bargaining unit members and that bargaining unit work shall not be performed by non-unit members as a result, it will meet and confer with the Association to discuss the parties’ financial situations, alternatives and parameters prior to implementation. This provision regarding furloughs shall sunset on June 30, 2012.

SECTION 10. HOLIDAYS

10.1 Authorized Holidays

The holidays in this City are:

a) January 1st (New Year’s Day)
b) Third Monday in January (Martin Luther King, Jr.’s Birthday)
c) February 12th (Lincoln’s Birthday)
d) Third Monday in February (Washington’s Birthday)
e) Last Monday in May (Memorial Day)
f) July 4th (Independence Day)
g) First Monday in September (Labor Day)
h) November 11th (Veterans Day)
i) Fourth Thursday in November (Thanksgiving Day)
j) Fourth Friday in November (Friday after Thanksgiving Day)
k) December 25th (Christmas Day)
l) June 14th (Flag Day)
j) October 12th (Columbus Day)
10.2 Shift Employees

Shift employees are those employees assigned to the work schedule as defined in Section 7.1. All shift employees shall receive compensation for thirteen (13) eight (8)-hour periods per year at the hourly equivalent rate based on a forty (40)-hour workweek, in lieu of holidays.

56-Hour Fire personnel shall receive seven and one-half (7.5%) holiday-in-lieu pay to be paid out proportionally over each pay period.

A shift employee shall receive prorated holiday compensation upon termination, such compensation to be eight (8) hours at the hourly equivalent rate based on a forty (40) hour workweek for each holiday listed in Section 10.1 which has occurred prior to the employee’s termination date and for which the employee has not received compensation.

10.2 Holiday In Lieu Pay Shift-Unit members

In lieu of observing the holidays listed in section 10.1, the City shall pay bargaining unit members in-lieu compensation for holidays without regard for when holidays occur or whether the unit member actually works on a holiday. In-lieu holiday compensation shall be paid at the rate of 7.5% of what was formerly described as base pay. As stated in Section 5.0, this 7.5% holiday-in-lieu pay is included in the base pay calculation set forth in Appendix A-1, A-2, and A-3 (this total base pay calculation was formerly described as “adjusted base pay.”)

Unit members who will be absent from work on holidays must use available leave as authorized by Section 14 of this MOU.

SECTION 11. VACATIONS

11.1 Eligibility

All employees-unit members shall be entitled to annual vacation leave except employees-unit members serving the first six (6) months of the original twelve (12) months probationary period.

11.2 Vacation Accrual

56-Hour Fire personnel accrue six (6) shifts per year from initial employment date; eight (8) shifts per year after fourth (4th) anniversary date; ten (10) shifts per year after twelfth (12th) anniversary date; and twelve (12) shifts per year after twentieth (20th) anniversary date.
11.2 Vacation Earned And Accrued

A bargaining unit member shall be credited with vacation shifts from the date of his/her regular appointment by the City as a member of the Fire Service each pay period at the rates described in the chart below. For the purpose of determining the amount of vacation shifts credited, an employment year shall be defined as the period of one (1) year from the anniversary date of such appointment by the City.

<table>
<thead>
<tr>
<th>Years of City Service</th>
<th>Hours Per Pay Period (26 pay periods per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st yr. through 5th yr.</td>
<td>3.38</td>
</tr>
<tr>
<td>6th yr. through 10th yr.</td>
<td>4.92</td>
</tr>
<tr>
<td>11th Year</td>
<td>5.23</td>
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<tr>
<td>12th Year</td>
<td>5.54</td>
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<td>13th Year</td>
<td>5.85</td>
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<tr>
<td>14th Year</td>
<td>6.15</td>
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</tr>
<tr>
<td>18th Year</td>
<td>7.69</td>
</tr>
<tr>
<td>19th Year</td>
<td>8.0</td>
</tr>
<tr>
<td>20th Year &amp; Up</td>
<td>8.31</td>
</tr>
</tbody>
</table>

11.3 Time Charged

Vacation time shall be charged on the basis of the actual number of working hours the employee unit member is on vacation to the nearest 1/10th hour.

11.4 Vacation Credits Advance

Employees unit members may take only such vacation as they have accumulated at the time that the vacation begins, except after three (3) years of service the employee unit member may draw upon anticipated vacation credits not to exceed five (5) working days or two (2) shifts per year. At termination of employment, the unit member shall reimburse the City for any vacation taken in excess of vacation credit.

11.5 Vacation Scheduling & Accumulation

The times during the calendar year at which an employee unit member may take her/his vacation shall be determined by the Fire Chief with due regard to the needs of the service and desires of the employee unit member. If requirements of the service or the
desires of the employee unit member are such that an employee unit member must defer part or all of his annual vacation in a particular year, the Fire Chief may permit the employee unit member to take such deferred vacation during the following calendar year. No employee unit member may accumulate more than twice his annual vacation allowance, except that unit members employed in the Battalion Chief classification on August 8, 2016 shall be allowed to accumulate up to a maximum of 576 hours of vacation.

Vacation time shall be taken in full shift increments. Employees shall select their vacation on the basis of seniority. On the first round of vacation selection, employees may select one or more shifts provided multiple shift selections are consecutive. When first round vacation selections have been received and approved, employees may select the balance of their vacation in full or half shift increments. Half shift requests will be limited to a maximum of three (3) in any one year. Full shift requests take precedent over half shift requests. Half shifts can only be scheduled from 0800 to 2000 hours on Saturday and Sunday or from 2000 to 0800 hours any day of the week.

Seniority is determined by date of hire. Unscheduled vacation shifts will be governed by the 96-hour and 48-hour rules as defined in the Department Policies and Procedures Manual.

With the approval of the Fire Chief, one employee per shift shall be allowed to be on vacation leave, provided that when it is known that an overtime liability will occur, same day requests will not be allowed.

11.6 Sick Leave During Vacation

If an employee unit member becomes sick during his vacation, such employee unit member may charge the period of illness against sick leave credits in the same manner as provided in Section 12 (Sick Leave). A doctor's certificate shall be required and shall be submitted prior to such charge against sick leave credits.

11.7 Separation from Service

Employees Unit members who terminate employment shall be paid a lump sum for all accrued vacation leave earned prior to the effective day of termination. Former employees Unit members re-employed by the City shall receive no credit for prior service in determination of vacation benefits.

11.8 Return of Vacation

Members of this unit will be allowed to sell to the City a maximum of 36 hours of vacation leave per year, at the individual's hourly base rate prevailing wage, if the employee unit member has used at least one half of his/her vacation accrual within the last calendar year. The hourly base rate for purposes of this Section 11.8 shall be calculated according to the monthly base rate in Section 5.1 converted to an hourly rate as specified in Section 5.4. The employee unit member must have been with the City for a minimum of five years and must have a minimum of 144 hours of accrued vacation...
before selling vacation to the City. The employee-unit member may sell any amount (at the 56 hour rate) to the City up to 36 hours of vacation but may request such sell back only once per fiscal year. It also must coincide with a regular payroll period, and there must be at least 72 hours vacation balance remaining after the sell back.

11.9 Additional Vacation Purchased

Employees who purchase additional vacation through the City sponsored optional benefit plan may not sell back such vacation prior to the first pay period ending in December of each year. Employees leaving City service prior to the first pay period ending in December of each year shall forfeit any additionally purchased vacation. Such additional vacation shall be expressed in the monetary value (not hours), as stated in the optional benefit plan.

SECTION 12. SICK LEAVE
12.1 Sick Leave Accrual

Shift employees: Unit members shall earn sick leave credit at the rate of 5.53 hours for each two (2) weeks’ service, or a total of six (6) shifts per year.

12.2 Usage

Sick leave shall not be considered a privilege that an employee-unit member may use at his discretion but shall be allowed only in cases of necessity and actual sickness of the unit member or the unit member’s designated family members, as allowed by family illness leave, including necessary physician appointments or disability.

Sick leave shall be charged against an employee-unit member’s sick leave credit as the actual number of hours of the regular work period that the employee-unit member is on sick leave. All employees-unit members shall be entitled to sick leave compensation except employees-unit members serving the first thirty (30) days of the original one (1) year probationary period.

In order to receive compensation while absent on sick leave, an employee-unit member shall notify his immediate supervisor at least thirty (30) minutes prior to or within one-half (1/2) hour after the time set for the beginning of the employee-unit member’s daily duties.

When the absence is for more than one (1) working day, or from the first shift day of illness in the case of shift employees, and where there is a reasonable suspicion of sick leave abuse present, employees may be required to file a physician's statement with the
Department stating the cause of absence, unit members may be required to file a physician’s statement with the department verifying a medical reason for the absence.

12.3 Incapacity to Perform Duties

The City Manager, or where the authority has been delegated by the City Manager, the City Manager’s representative or designee or designee may require any employee who he unit member who City Manager or designee or designee believes may be physically or mentally incapacitated for work to undergo an examination by a physician designated by the City and at the City’s expense. If, as a result of the physician’s examination, the employee unit member is determined to be incapacitated to perform his duties, the City Manager or designee or department director will engage in the interactive process, to the extent required by law, and may place the employee unit member on leave of absence without pay, with due process, provided such action is not in conflict with Government Code Section 4850. An employee who is determined to be incapacitated to perform his duties and disagrees with such determination may choose to be examined by a physician of his choice and expense. If the employee's physician disagrees with the City’s physician, the physicians shall select a third physician whose determination regarding the employee's incapacity to perform his duties shall be final. An employee unit member may use accrued sick leave, vacation or compensatory time prior to being placed on a leave of absence without pay. However, the unit member may be eligible for long-term disability benefits under Section 14.3.2 (Long-Term Disability). Vacation and sick leave credits shall not accrue when an employee unit member is on such leave of absence.

12.4 Sick Leave Accrual

Maximum accrual of 200 days or 100 working shifts. Not applicable to members of this bargaining unit with twenty-five (25) years or service or more. Retiring employees of this unit shall transfer the pay for 50% of unused sick not to exceed 116 shifts or 58 working shifts (i.e., not to exceed a total of 1392 hours) into the a Retirement Health Savings Account. In negotiations for a successor MOU, the parties agree to discuss revisions to this Section 12.4 to reflect the current 10-hour shifts.

12.5 Sick Leave at Retirement

The City has amended its contract with PERS to provide credit for unused sick leave, pursuant to Government Code Section 20965. Sick leave transferred to the HSA account pursuant to Section 12.4 shall not be counted toward PERS credit.

12.6 Sick Leave at Termination

Employees unit members resigning from the City, terminated by the City, otherwise terminating their City employment, or being terminated by the City shall forfeit all unused sick leave benefits as of the termination date. Former employees unit members re-employed by the City shall receive no credit for prior service in determination of sick leave benefits.
SECTION 13. LEAVES OF ABSENCE

13.1 **Family Illness Leave**

As permitted by Labor Code Section 233, a unit member may use up to a maximum of six (6) days per year of the unit member’s accrued sick leave per calendar year to attend to an illness of a child, stepchild, sibling, parent, spouse, or domestic partner of the unit member. All conditions and restrictions placed by the employer upon the use by an unit member of sick leave also shall apply to the use by an unit member of sick leave to attend to an illness of his or her child, parent, spouse, or domestic partner. This Section does not extend the maximum period of leave to which an unit member is entitled under Section 12945.2 of the Government Code or under the federal Family and Medical Leave Act of 1993 (29 U.S.C. Sec. 2606 et seq.), regardless of whether the unit member receives sick leave compensation during that leave. As in use of sick leave for the unit member’s own illness, a doctor’s note may be required if the family member’s illness is more than one day.

13.1.1 **Family Illness Leave**

An employee may use his accrued sick leave up to a maximum of three (3) shifts per year in case his attendance on a member of his immediate family who is ill is required. The Fire Chief's decision shall be final.

13.2 **Jury Duty**

An employee summoned to jury duty shall inform his supervisor and, if required to physically report for jury service, may be absent from duty with full pay; provided, however, the employee-unit member must remit to the City, through the employee’s Fire Chief or unit member’s department director, within fifteen (15) days after receipt, all fees received except those specifically allowed for mileage and expenses. When the employee-unit member is released from jury duty, including court recesses in excess of twenty-four (24) hours each day, he shall report to work promptly for the balance of his scheduled shift or workday.

13.3 **Military Leave**

The provisions of the Military and Veterans Code of the State of California as well as the Uniformed Services Employment and Reemployment Act shall govern military leave of City employees-unit members.

13.4 **Campaign Leave**

Upon becoming a candidate for public office, any regular employee-unit member may request and be granted a leave of absence without pay, to remain in effect for the period of his candidacy.
13.5 Leave of Absence Without Pay

Upon written request, the City Manager, or where the authority has been delegated by the City Manager, the City Manager's representative, may grant an employee, or designee may grant a unit member, a leave of absence without pay for a definite period not to exceed one (1) year. The City Manager's or designee's decision shall be final. Upon expiration of leave of absence, the employee, unit member, shall be reinstated in the position held at the time the leave was granted or to another position in the same classification. Failure of an employee, unit member, on leave to report promptly upon its expiration, or within fifteen (15) days after notice to return to duty, shall result in such employee, unit member's, automatic dismissal. Vacation, sick leave, and seniority credits shall not accrue to an employee, unit member, on voluntary leave of absence. A copy of the letter granting leave shall be forwarded to the Union within ten (10) calendar days of the commencement of the leave.

13.6 Bereavement Leave

An employee shall be granted up to a maximum of seventy-two (72) hours leave of absence without loss of salary or benefits upon the death or the funeral of any of the following persons: spouse, domestic partner, child, father, mother, step father, step mother, brother, sister, step brother, step sister, grandfather, grandmother, grandchildren, mother-in-law, father-in-law. In addition, the City Manager or designee may grant leave to an employee upon the death or the funeral of some other person if, in the opinion of the City Manager or designee, such leave is warranted. The City Manager or designee may approve extensions to such leaves due to unusual circumstances.

In case of death within the immediate family of a unit member, a unit member shall be entitled to remain absent from duty with pay in order to attend the funeral or memorial services, not to exceed five (5) days. Bereavement leave is not to be charged to sick or vacation leave.

For the purpose of this Section 13.6, immediate family is defined as parent, sibling, spouse, domestic partner, child, mother-in-law, father-in-law, brother-in-law, sister-in-law, grandparents, grandchildren, great grandparents, step-children, foster children, or other persons with whom there is a demonstrated child-rearing/parental or immediate familial relationship.

13.7 Absence Without Pay

13.7 Absence Without Official Leave

Failure of an employee, or unit member, to report for duty on a normal working day or shift without notice to the Fire Chief or his department director or designated representative of the reason for such absence within four-one-half (41/2) hours after the time designated as the beginning of the workday shall constitute absence without official leave and without pay. Employees, unit members, should make every effort to
contact the Fire Chief or his department director or designated representative prior to the start of their shift if they plan to be absent.

Absence without official leave for any length of time without satisfactory explanation is cause for dismissal. Absence without official leave for five (5) or more consecutive days shall be deemed a tender of resignation.

13.8 Industrial Leave

Any regular or probationary employee covered by this Memorandum of Understanding who has suffered any disability arising out of and in the course of his employment, as defined by the Workers’ Compensation Laws of the State of California, shall be entitled to the period of such disability to a maximum provided under State Law. During the period the employee is paid by the City, the employee shall assign or endorse to the City any benefit payments received as a result of Workers’ Compensation Insurance coverage. In the event that the payment received by the employee is not endorsed to the City, a payroll deduction for the amount of the payment will be made the payroll period following notification to the City by Workers’ Compensation that the check has been issued to the employee. The City reserves the right to withhold payment of any disability benefits until such time as it is determined whether or not the illness or injury is covered by Workers’ Compensation. The benefits of sick leave and job incurred injury leave shall be mutually exclusive and no disability leave may be used for the purposes specified under Section 12, and no sick-leave benefits may be used for the purposes specified under this Section.

13.9 Use of Accrued Compensatory Leave

One employee per shift shall be allowed to be on compensation leave, provided that no employee is on vacation leave. When it is known that an overtime liability will occur, same day requests will not be allowed. Vacation requests will take precedence over compensation leave requests.

13.8 Disability Leave With Pay

Any regular or probationary unit member occupying a regular position who is absent from duty because of disability caused by illness or injury arising out of and in the course of such unit member’s employment with the City that has been declared to be compensable under workers’ compensation law shall be allowed a disability leave with pay for the period of incapacity as determined by a physician, but not to exceed three hundred sixty-five (365) calendar days for any one illness or injury. The unit member’s compensation during such leave of absence shall be as follows:

First three (3) workdays’ absence, no pay; provided, however, that a unit member may use accrued sick leave credit, if any, during the first three (3) workdays’ absence; and, provided further, that if a unit member is hospitalized or is absent for fifteen (15) or more consecutive workdays as a result of such illness or injury the unit member shall receive full pay, commencing with the first workday’s absence and continuing throughout the period of incapacity but not to exceed thirty (30) consecutive calendar days. Fourth (4th)
workday’s through thirtieth (30th) consecutive calendar day’s absence, full pay throughout the period of incapacity but not to exceed thirty (30) consecutive calendar days from commencement of the disability leave of absence.

Thirty-first (31st) through ninetieth (90th) consecutive calendar day’s absence; seventy-five percent (75%) of full pay throughout the period of incapacity but not to exceed three hundred sixty-five (365) consecutive calendar days from commencement of disability leave of absence.

Ninety-first (91st) through three hundred sixty-fifth (365th) consecutive calendar day’s absence, fifty percent (50%) of full pay throughout the period of incapacity but not to exceed three hundred sixty-five (365) consecutive calendar days from commencement of disability leave of absence.

For unit members who are absent for thirty-one (31) or more consecutive calendar days and are receiving compensation as provided above, accrued sick leave, if any, shall be integrated with the disability leave payments; provided, however, that the sum of the two shall not exceed the unit member’s full pay for the said period and the unused portion of accumulated sick leave will continue to be credited to the unit member. Integration of sick leave credit with disability leave payment is automatic after the thirtieth (30th) consecutive calendar day of absence due to such disability and may not be waived. No disability leave with pay may be granted until the illness or injury is declared compensable under the California workers’ compensation law. During such disability leave of absence, the City may request that a unit member be examined by a physician selected by the City. Disability pay provided by the City shall be reduced by any compensation a unit member received pursuant to the workers’ compensation law. Full pay as used herein shall mean the unit member’s base rate of pay.

13.9 **Family Care and Medical Leave**

13.9.1 **FMLA/CFRA**

Each eligible unit member is entitled to family care and medical leave as provided by the Family and Medical Leave Act (FMLA) and the California Family Rights Act (CFRA), as amended. The leaves under FMLA and CFRA will run concurrently to the extent permitted by law.

13.9.2 **Eligibility**

To be eligible for family care and medical leave, on the date on which leave is to begin, a full-time or part-time unit member must have been employed by the City for at least twelve (12) months, which need not be consecutive, and have actually worked at least 1,250 hours of service during the twelve (12) month period immediately preceding the commencement of the leave.
13.9.3 Family Care and Medical Leave Entitlement

Subject to the provisions of this MOU, City policy, and state and federal law, including the federal FMLA and the CFRA, an eligible unit member is entitled to a total of twelve (12) workweeks of unpaid leave during any twelve (12) month period for any one, or more, of the following reasons:

13.9.3.1 The birth of a child and to care for the newborn child (FMLA and CFRA);

13.9.3.2 The placement with the unit member of a child for adoption or foster care and care for the newly placed child (FMLA and CFRA);

13.9.3.3 To care for the unit member’s child, parent, or spouse who has a serious health condition. (Child is defined as biological, adopted, or foster child, stepchild, legal ward, or child of a person standing in loco parentis who is under 18 years of age or an adult dependent child. Parent is defined as biological, foster or adoptive parent, stepparent, legal guardian, or other person who stood in loco parentis to the unit member when the unit member was a child. Parent does not include a parent-in-law. “Spouse” means partner in marriage or a registered domestic partner as defined in the Family Code and includes same-sex partners in marriage.)

13.9.3.4 Because of a unit member’s own serious health condition that makes the unit member unable to perform the functions of the unit member’s position, except for disability on account of pregnancy, childbirth, or related medical conditions, which is covered by pregnancy disability leave. (Pregnancy disability counts toward only California Pregnancy Disability Leave (PDL) and FMLA leave.)

13.9.3.5 Because of any qualifying exigency arising out of the fact that the unit member’s spouse, son, daughter, or parent is a military member on covered active duty (or has been notified of an impending call or order to covered active duty status) (FMLA only).

The twelve (12) month period for FMLA/CFRA purposes is determined by the fiscal year.

13.9.4 Family Care and Medical Leave to Care for a Covered Unit Member With a Service Injury or Illness

Subject to the provisions of this MOU, City policy, and state and federal law, including the FMLA, an eligible unit member may take FMLA leave to care
for a covered unit member with a serious injury or illness if the unit member is
the spouse, son, daughter, parent, or next of kin of the service member.

13.9.4.1 An eligible unit member’s entitlement under Section 13.9.4 is
limited to a total of twenty-six (26) workweeks of leave during a
single 12-month period to care for a covered service member with
a serious injury or illness. The “single 12-month period” in which
the 26-weeks-of-leave-entitlement described in this begins on the
first day a unit member takes leave to care for the covered service
member.

13.9.4.2 During the “single 12-month period” described above, an eligible
unit member’s FMLA leave entitlement is limited to a combined
total of twenty-six (26) workweeks of FMLA leave for any
qualifying reason.

13.9.5 Pay Status and Benefits

Except as provided in this Article, the family care and medical leave will be
unpaid. The City will, however, continue to provide City contributions toward
the health plan premiums during the period of family care and medical leave
for up to twelve (12) workweeks on the same basis as contributions would
have been provided had the unit member not taken family care and medical
leave. The unit member will be required to continue to pay the unit member’s
share of premiums payments, if any.

13.9.6 Relationship of Family Care and Medical Leave to Other Leaves

Any leave of absence that qualifies as family care and medical leave and is
designated by the City as family care and medical leave will be counted as
running concurrently with any other paid or unpaid leave to which the unit
member may be entitled for the same qualifying reason. A unit member is
required to utilize the unit member’s accrued sick leave for FMLA/CFRA
qualifying absences due to the unit member’s own serious health condition. A
unit member may be required to use accrued vacation leave for FMLA/CFRA
qualifying reasons unrelated to the unit member’s own serious health
condition.

13.9.7 Notice to the City

13.9.7.1 The unit member must provide written notice to the City as far in
advance of the leave as possible and as soon as the unit member
reasonably knows of the need for the leave. If the need for the
leave is foreseeable based on an expected birth, placement of a
child for adoption or foster care or planned medical treatment, the
notice must be provided at least thirty (30) calendar days in
advance of the leave, or if not reasonably known thirty (30)
calendar days before the leave, then as soon as reasonably practicable.

13.9.7.2 The written notice must inform the City of the reasons for the leave, the anticipated duration of the leave and the anticipated start of the leave.

13.9.7.3 The unit member shall consult with the City and make a reasonable effort to schedule any planned medical treatment or supervision so as to minimize disruption to department operations.

13.9.8 Medical Certification

13.9.8.1 A unit member’s request for family care and medical leave to care for a child, a spouse, or a parent who has a serious health condition shall be supported by a certification issued by the health care provider of the individual requiring care. If additional leave is requested after the expiration of the time originally estimated by the health care provider, the unit member shall provide the City with recertification by the health care provider.

13.9.8.2 A unit member’s request for family care and medical leave because of unit member’s own serious health condition shall be supported by a certification issued by the unit member’s health care provider.

13.9.8.3 As a condition of a unit member’s return from leave taken because of the unit member’s own serious health condition, the unit member is required to obtain certification from the unit member’s care provider that the unit member is able to resume work.

13.9.8.4 Required Medical Certification Forms

Unit members are required to use the medical certification forms available from the City Human Resources Department to meet the certification and recertification requirements of this Section.

13.9.9 Minimum Duration of Leave

13.9.9.1 Leave does not need to be taken in one continuous period of time.

13.9.9.2 Leave taken for a serious health condition of the unit member’s child, parent, or spouse of the unit member may be taken intermittently or on a reduced work schedule when medically necessary, as determined by the health care provider of the person with the serious health condition. However, intermittent or reduced work schedule leave may be taken for absences where the unit member or covered family member is incapacitated or unable to perform the essential functions of the position because of a
chronic serious health condition, even if he or she does not receive treatment by a health care provider.

13.9.3 Leave taken for reason of birth, adoption, or foster care placement of a child of the unit member does not have to be taken in one continuous period of time. Any leave(s) taken shall be concluded within one (1) year of the birth of placement of the child with the unit member. The basic minimum duration shall be two (2) weeks. However, the City shall grant a request for a leave of less than (2) weeks’ duration on any two (2) occasions.

13.9.10 City’s Response to Leave Request

It is the City’s responsibility to designate leave, paid or unpaid, as family and medical leave—qualifying based on the information provided by the unit member and to notify the unit member of the designation.

13.9.11 Dual Parent Employment

Where both parents are City unit members, allowable leave for the birth, adoption, or foster care placement of a child is limited to a total of twelve (12) work weeks in a 12-month period between the two (2) unit members. Their family care and medical leave entitlement is not limited or combined for any other qualifying purpose.

13.9.12 Unit Member’s Status on Returning from Leave

Except as provided by law, on return from family care and medical leave, a unit member is entitled to be returned to the same or equivalent position the unit member held when leave commenced, or to an equivalent position with equivalent benefits, pay, and other terms and conditions of employment. A unit member is also entitled to reinstatement even if the unit member has been replaced or the unit member’s job has been restructured to accommodate the unit member’s absence. If a unit member is no longer qualified for the position because, e.g., of the unit member’s inability to renew a license, as a result of the leave, the unit member shall be given a reasonable opportunity to fulfill those conditions upon returning to work. A unit member has no right to return to the same position. Use of family care and medical leave will not result in the loss of any employment benefit that accrued prior to the start of an eligible unit member’s FMLA/CFRA leave.

13.10 Pregnancy Disability Leave

A pregnant unit member is entitled to an unpaid leave of up to four (4) months, as needed, for the period(s) of time the unit member is actually disabled by pregnancy, as determined by her health care provider.
13.10.1 Notice to City

Using the City’s Certification of Health Care Provider form for pregnancy disability leave, a unit member should provide at least thirty (30) days advance notice or notice as soon as practicable of the unit member’s need for pregnancy disability leave or need for reasonable accommodation based on the advice of her health care provider that reasonable accommodation is medically advisable because of pregnancy or a related medical condition.

13.10.2 Use of Sick Leave and Vacation During Pregnancy Disability Leave

A unit member is required to use any accrued sick leave during an otherwise unpaid pregnancy disability leave. A unit member may, at her option, use accrued vacation during an otherwise unpaid portion of a pregnancy disability leave.

13.10.3 Health and Welfare Benefits

The City shall maintain its contribution toward health and welfare benefits under Section 18 (Health and Welfare) during any unpaid portion of a pregnancy disability leave on the same basis that the contribution would have been provided if the unit member had not taken pregnancy disability leave.

13.10.4 Unit Member Status

During a pregnancy disability leave, the unit member shall retain unit member status, and the leave shall not constitute a break in service for any purpose under this MOU except that the leave shall not count toward completion of probation.

13.10.5 Relationship Between Pregnancy Disability, FMLA, and CFRA Leaves

13.10.5.1 A pregnancy disability leave shall run concurrently with the unit member’s FMLA leave entitlement.

13.10.5.2 The right to take pregnancy disability leave is separate and distinct from the right to take leave under CFRA. A unit member’s own disability due to pregnancy, childbirth or related medical conditions is not a “serious health condition” under CFRA.

13.10.5.3 At the end of the unit member’s period(s) of pregnancy disability leave, or at the end of four months of pregnancy disability leave, whichever occurs first, a CFRA-eligible unit member may request to take CFRA leave of up to twelve (12) workweeks for reason of the birth of her child, if the child has been born by this date.
SECTION 14—HEALTH AND WELFARE

[Changes to this Section 14 shall become effective August 20, 2016.]

WELFARE 14.1 Hospitalization
and Medical Care

Effective July 1, 2005 the City will place one thousand two hundred dollars ($1,200) per month in a cafeteria plan for health insurance coverage for employees, or employees with dependents. Any unused health insurance portion of the cafeteria plan contribution will be returned to the cafeteria plan for other health related expenses. Effective January 2007, the City will increase the contribution to the cafeteria plan by CPI (San Francisco Oakland San Jose region—UW/Clerical Workers—August 2006).

Effective February 1, 2009, bargaining unit members participating in the City’s cafeteria plan may choose medical plans under either the CalPERS options or the Teamsters Medical Plan E. Employees electing the Teamsters plan shall be entitled to the following benefits under Teamsters Local 856 Health and Welfare Benefit Trust Fund:

Medical Plan E
Dental 2-AA
Orthodontia
Vision (No Deductible)
Prescription Drugs (No Co-Pay/No Maximum)
Retiree Benefit Plan

Seventy-five percent (75%) the City’s contribution in excess of the amount needed for the medical plan premium for either the CalPERS options or the Teamsters Medical Plan E will be applied at employee’s choice to payment for other health-related expenses, qualifying child care costs, vacation purchase or cash back per the City’s cafeteria plan. Disbursement choices for the employee from the City’s cafeteria plan will include monthly or semi-annual disbursements, but in no event will the employee receive money or sell back time yet to be accrued. The City’s contribution effective February 1, 2009, for CalPERS options shall be $1,022. The City’s contribution effective February 1, 2009, for the Teamsters Medical Plan E shall be $1,154.26.

The City will continue to contribute the PERS mandated City contribution for administrative costs associated with the CAL-PERS Health premium.

At no time will the cafeteria amount and the administrative fee for PERS health ($101.00/mo. 2008) health insurance amount combined exceed the PERS Family rate for the Kaiser Health Plan.

For employees covered by this MOU who retire from the City with a PERS retirement benefit after August 1, 1996, the City shall contribute an amount as specified by PERS per month toward medical premiums. Employee who separate from service without
exercising a PERS retirement benefit at the time of separation are not entitled to this benefit nor will they be entitled to claim this benefit upon subsequent retirement.

14.2 Life Insurance, Long Term Disability and Long Term Care Insurance

Effective May 1, 2005, the City shall contribute towards payment of term life insurance benefits an amount equal to the premium costs up to one (1) times the Battalion Chief’s annual salary for all Battalion Chiefs in this unit.

The City will contribute $16 per month per member to Long Term Disability Insurance through the City.

14.3 Dental Care

The City shall contribute $100 per month to the City-sponsored Dental/Orthodontia insurance for participating employees (and their eligible dependents) not covered by the Teamsters Local 856 Health and Welfare Benefit Trust Fund.

14.4 Changes in Federal or State Laws.

If, pursuant to any federal or state law enacted subsequent to the effective date of this Memorandum of Understanding, the City is required to pay contributions or taxes for hospital, medical, dental or any other benefits to be provided to employees, the City’s obligation to furnish the same shall be suspended and the contributions agreed to be paid monthly herein by the City shall be reduced each month by the amounts which the City if required to expend during any such month in the form of contributions or taxes to support said federal or state health plan.

If, as a result of such a law, the level of benefits provided by such law for any group of employees, or their dependents, is lower in certain categories of services than that provided hereunder, the City, to the extent practicable, shall provide a plan of benefits supplementary to the federal or state benefits so as to make benefits in each category of coverage as nearly comparable as possible to the benefits provided hereunder. The City need only expend for this purpose the actual amount required to achieve parity between the benefits agreed to be provided hereunder and the benefits provided under any federal or state plan as supplemented in the manner here in above-described.

If the benefits provided under the federal or state Act exceed the benefits provided hereunder in each category of coverage, the City shall be under no further obligation to make any contribution in pursuance of this Section.

In the event that the federal or state government enacts a health care program requiring contributions by employees, such employee contributions shall be reimbursed by the City to the amount by which said employee contribution reduces the City’s contribution required under this Section of the Memorandum of Understanding.
If, during the term of this Memorandum of Understanding, pursuant to any federal law, the Employer is required to make contributions to Social Security for any employees, such contributions shall be deducted from the employee’s wages.

14.1 Medical Insurance – City Contributions

Effective August 20, 2016, and continuing for the 2017 and 2018 calendar years, the City will contribute up to the following maximum amounts per month toward the cost of health benefits for each full-time Battalion Chiefs unit member. For the purpose of this Health and Welfare Section, “full-time” means the Battalion Chiefs unit member is assigned to a classification requiring the unit member to work at least twenty (20) hours per week. In the event the actual monthly premium cost is less than the amount shown on the chart below, the City shall retain any savings and shall have no obligation to “cash-out” or pay any Battalion Chiefs unit member the difference. The City and Battalion Chiefs acknowledge the parties may propose changes to Section 14 during the successor contract negotiations in 2018. During the successor contract negotiations, the 2018 contribution levels in this Section 14.1 shall define the status quo ante for City contributions toward the cost of health benefits for each full-time Battalion Chiefs unit member. Battalion Chiefs unit members electing coverage with a cost greater than the amount paid by the City in this Section shall have the difference deducted automatically from the unit member’s pay.
14.1.1 Eligibility

To be eligible for the Teamsters Health and Welfare Trust Fund Benefits, a unit member must be working or on paid status for eighty (80) or more hours in the preceding calendar month. To be eligible for a CalPERS offered medical plan, Battalion Chiefs unit members must meet the criteria established by CalPERS.

The City will continue to offer CalPERS health benefits program and make the necessary employer contributions as contracted with CalPERS for both active and retired participants.

14.1.2 Health In-Lieu Payment Plan

The City will pay a monthly taxable five hundred and fifty dollars ($550) in-lieu payment to a Battalion Chiefs unit member who certifies that he or she is eligible for health insurance coverage through another group health plan, declines City health coverage, and provides the City proof of other health coverage. Changes to the City Health In-Lieu payments shall be effective August 20, 2016. The City shall pay the health in-lieu payment through the

<table>
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<th>Plan</th>
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<th>2018 (5.0% increase effective January 1, 2018)</th>
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</tbody>
</table>
unit member’s regular payroll checks. The Health In-Lieu Payment Plan year shall operate on the calendar year. Battalion Chiefs and unit members on an unpaid leave of absence are not eligible for the Health In-Lieu Payment Plan.

14.1.3 Cafeteria Plan Benefit Form and the 2014-2015 Allocation

Effective August 20, 2016, the City shall terminate the cafeteria plan benefit form and the cash-out portion of the City’s 2015-2016 annual Cafeteria Plan allocation for each Battalion Chiefs unit member. This agreement voids the provision in the “Cafeteria Plan Benefit Form” requiring a Battalion Chiefs unit member to take one-half of the unit member’s accrued vacation prior to utilizing vacation purchased via the Cafeteria Plan Benefit Form.

Effective August 20, 2016, the City shall cease using any and all forms of the “Cafeteria Plan Benefit Form,” and the City shall have no obligation to use health benefit payments to fund a flexible spending account, child care account, purchase vacation days, or cash payments other than the in-lieu payments described in the prior paragraph.

14.2 Dental, Orthodontia, and Vision

14.2.1 Teamsters 856 Dental, Orthodontia, and Vision

Effective August 20, 2016, for each Teamsters 856 unit member enrolled in employee-only, two-party, or family Teamster 856 medical coverage, the City shall contribute an additional one hundred sixty-three dollars ($163) per month per unit member to the Teamsters 856 Trust Fund, and the Teamsters 856 Trust Fund shall provide such unit members with a composite dental, orthodontics, and vision coverage.

14.2.2 City of Pacifica Self-Funded Dental Plan

Effective August 20, 2016, for each unit member not enrolled in the Teamsters 856 medical plan, the City shall contribute up to one hundred nineteen dollars ($119) per month per unit member to the City of Pacifica Self-Funded Dental Plan, and the Self-Funded Plan shall provide the following benefits to covered Battalion Chiefs unit members:

a) The annual per-person deductible is twenty-five dollars ($25) up to a maximum of seventy-five ($75) per family.

b) The maximum annual benefit each calendar year shall be two thousand dollars ($2,000) per eligible Battalion Chiefs unit member and per dependent.

c) A lifetime maximum orthodontia benefit of two thousand dollars ($2,000) for each eligible Battalion Chiefs unit member and dependent.
14.2.3 City of Pacifica VSP Vision Plan

Effective August 20, 2016, for each uni member not enrolled in the Teamsters 856 medical plan, the City shall contribute the following amounts per month per unit member:

a) Unit Member Only - $18.29
b) Unit Member Plus One - $26.52
c) Unit Member Family - $47.56

14.3 Life and Disability Insurance

14.3.1 Life Insurance

The City shall contribute an amount necessary to provide the life insurance in an amount equal to the Battalion Chiefs unit member’s annual salary. Battalion Chiefs unit members in the Battalion Chiefs unit may purchase additional life insurance at their own expense through payroll deduction. Battalion Chiefs unit members may also purchase, through the same voluntary method, life insurance for dependents.

14.3.2 Long-Term Disability Plan

The City shall contribute an amount necessary to provide the long-term disability plan benefits presently in effect for each eligible Battalion Chiefs unit member.

14.4 Domestic Partners Health Benefits

The City will provide medical, dental, and vision benefits for registered domestic partners of Battalion Chiefs bargaining unit members to the same extent, and subject to the same terms and conditions, as medical, dental, and vision benefits are available to spouses of Battalion Chiefs unit members under this MOU. This coverage is conditioned upon the domestic partnership meeting all the criteria of California Family Code Section 297, et seq. and that a valid declaration of domestic partnership has been filed with the Secretary of State pursuant to Family Code Section 297, et seq., registering the domestic partnership. Domestic partners may enroll in the City’s medical, dental, and vision plans pursuant to this Section only to the extent that the City’s carriers provide such coverage.

14.5 Coverage During Unpaid Leave

Except as otherwise provided in this MOU, Battalion Chiefs unit members on City approved unpaid leaves of absence shall continue to receive health and welfare benefits for the period of the leaves if they wish to purchase such benefits at the current group rates, to be paid by the unit member to the City one (1) month in advance.
14.6 **Medical Flexible Spending Account**

To the extent allowed by the Internal Revenue Service, the City will offer IRS qualified flexible medical spending accounts (FSA). Battalion Chiefs unit members may have funds deducted pre-tax from the unit member’s paycheck and deposited into the IRS qualified FSA accounts.

14.7 **Dependent Care Flexible Spending Account**

To the extent allowed by the Internal Revenue Service, the City will offer IRS qualified Dependent Care Flexible Spending accounts. Battalion Chiefs unit members may have funds deducted pre-tax from the unit member’s paycheck and deposited into an IRS qualified Dependent Care Flexible Spending account. If, in its sole discretion, the City determines that administration of the Program will require the services of an outside entity or contractor, participating Battalion Chiefs unit members shall be responsible for paying their share of the outside contractor’s administration fee.

14.8 **Extended Medical, Dental, Prescription Drugs for Battalion Chiefs Unit Members**

Battalion Chiefs unit members incurring an injury not covered by Government Code Section 4850 may be granted a leave of absence without pay in accordance with Section 13.5 – Leave of Absence Without Pay. Upon the granting of such leave of absence, the City shall continue its contribution for medical, dental, prescription drug and vision care as outlined in Sections 14.1 and 14.2 for a maximum period of three (3) consecutive months.

14.9 **Commuter Assistance Account**

To the extent permitted by the Internal Revenue Service, the City will offer an IRS qualified Commuter Plan. Battalion Chiefs unit members may have funds deducted pre-tax from the unit member’s paycheck and deposited into the IRS qualified Commuter Assistance account.

14.10 **Participation in Tax-Sheltered Annuities**

To the extent permitted by the Internal Revenue Service, the City will offer an IRS qualified tax sheltered annuity plan. Battalion Chiefs unit members may have funds deducted pre-tax from the unit member’s paycheck and deposited into the IRS qualified tax sheltered annuity plan account.

14.11 **Participation in IRS 457 Deferred Compensation Plan**

To the extent permitted by the Internal Revenue Service, the City will offer an IRS qualified 457 deferred compensation plan. Battalion Chiefs unit members may have funds deducted pre-tax from the unit member’s paycheck and deposited into the IRS qualified 457 deferred compensation plan.
SECTION 15. UNIFORMS

For 2010/11 Effective the pay period after the City Council approves this MOU, the City shall provide unit members required to maintain and wear a uniform an annual uniform allowance of $775.00 for affected classification, paid at the rate of $30.77 per pay period.

The City shall pay a newly hired unit member covered by this MOU who is required to wear and maintain a uniform an advance credit of three hundred dollars ($300) to be used exclusively to purchase required uniform items. These uniform items shall be considered the property of the City for a period of one (1) year from the newly hired unit member’s date of appointment. Any unit member whose employment is terminated prior to the completion of one (1) year of service shall return all uniform items to the City or refund the full three hundred dollars ($300) uniform credit. Unit members who receive the initial three hundred dollars ($300) uniform credit shall not receive an additional uniform allowance during the unit member’s first year of employment.

classifications to be paid out proportionally over each pay period. Effective July 1, 2011, this allowance shall be set at $575. The City agrees to provide a one-time payment of $300.00 to any personnel who are promoted into an affected classification within this bargaining unit.

SECTION 16.—PROBATIONARY PERIOD

16.1 Duration

All original appointments shall be tentative, and newly hired or promoted Battalion Chiefs shall be subject to a probationary period of not less than twelve (12) months from the date of probationary appointment. Where an employee’s extended absence from work has prevented a full twelve (12) months’ probationary evaluation the probationary period may be extended for the length of the absence in order to provide a full probationary evaluation.

16.2 Time Credited

The probationary period shall start from the date of probationary appointment. Probationary employees—unit members in regular part-time positions shall be credited with that portion of full-time employment that they work in a probationary status. Time worked by an employee in a temporary, extra help, or provisional status shall not count towards completion of the probationary period; provided, however, that time served in a temporary or provisional appointment may be credited to the probationary period upon recommendation of the Fire Chief and approval of the City Manager or designee.

16.3 Regular Status

An employee unit member who is not rejected prior to the completion of the prescribed probationary period shall acquire regular status. Former regular employees unit members appointed from a reemployment eligible list shall be given regular appointments when re-
employed. Regular employees unit members who are demoted to lower classifications shall be given regular appointments in the lower classifications; provided, however, that the employee unit member has had prior regular status in the lower classification.

16.4 Layoff

Former probationary employees unit members whose names were placed on a reemployment eligible list before they achieved regular status shall start a new probationary period when appointed from a reemployment eligible list.

16.5 Transfer

Regular employees unit members who transfer to another position in the same classification shall not be required to undergo a new probationary period in the position into which transferred.

16.6 Probationary Employees Unit members

The City Manager or designee, or where the authority has been delegated by the City Manager or designee, the Fire Chief may terminate a probationary employee unit member at any time during the probationary period without cause, without the right of appeal in any manner, and without recourse to any of the procedures provided in Section 18 hereof, it being understood that a terminated probationary employee unit member does not waive any State or Federal constitutional rights. Notice of termination of a probationary employee unit member shall be in writing.

SECTION 17. DISMISSAL, SUSPENSION OR DEMOTION FOR CAUSE

The City Manager or designee, or where the authority has been delegated by the City Manager or designee, the Fire Chief may discipline, which may include but is not limited to dismissal, suspension for not more than thirty (30) days in any fiscal year, or demotion, any employee unit member for cause in the competitive service. The requirement for cause for termination is inapplicable to probationary employees unit members. Any regular employee unit member in the competitive service who is suspended, demoted or dismissed shall be furnished a written notice of such action. Upon the employee's request, the employee shall be provided a written statement of the reasons for such action.

SECTION 18.–GRIEVANCES

18.1 Definition

A grievance is any dispute that involves the interpretation or application of any provision of this Memorandum of Understanding excluding, however, those provisions of this Memorandum of Understanding, which specifically provide that the decision of any City
official shall be final, the interpretation or application of those provisions not being subject to the grievance procedure.

18.2 Procedure

Grievances shall be processed in the following steps:

Step 1. Fire Chief. A grievance may be filed by an employee unit member in his own behalf, or by a group of employees unit members, or by Teamster Local 856.

Within fourteen (14) calendar days of the event giving rise to a grievance, the aggrieved shall present the grievance in writing to the Fire Chief. Grievances not presented within the time period shall be considered resolved. The grievance shall state the particulars of the grievance and the nature of the determination desired.

The Fire Chief shall meet with the grievant to attempt to settle the grievance and give a written answer to the aggrieved within fourteen (14) calendar days from the receipt of the grievance by the Fire Chief.

Step 2. City Manager or designee. If the grievance is not resolved in Step 1, the aggrieved may, within five (5) calendar days from receipt of the Fire Chiefs answer, present the grievance to the City Manager or designee for consideration. The City Manager or designee shall designate the Administrative Services Director or other representative to investigate the merits of the complaint, to meet with the complainant and to attempt to settle the grievance or to make recommendations to the City Manager or designee. Answer to the grievance shall be made in writing by the City Manager or designee within ten (10) calendar days from receipt of the grievance. No grievance may be further processed under Section 18.2 unless it has been filed in accordance with steps 1 and 2 herein.

Step 3. Adjustment Board. If the parties are unable to reach a mutually satisfactory accord on any grievance which arises and is presented during the term of this Memorandum of Understanding, such grievance shall be submitted to an Adjustment Board comprised of two (2) Union representatives, no more than one (1) of whom shall be either an employee unit member of the City or an elected or appointed official of IBT Local 856, and two (2) representatives of the City, no more than one (1) of whom shall be either an employee unit member of the City or a member of the staff of any organization employed to represent the City in the meeting and conferring process.

Step 4. Arbitration. In the event an Adjustment Board is unable to arrive at a majority decision, either the JET-IBT LOCAL 856 may require that the grievance be referred to an impartial arbitrator who shall be designated by mutual agreement between IBT Local 856 and the City Manager or designee. The fees and expenses of the arbitrator and of a Court Reporter shall be shared equally by IBT Local 856 and the City. Each party, however, shall bear the cost of its own presentation, including preparation and post hearing briefs, if any. Decisions of Adjustment Boards and arbitrators on matters properly before them shall be final and binding on the parties hereto, to the extent permitted by the laws governing General Law Cities in the State of California.
No Adjustment Board and no arbitrator shall entertain, hear, decide or make recommendations on any dispute unless such dispute involves a position in a unit represented by Teamsters 856, Battalion Chiefs and unless such dispute falls within the definition of a grievance as set forth in Section 18.1.

18.3 No Change to Memorandum

Proposals to add to or change this Memorandum of Understanding or written agreements or addenda supplementary hereto shall not be arbitrable and no proposal to modify, amend or terminate this Memorandum of Understanding, nor any matter or subject arising out of or in connection with such proposal, may be referred to arbitration under this Section. Neither any Adjustment Board nor any arbitrator shall have the power to amend or modify this Memorandum of Understanding or written agreements or addenda supplementary hereto or to establish any new terms or conditions of employment.

18.4 Demotion, Suspension and Dismissal Grievances

No grievance involving demotion, suspension or dismissal of an employee unit member will be entertained unless it is filed in writing with the Fire Chief within five (5) days not including Saturdays, Sundays or holidays, of the time at which the affected employee unit member was notified of such action.

The City Manager or designee in pursuance of Section 18.2 (Step 2) above resolves a grievance which involves suspension or discharge, he may agree to payment for lost time or to reinstatement with or without payment for lost time, but in the event the dispute is referred to arbitration and the arbitrator finds that the City had the right to take the action complained of, the arbitrator may not substitute his judgment for the judgment of management and if he finds that the City has such right, he may not order reinstatement and may not assess any penalty upon the City.

18.5 Compensation Complaints

All complaints involving or concerning the payment of compensation shall be initially filed in writing with the Administrative Services Director. Only complaints that allege that employees unit members are in accordance with the provisions of this Memorandum of Understanding shall be considered as grievances. Any other matters of compensation are to be resolved in the meeting and conferring process and if not detailed in the Memorandum of Understanding which results from such meeting and conferring process shall be deemed withdrawn until the meeting and conferring process is next opened for such discussion. No adjustment shall be retroactive for more than thirty (30) days from the date upon which the complaint was filed.

18.6 Mutual Agreement on Changes

No changes in this Memorandum of Understanding or interpretations thereof (except interpretations resulting from Adjustment Board of arbitration proceedings hereunder) will be recognized unless agreed to by the City Manager or designee and the Union.
18.7 No Strike

The Union, its members and representatives, agree that it and they will not engage in, authorize, sanction, or support any strike, slowdown, stoppage of work, curtailment of production, concerted refusal of overtime work, refusal to operate designated equipment (provided such equipment is safe and sound) or to perform customary duties; and neither the Union nor any representatives thereof shall engage in job action for the purpose of effecting changes in the directives or decisions of management of the City, nor to effect a change of personnel or operations of management or of employees not covered by this Memorandum of Understanding.

SECTION 19. TUITION REIMBURSEMENT

An employee shall be reimbursed up to a maximum to Six Hundred Dollars ($600) per fiscal year for tuition and related fees paid for courses of study in an off-duty status if the subject matter content of the course is closely related to the employee's present work assignment, or if the employee is enrolled in a program of study related to the employee's work assignment (declared major). There must be a reasonable expectation that the employee's work performance or value to the City will be enhanced as a result of the course of study.

The employee must submit a claim form for reimbursement to his Fire Chief, giving all the information needed for an evaluation of the request. The Fire Chief shall recommend approval or disapproval and forward the request to the Administrative Services Director, whose decision shall be final. If a course is approved and later found to be unavailable, a substitute course may be approved after enrollment.

Upon completion of the course, a copy of the grade sheet or certificate must be filed in the Personnel Office for placement in the employee's personnel file. All reimbursements must be returned to the City in full if the employee does not achieve at least a "C" grade. Upon leaving City employment, employees are not required to refund any such reimbursement to the City.

SECTION 20. EDUCATIONAL INCENTIVE PROGRAM

20.1 The City agrees to continue the Education Incentive Program in effect as of March 1, 2005 as follows:

1. Fire Battalion Chiefs

For the possession of any one or all of the following, affected employees of this bargaining group shall receive three and one half percent (3.5%) increase to their base pay:

Chief Officer’s Certificate OR
B.A./B.S. Degree
20.2 For individuals who currently do not meet the required BA/BS or Chief Officer, but are receiving educational incentive pay, they can continue to receive compensation three and one-half (3.5) through June 30, 2007 or until they qualify for educational incentive pay under the above-noted terms.

20.3 For successful completion of the following course work each calendar year, affected employees shall receive five percent (5%) increase to their base pay:

20.4 Completions of forty (40) hours of course work subject to the approval of the Fire Chief or Chief's designee including, but not limited to:

- Fire Inspection Practices—Command/Tactics Instructor

20.5 Eligible course work completed between January 1 and December 31 of each respective calendar year shall qualify employees for educational incentive pay for the following calendar year respectfully.

20.6 Members of the Unit are eligible to participate in the City's tuition reimbursement program per City policy and procedure.

SECTION 19.—PROMOTIONAL TEST SCORES

The City shall provide, upon request, the promotional test score to an individual who participated in the testing process. Scores of other persons taking the test or the ranking of individuals shall not be provided.

SECTION 20.—RETIREMENT PLAN

The City shall continue its contract with the Public Employee's Retirement System (PERS) to provide a retirement plan which includes one (1) year final compensation average, 1959 survivors benefit plan, military buyback provision and the Fourth Level Survivors Benefit.

The City will continue to provide the 3% at age 55 retirement benefit to all unit members.

The City has implemented the provisions of 414(h) 2 of the Internal Revenue Service Code. These provisions allow an employee to make his/her 9% contribution to PERS on a pre-tax basis. The parties acknowledge that any change in the FYI 2012/13 contribution rate from the FY 2011/12 contribution rate will result in further discussion of this cost in negotiations sessions toward a successor agreement.
20.1 **City’s Contract with CalPERS**

The City shall continue its contract with the California Public Employees Public Retirement System (CalPERS) for all active Battalion Chief unit members. For Tier One Battalion Chief unit members described in Section 20.4, the City’s contract with CalPERS shall include the 1959 survivors benefit plan, and credit for unused sick leave.

All the retirement benefits provided to Battalion Chief unit members are described in this Section 20 or in the City’s contract with CalPERS.

20.2 **CalPERS Election about Battalion Chiefs Unit Member’s Payment of City’s Pension Costs**

The parties acknowledge that CalPERS mandates an election of Battalion Chief unit members, separate from ratification of this MOU, to provide for the cost sharing pursuant to Government Code Section 20516 described in this Section 20. As soon as practicable after the effective date of this MOU, the City will initiate the contract amendment process. Upon approval and agreement from Battalion Chief bargaining unit and completion of the City’s amendment to the CalPERS contract, Battalion Chief unit member contributions will be made pursuant to Government Code Section 20516, and shall extend beyond the expiration of this MOU. The Battalion Chief unit members and the City will take all actions necessary to implement the Government Code Section 20516 pension cost sharing agreement described in this Section 20.

20.3 **Battalion Chiefs Unit Member’s Payment of City’s Pension Costs**

Because the contract amendment between the City and CalPERS will not be complete before the effective date of the cost sharing described in this Section 20, the cost sharing initially shall be implemented outside of a CalPERS contract amendment as authorized by Government Code Section 20516(f), and shall extend beyond the expiration of this MOU. The Battalion Chief unit members, and the City will take all actions necessary to implement the Government Code Section 20516(f) pension cost sharing agreement described in this Section 20 effective August 20, 2016 (concurrently with the salary schedule increase provided by Section 5.3.1).

20.4 **Tier One: Safety 3.0% at 55 Retirement Program – Battalion Chiefs Bargaining Unit Members Hired On or Before December 31, 2012 and Battalion Chiefs Unit Members Eligible for Reciprocity**

This Section 20.4 (including subsections) shall apply to Battalion Chief bargaining unit members hired on or before December 31, 2012. In addition, this Section 20.4 (including subsections) shall apply to Battalion Chief bargaining unit members hired on or after January 1, 2013, who are qualified for pension reciprocity as stated in Government Code Section 7522.02(c) and related CalPERS reciprocity requirements.
20.4.1 3% at 55 Pension Formula

The “3% at 55” retirement program will be available to bargaining unit members covered by this Section 20.4.

20.4.2 Final Compensation Based On Twelve Month Period

For purposes of determining a retirement benefit, final compensation for bargaining unit members covered by this Section 20.4 shall mean the highest twelve (12) consecutive month period as specified in Government Code Section 21362.2.

20.4.3 Required Bargaining Unit Member Contribution

Each bargaining unit member covered by this Section 20.4 shall continue to pay through payroll deduction the nine percent (9.0%) required bargaining unit member contribution.

20.4.4 Additional Required Bargaining Unit Member Contribution

Each bargaining unit member covered by this Section 20.4 shall continue to pay through payroll deduction the nine percent (9.0%) required bargaining unit member contribution as described above. Effective the first pay period after City Council approval of this MOU, each bargaining unit member covered by this Section 20.4 shall pay, through payroll deduction, an additional five percent (5.0%) of PERSable compensation towards the City’s costs for a total contribution of fourteen percent (14.0%) toward the normal costs of pension benefits as permitted by Government Code Section 20516. The parties acknowledge that CalPERS mandates an election of unit members, separate from ratification of this MOU, to approve this paragraph of Section 20.4.4 of the MOU. For this reason, this paragraph shall be subject to and contingent upon the Battalion Chiefs bargaining units’ approval and agreement to implement through payroll deduction, an additional five percent (5.0%) of PERSable compensation for a total contribution of fourteen percent (14.0%) toward the normal cost of pension benefit.

20.4.5 No City Intention to Impose

Because Battalion Chief bargaining unit members have voluntarily agreed to contribute five percent (5.0%) toward the City’s pension costs, the City agrees not to unilaterally impose an additional three percent (3.0%) unit member contribution after 2018 as permitted by Government Code Section 20516.5.

20.5 Tier Two: New Retirement Tier for Safety Bargaining Unit Members in Battalion Chiefs Hired On or After January 1, 2013

Effective January 1, 2013, this Section 20.5 (including subsections) shall apply to Battalion Chiefs bargaining unit members who were hired or on after January 1, 2013.
and who do not qualify for pension reciprocity as stated in Government Code Section 7522.02(c).

20.5.1 2% @ 50 – 2.7% @ 57 Pension Formula

As required by Government Code Section 7522.25, the safety Option Plan Two (2% @ 50 – 2.7% @ 57) pension formula shall apply to bargaining unit members covered by this Section 20.5.

20.5.2 Final Compensation Based On Three Year Average

As required by Government Code Section 7522.32, effective January 1, 2013, for the purposes of determining a retirement benefit, final compensation shall mean the highest annual average pensionable compensation earned during thirty-six (36) consecutive months of service.

20.5.3 Required Unit Member Contribution

As required by Government Code Section 7522.04(g), bargaining unit members covered by this Section 20.5 shall pay, through payroll deductions, fifty percent (50%) of normal costs.

20.5.4 Additional Required Bargaining Unit Member Contribution

Each bargaining unit member covered by this Section 20.5 shall continue to pay fifty percent (50%) of normal costs as described above. Effective the first pay period after the City Council approval of this MOU, in addition to paying fifty percent (50%) of normal costs, bargaining unit members covered by this Section 20.5 shall pay, through payroll deduction, an additional five percent (5.0%) of PERSable compensation toward the City’s normal cost of pension benefits as permitted by Government Code Section 20516. The parties acknowledge that CalPERS mandates an election of unit members, separate from ratification of this MOU, to approve this paragraph of Section 20.5.4 of the MOU. For this reason, this paragraph shall be subject to and contingent upon the Battalion Chiefs bargaining units’ approval and agreement to implement through payroll deduction, an additional five percent (5.0%) of PERSable compensation towards the City’s costs.

20.6 Implementation of Internal Revenue Code Section 414(h)(2)

As permitted by Internal Revenue Code Section 414(h)(2) and Government Code Section 20516, each Battalion Chief unit member shall pay through payroll deductions the PERS contributions described in this Section 20 with state and federal income tax on the PERS member contribution deferred to the extent permitted by Internal Revenue Code, 26 USC Section 414(h)(2).
20.7 **Definition of Status Quo Ante**

For Battalion Chiefs, after this MOU terminates on June 30, 2018, the status quo ante for all purposes, including any state statute shall be defined as the current language of Section 20.

**SECTION 21. TRANSITIONAL WORK**

Bargaining unit members who have sustained an industrial injury or illness that prevents the unit member from performing the full duties of the unit member's position may be eligible for temporary transitional work. A bargaining unit member who is a qualified individual with a disability under the California Fair Employment and Housing Act and/or the Americans with Disabilities Act, may be eligible for temporary transitional work as a reasonable accommodation when such work is available and does not constitute an undue burden for the Department. The City will comply with the requirements of law in considering and granting transitional work.

**SECTION 22. LIGHT DUTY**

An employee shall be permitted to participate in the light duty program during the employee's regular scheduled hours of work.

Employees shall be paid their regular rate of pay for those hours of participation in the light duty program.

An employee who trades a shift with an employee on light duty shall be required to perform all the duties of the job. The shift trade policy as provided in Section 7.5 shall remain in effect.

The determination of an employee's disability and the employee's eligibility for participation shall be rendered by a physician.

**SECTION 23. COMMON MESS**

The provisions of this Section are adopted to assure that all members of fire companies will be available at all times to respond to emergency calls as quickly and efficiently as possible.

All employees unit members on each shift at each station shall attend a common mess at the station for consumption of meals. Such members shall contribute in equal shares for the cost of the meals. The City shall not be financially liable or responsible for the cost of any meal, or the preparation thereof, or for the collection of any funds, or for any other costs undertaken in connection with the provisions of this Section.

**SECTION 23. SEPARABILITY OF PROVISIONS**

In the event that any provision of this Memorandum of Understanding is declared by a court of competent jurisdiction to be illegal or unenforceable or is rendered void by state or federal legislative enactment, that provision of the Memorandum of Understanding shall be null and
void but such nullification shall not affect any other provision of this Memorandum of Understanding, all of which other provisions shall remain in full force and effect.

SECTION 24. PAST PRACTICES AND EXISTING MEMORANDA OF UNDERSTANDING

Continuance of working conditions and practices not specifically authorized by ordinance or by resolution of the City Council is not guaranteed by this Memorandum of Understanding. This Memorandum of Understanding shall supersede all existing memoranda of understanding and any side letters not incorporated into this MOU between the City and the Union.

SECTION 25. TERM OF AGREEMENT

The parties acknowledge that this MOU must be presented to and approved by the City of Pacifica City Council. This MOU shall become effective on the date approved by the City Council, except as specifically described in any article, and shall remain in full force and effect up to and including June 30, 2018.

SECTION 26. NEGOTIATIONS FOR A SUCCESSOR MEMORANDUM OF UNDERSTANDING

No later than April 1, 2018, the City and the Teamsters 856 Miscellaneous shall begin negotiations for a successor Memorandum of Understanding by exchanging initial conceptual proposals.

Made and entered into this ___ day of ______________.

FOR TEAMSTERS LOCAL UNION No. 856

CITY OF PACIFICAIBT

By ________________________________ By
Joe L. thier, President Teamsters Local 856 Stephen A. Rhodes, City Manager

Attest: ________________________________ Appro

____________________
Kathy O'Connell, City Clerk

SIDE LETTER BY AND BETWEEN FOR CITY OF PACIFICA ("CITY") AND FIRE BATTALION CHIEFS, TEAMSTERS LOCAL 856
Relating to the Memorandum of Understanding ("MOU") of July 1, 2010 — June 30, 2012

Section 7.1 Work Schedule

Battalion Chiefs assigned to 40 hour per week (4 x 10 hour per day) shift schedules will work holidays. As an assigned shift, the 40 hour per week schedule, shall receive seven and one-half (7.5%) holiday-in-lieu pay to be paid out proportionally over each pay period. Any employee in a 40 hour per week shift will need to take 10 hours of leave should they take an Authorized Holiday (Section 10.1).

By: Peter Finn, Secretary-Treasurer
    Principal Officer
    Teamsters Local Union 856

By: Joe Penko, Battalion Chief
    Assistant City Manager or designee

By: William Wilson, Battalion Chief

Approved to form:

By: Michelle Marchetta Kenyon
    City Attorney

attachment: MOU - FIRE BATTALION CHIEFS - FINAL (2022: MOU - Pacifica Battalion Chiefs Teamsters, Local 856)
APPENDIX A-1

2010-2016 Battalion Chiefs Salary Schedule

<table>
<thead>
<tr>
<th>Monthly Salary Range 2010 – 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Salary ranges in effect before MOU effective date)</td>
</tr>
</tbody>
</table>

$9,294 - $10,796

The salary ranges listed above are the base rates with 7.5% holiday-in-lieu pay included.
APPENDIX A-2

2016-2017 Battalion Chiefs Salary Schedule

Monthly Salary Range 2016 – 2017
(Effective the first pay period after Council approval of MOU; reflects 9% increase over 2010-2016)

$10,130 - $11,768

The salary ranges listed above are the base rates with 7.5% holiday-in-lieu pay included. See Section 20 for pension cost sharing requirements.
APPENDIX A-3

2017-2018 Battalion Chiefs Salary Schedule

<table>
<thead>
<tr>
<th>Monthly Salary Range 2017 – 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Effective July 1, 2017; reflects 2% increase over 2016-2017 schedule.)</td>
</tr>
<tr>
<td>$10,333 - $12,003</td>
</tr>
</tbody>
</table>

The salary range listed above are the base rates with 7.5% holiday-in-lieu pay included. See Section 20 for pension cost sharing requirements.

ATTACHMENT A

IVIOU SALARY SCHEDULE

BATTALION CHIEFS

Jury 1, 2010 through June 30, 2012

<table>
<thead>
<tr>
<th>Ran • e Effective Jul 1:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
</tr>
<tr>
<td>Holiday Pay (7.8% of base)</td>
</tr>
<tr>
<td>Adjusted Base</td>
</tr>
<tr>
<td>Education Incentive (8.5% of adjusted base)</td>
</tr>
<tr>
<td>Uniform Allowance</td>
</tr>
<tr>
<td>Salary in IVIOU</td>
</tr>
</tbody>
</table>

No increases for the life of the contract.
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SUBJECT:
Local Hazard Mitigation Plan Update

RECOMMENDED ACTION:

Adopt Resolution accepting all of Volume 1 and the City of Pacifica’s portion of Volume 2 of the San Mateo County Hazard Mitigation Plan Update.

ALTERNATIVE ACTION:
None recommended.

STAFF CONTACT:
Joe Spanheimer
Police Captain
spanheimerj@pacificapolice.org
650-738-7314

BACKGROUND/DISCUSSION:

Hazard Mitigation Planning in San Mateo County:

In December of 2015, a coalition of San Mateo County cities and special districts embarked on a planning process to prepare for and lessen the impacts of specified natural hazards by updating the San Mateo County Hazard Mitigation Plan. Responding to federal mandates in the Disaster Mitigation Act of 2000 (Public Law 106-390), the partnership was formed to pool resources and to create a uniform hazard mitigation strategy that can be consistently applied to the defined planning area and used to ensure eligibility for specified grant funding success.

This effort represents the second comprehensive update to the initial hazard mitigation plan, approved by the Federal Emergency Management Agency (FEMA) in November of 2005 and developed in partnership with the Association of Bay Area Governments (ABAG), as well as a return to a truly regional effort following the 2010 planning process. The 29 member coalition of partners involved in this program includes unincorporated San Mateo County, 18 city and town governments and 10 special districts. The planning area for the hazard mitigation plan was defined as all incorporated and unincorporated areas of San Mateo County. The result of the organizational effort will be a FEMA and California Office of Emergency Services (CalOES) approved multi-jurisdictional, multi-hazard mitigation plan.
Mitigation is defined in this context as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. Mitigation planning is the systematic process of learning about the hazards that can affect the community, setting clear goals, identifying appropriate actions and following through with an effective mitigation strategy. Mitigation encourages long-term reduction of hazard vulnerability and can reduce the enormous cost of disasters to property owners and all levels of government. Mitigation can also protect critical community facilities, reduce exposure to liability, and minimize post-disaster community disruption.

The hazard identification and profiling in the hazard mitigation plan addresses the following hazards of concern within the planning area:

1. Dam failure
2. Earthquake
3. Flood
4. Landslide
5. Severe weather
6. Tsunami
7. Wildfire

Climate change is incorporated as a summary assessment of current and anticipated impacts for each identified hazard of concern.

With the exception of dam failure, this plan does not provide a full risk assessment of human-caused hazards. However, brief, qualitative discussions of the following hazards of interest are included: terrorism, cyber threats, hazardous materials release, pipeline and tank failure, airline incidents.

A Planning Team consisting of local officials has taken the lead in developing the hazard mitigation plan. All participating local jurisdictions have been responsible for assisting in the development of the hazard and vulnerability assessments and the mitigation action strategies for their respective jurisdictions and organizations. The Plan presents the accumulated information in a unified framework to ensure a comprehensive and coordinated plan covering the entire San Mateo County planning area. Each jurisdiction has been responsible for the review and approval of their individual sections of the Plan.

Additionally, the plan has been aligned with the goals, objectives and priorities of the State’s multi-hazard mitigation plan.

A 10 member Steering Committee (SC) composed of representative stakeholders was formed early in the planning process to guide the development of the Plan. In addition, residents were asked to contribute by sharing local knowledge of their individual area’s vulnerability to natural hazards based on past occurrences. Public involvement has been solicited via a comprehensive public outreach campaign that included two rounds of public meetings, web-based information, a questionnaire, and multiple social media updates.

**Why adopt this Plan?**

Once the hazard mitigation plan is adopted by all of the jurisdictional partners and approved by FEMA, the partnership will collectively and individually become eligible to apply for hazard
mitigation project funding from both the Pre-Disaster Mitigation Grant Program (PDM) and the Hazard Mitigation Grant Program (HMGP).

**What is the Pre-Disaster Mitigation competitive grant program?**

The PDM competitive grant program provides funds to State, Tribal, and local governments for pre-disaster mitigation planning and projects primarily addressing natural hazards. Cost-effective pre-disaster mitigation activities reduce risk to life and property from natural hazard events before a natural disaster strikes, thus reducing overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. Funds will be awarded on a competitive basis for mitigation planning and project applications intended to make local governments more resistant to the impacts of future natural disasters.

**What is the Hazard Mitigation Grant Program?**

Authorized under Section 404 of the Stafford Act, the HMGP administered by FEMA provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.

**Where do we go from here?**

Upon adoption of Volume I and the City of Pacifica Annex of Volume II of the San Mateo County Hazard Mitigation Plan Update (HMP) and subsequent approval of said plan by CalOES and FEMA, the City of Pacifica will be eligible to apply for specified grants. The grant funds are made available to states and local governments and can be used to implement the long-term hazard mitigation measures specified within the City of Pacifica annex of the HMP before and after a major disaster declaration. The HMP is considered a living document such that, as awareness of additional hazards develops and new strategies and projects are conceived to offset or prevent losses due to natural disasters, the HMP will be evaluated and revised on a continual 5-year time frame.

**FISCAL IMPACT:**

Adoption of this resolution accepting Volume I and the City of Pacifica Annex to the Local Hazard Mitigation Plan will ensure Pacifica’s eligibility for future federal grant funding.

**ORIGINATED BY:**

Police

**ATTACHMENT LIST:**

Final - City of Pacifica (PDF)
HMGP and PDM Fact Sheet (PDF)
San Mateo HMP - Volume I - Final Revised (PDF)
San Mateo County APA Letter 9.1.2016 (PDF)
RESOLUTION NO. (ID # 2013)

CITY COUNCIL RESOLUTION NO.____-2016

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PACIFICA
AUTHORIZING THE ADOPTION OF THE
SAN MATEO COUNTY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all of San Mateo County has exposure to natural hazards that increase the risk to life, property, environment and the County’s economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of San Mateo County, Cities, Towns and Special Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the San Mateo County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Pacifica:

1.) Adopts in its entirety, Volume I and the introduction, chapter 13 - the City of Pacifica jurisdictional annex, and the appendices of Volume II of the San Mateo County Hazard Mitigation Plan (HMP).

2.) Will use the adopted and approved portions of the HMP to guide pre- and post-disaster mitigation of the hazards identified.

3.) Will coordinate the strategies identified in the HMP with other planning programs and mechanisms under its jurisdictional authority.

4.) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the HMP.

5.) Will help to promote and support the mitigation successes of all HMP Planning Partners.

PASSED AND ADOPTED at a regular meeting of the City Council of the City of Pacifica, California, held on September 12, 2016, by the following vote:

AYES, Council Members:
NOES, Council Members:
ABSENT, Council Members:
ABSTAIN, Council Members:

Sue Digre, Mayor

ATTEST:

Kathy O’Connell, City Clerk

APPROVED AS TO FORM:

Michelle Marchetta Kenyon, City Attorney
13.1 Hazard Mitigation Plan Point of Contact

Primary Point of Contact
Joseph Spanheimer, Police Captain
2075 Coast Highway
Pacifica, CA 94044
Telephone: 650-738-7319
e-mail Address: spanheimerj@pacificapolice.org

 Alternate Point of Contact
Christian Murdock, Associate Planner
1800 Francisco Boulevard
Pacifica, CA 94044
Telephone: 650-738-7444
e-mail Address: murdockc@ci.pacifica.ca.us

13.2 Jurisdiction Profile

The following is a summary of key information about the jurisdiction and its history:

- **Date of Incorporation**—November 22, 1957
- **Current Population**—37,806 (as of January 1, 2016 – CA DOF)
- **Population Growth**—Projected population, 2020: 39,300; 2030: 39,600 (Source: Association of Bay Area Governments (ABAG) Projections 2009)
- **Location and Description**—The City of Pacifica is spread along a six mile (10 km) stretch of coastal beaches and hills in north central California. The city comprises several small valleys spread between Sweeney Ridge in the east, Montara Mountain to the south, and the Pacific Ocean’s rocky bluffs to the west. State Route 35 comprises the city’s eastern border. Pacifica is bordered by Daly City on the north, the cities of South San Francisco and San Bruno to the east, as well as several miles of Golden Gate National Recreation Area (GGNRA). Pacifica is bordered by unincorporated San Mateo County area to the south.
- **Brief History**—Before European settlers arrived, Pacifica was home to two significant Ohlone Indian villages: Pruristac located at San Pedro Creek near present day Adobe Drive, and Timigtac on Calera Creek in the Rockaway Beach neighborhood. Pacifica is the location of the oldest European discovery of the San Francisco Bay. An expedition led by Gaspar de Portolà sighted the bay by climbing the hills of Sweeney Ridge in Pacifica on October 31, 1769. Before then, earlier Spanish maritime explorers of the California coast (such as Juan Cabrillo and Sebastian Vizcaino) had missed the San Francisco Bay because heavy fog so frequently shrouded the entrance of the San Francisco Bay into the Pacific Ocean (the Golden Gate). Pacifica is also the site of the still extant Mexican-era Sánchez Adobe built in 1846. The city is located on a part of the Mexican land grant Rancho San Pedro given to Francisco Sanchez in 1839.

Pacifica remained a mainly agricultural and undeveloped area until land speculators, stimulated by construction of the Ocean Shore Railroad in 1905, subdivided and developed a series of small...
coastside communities including Edgemar, Vallemar, Sharp Park, Pedro Point, and Rockaway Beach. These communities, together with Pacific Manor, Westview, Fairway Park, and Linda Mar, incorporated in 1957 as the City of Pacifica. The City grew rapidly in the 1950s and 1960s, and most of its current housing – 54 percent as of 2010 – was built during those decades. Growth slowed in the 1970s, and then slowed further in the following decades, owing to the scarcity of developable land and infrastructure constraints.

- Climate—Pacifica has a cool summer Mediterranean climate typical of coastal areas of California. Based on National Weather Service records, average January temperatures range from 45.8 °F to 56.7 °F and average September temperatures range from 53.9 °F to 71.8 °F. Annual precipitation averages 30.29 inches. There are an average of 66 days annually with measurable precipitation, most of which falls from October through May. Summer fog often produces light drizzle in the night and morning hours. Condensation from the fog also produces fog drip from trees overnight. No measurable snowfall has been recorded since records began. The southeastern portions of the city, such as Park Pacifica, are known to be much sunnier than the rest of the city.

- Governing Body Format—The City of Pacifica is governed by a city council of five elected members, with each council seat in turn serving as mayor for a one-year term. A City Manager, City Attorney and City Clerk are appointed and serve in support of the Council to enact the ordinances passed by the Council, which meets biweekly on the second and fourth Mondays of the month. The Pacifica City Council assumes responsibility for the adoption of this plan; the Planning Department in conjunction with the Emergency Manager will oversee its implementation.

- Development Trends—The City of Pacifica is largely built-out in areas with development potential. A significant portion of the City’s land area is set aside as permanent open space, with no potential for future development. The result is that most projects in the City involve redevelopment of obsolete or underutilized sites. Since the overwhelming majority of Pacifica’s developed land area is dedicated to residential use, most development projects reviewed by the City relate to infill development on scattered vacant lots, or significant renovations or redevelopment of existing structures. Overall, the level of development activity in Pacifica over the past several years has been relatively low in comparison to other cities in San Mateo County.

13.3 Capability Assessment

An assessment of legal and regulatory capabilities is presented in Table 13-1. An assessment of fiscal capabilities is presented in Table 13-2. An assessment of administrative and technical capabilities is presented in Table 13-3. Information on National Flood Insurance Program (NFIP) compliance is presented in Table 13-4. Classifications under various community mitigation programs are presented in Table 13-5. An assessment of education and outreach capabilities is presented in Table 13-6.
### TABLE 13-1. LEGAL AND REGULATORY CAPABILITY

<table>
<thead>
<tr>
<th></th>
<th>Local Authority</th>
<th>Other Jurisdiction Authority</th>
<th>State Mandated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building Code</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Comment:</strong> Pacifica Municipal Code (PMC) Title 8; § , Ord. 799, eff. 12/25/2013</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoning Code</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Comment:</strong> PMC Title 9, Chapter 4; §22.02, Ord. 363</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subdivisions</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Comment:</strong> PMC Title 10; §7, Ord. 456-85, eff. 12/25/1985</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stormwater Management</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Comment:</strong> PMC Title 6, Chapter 12; §1, Ord. 617-C.S., eff. 7/27/1994</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-Disaster Recovery</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Comment:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real Estate Disclosure</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Comment:</strong> Sewer Laterals: PMC Title 6, Chapter 13, Article 6; §1, Ord. 784 C.S., eff. 12/28/2011</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active Faults: Alquist-Priolo Earthquake Fault Zoning Act, CA.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA. State Civil Code 1102 requires full disclosure on Natural hazard Exposure of the sale/re-sale of any and all real property.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth Management</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Comment:</strong> PMC Title 9, Chapter 5; §1, Ord. 604-C.S., eff. 7/8/1993</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site Plan Review</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Comment:</strong> PMC Title 9, Chapter 4, Article 32; §13.01, Ord. 363, as amended by §II (A), Ord. 489-C.S., eff. 10/14/1987, §3, Ord. 541-C.S., eff. 1/10/1990, §3, Ord. 582-C.S., eff. 1/8/1992, and §II(A), Ord. 613-C.S., eff. 4/13/1994, §1, Ord. No. 771-C.S., eff. 6/24/2010 PMC Title 9, Chapter 4, Article 43; §VI, Ord. 610-C.S., eff. 3/16/1994</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Protection</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Comment:</strong> General Plan Conservation Element; 1980 Preservation of Heritage Trees: PMC Title 4, Chapter 12; §1, Ord. 542-C.S., eff. 1/10/1990</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flood Damage Prevention</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Comment:</strong> PMC Title 7, Chapter 5; §1, Ord. 506-C.S., eff. 7/27/1988</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Management</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Comment:</strong> PMC Title 7 Chapter 2 §4-2.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Climate Change</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Comment:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Comment:</strong> Title 6, Chapters 6-11, 13 (Sewer System and Wastewater)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General or Comprehensive Plan</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Is the plan equipped to provide linkage to this mitigation plan?</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 13-1. LEGAL AND REGULATORY CAPABILITY

<table>
<thead>
<tr>
<th>Local Authority</th>
<th>Other Jurisdiction Authority</th>
<th>State Mandated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comment:** The City’s 1980 General Plan preceded the Disaster Mitigation Act of 2000 and has not been amended to specifically link to the Local Hazard Mitigation Plan (LHMP). However, the General Plan contains a Seismic Safety and Safety Element that addresses various potential hazards facing the City and policies and action programs to address them. The 2014 update of the General Plan does contain direct references to the LHMP and hazards of concern.

**Capital Improvement Plan:**

| Yes | No | No |

**Comment:** The City of Pacifica’s current Capital Improvement Plan (CIP) is a planning tool used to prioritize capital projects for the 2015-2020 years. The plan is updated every year identifying new projects and updating the status of existing projects. These projects include various infrastructure maintenance, storm drain improvements, parks and play field upgrades, and sewer facility improvements.

**Floodplain or Watershed Plan:**

| No | No | No |

**Comment:**

**Stormwater Plan:**

| Yes | No | No |

**Comment:** Municipal Regional Permit (MRP) for Stormwater Discharges (Final Order No. R2-2009-0074). Regulates stormwater discharges in new development designs and during construction by requiring Best Management Practices (BMPs). City enforcement supplemented by San Francisco Bay Regional Water Quality Control Board.

**Habitat Conservation Plan:**

| No | No | No |

**Comment:** N/A

**Economic Development Plan:**

| Yes | No | No |

**Comment:** Plan accepted by City Council in 2013

**Shoreline Management Plan:**

| No | No | No |

**Community Wildfire Protection Plan:**

| No | No | No |

**Comment:**

**Forest Management Plan:**

| No | No | No |

**Comment:**

**Climate Action Plan:**

| Yes | No | Yes |

**Comment:** Climate Action Plan; 7/14/2014

**Other:**

| Yes | No | No |

**Comment:** Local Coastal Land Use Plan

**Comprehensive Emergency Management Plan:**

| Yes | Yes | No |

**Comment:** San Mateo County Emergency Operations Plan May 2014, San Mateo County Emergency Operations Plan w/ Annexes, fall 2015

**Threat & Hazard Identification & Risk Assessment:**

| No | Yes | No |

**Comment:** San Mateo County Hazard Vulnerability Assessment, Jan 2015

**Post-Disaster Recovery Plan:**

| Yes | No | No |

### TABLE 13-1. LEGAL AND REGULATORY CAPABILITY

<table>
<thead>
<tr>
<th></th>
<th>Local Authority</th>
<th>Other Jurisdiction Authority</th>
<th>State Mandated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity of Operations Plan</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Comment: In development, estimated date of completion- spring 2017</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Health Plan</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Comment: San Mateo County Health Department</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 13-2. FISCAL CAPABILITY

<table>
<thead>
<tr>
<th>Financial Resources</th>
<th>Accessible or Eligible to Use?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Development Block Grants</td>
<td>Yes</td>
</tr>
<tr>
<td>Capital Improvements Project Funding</td>
<td>Yes</td>
</tr>
<tr>
<td>Authority to Levy Taxes for Specific Purposes</td>
<td>No, Vote required</td>
</tr>
<tr>
<td>User Fees for Water, Sewer, Gas or Electric Service</td>
<td>Yes, Sewer</td>
</tr>
<tr>
<td>Incur Debt through General Obligation Bonds</td>
<td>No, Vote required</td>
</tr>
<tr>
<td>Incur Debt through Special Tax Bonds</td>
<td>Yes, If a bond revenue – Needs revenue stream</td>
</tr>
<tr>
<td>Incur Debt through Private Activity Bonds</td>
<td>Unknown</td>
</tr>
<tr>
<td>Withhold Public Expenditures in Hazard-Prone Areas</td>
<td>Yes</td>
</tr>
<tr>
<td>State-Sponsored Grant Programs</td>
<td>Yes</td>
</tr>
<tr>
<td>Development Impact Fees for Homebuyers or Developers</td>
<td>Yes, in accordance with restrictions applicable to use of the fee</td>
</tr>
<tr>
<td>Other</td>
<td>Yes, Other General Fund Revenue</td>
</tr>
</tbody>
</table>

### TABLE 13-3. ADMINISTRATIVE AND TECHNICAL CAPABILITY

<table>
<thead>
<tr>
<th>Staff/Personnel Resources</th>
<th>Available?</th>
<th>Department/Agency/Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planners or engineers with knowledge of land development and land management practices</td>
<td>Yes</td>
<td>Planning Dept: Director, Assoc. Planner, Asst. Planner (x2).</td>
</tr>
<tr>
<td>Engineers or professionals trained in building or infrastructure construction practices</td>
<td>Yes</td>
<td>Public Works Dept.: City Engineer, Assoc. Engineer (x2), Assist. Engineer</td>
</tr>
<tr>
<td>Planners or engineers with an understanding of natural hazards</td>
<td>Yes</td>
<td>Planning Dept: Director, Assoc. Planner, Asst. Planner (x2). Public Works Dept.: City Engineer, Assoc. Engineer (x2), Assist. Engineer</td>
</tr>
<tr>
<td>Staff with training in benefit/cost analysis Surveyors</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Staff capable of making substantial damage estimates</td>
<td>Yes</td>
<td>Contract support- CSG Consultants</td>
</tr>
<tr>
<td>Personnel skilled or trained in GIS applications</td>
<td>No</td>
<td>Planning Dept.: Assoc. Planner</td>
</tr>
<tr>
<td>Scientist familiar with natural hazards in local area</td>
<td>Yes</td>
<td>Contract support- CSG Consultants</td>
</tr>
<tr>
<td>Emergency manager</td>
<td>Yes</td>
<td>Pacifica Police Department Captain</td>
</tr>
</tbody>
</table>
### TABLE 13-3. ADMINISTRATIVE AND TECHNICAL CAPABILITY

<table>
<thead>
<tr>
<th>Staff/Personnel Resources</th>
<th>Available?</th>
<th>Department/Agency/Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant writers</td>
<td>Yes</td>
<td>No position in the city is wholly dedicated to grant writing. Available personnel have written grants in the past from the following departments and divisions: Planning, Police and Public Works</td>
</tr>
</tbody>
</table>

### TABLE 13-4. NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>When did the community enter the NFIP?</td>
<td>Feb 4, 1981</td>
</tr>
<tr>
<td>When did the Flood Insurance Rate maps become effective?</td>
<td>October 16, 2012</td>
</tr>
<tr>
<td>What local department is responsible for floodplain management?</td>
<td>Planning Department</td>
</tr>
<tr>
<td>Who is your floodplain administrator? (department/position)</td>
<td>Planning Dept.: Building Official (Contracted)</td>
</tr>
<tr>
<td>Is this a primary or auxiliary role?</td>
<td>Auxiliary</td>
</tr>
<tr>
<td>Are any certified floodplain managers on staff in your jurisdiction?</td>
<td>No</td>
</tr>
<tr>
<td>What is the date of adoption of your flood damage prevention ordinance?</td>
<td>7-27-1988</td>
</tr>
<tr>
<td>Does your floodplain management program meet or exceed minimum requirements?</td>
<td>Meet</td>
</tr>
<tr>
<td>If so, in what ways?</td>
<td>N/A</td>
</tr>
<tr>
<td>When was the most recent Community Assistance Visit or Community Assistance Contact?</td>
<td>4-29-2010</td>
</tr>
<tr>
<td>Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed?</td>
<td>No</td>
</tr>
<tr>
<td>Do your flood hazard maps adequately address the flood risk within your jurisdiction?</td>
<td>Yes</td>
</tr>
<tr>
<td>Does your floodplain management staff need any assistance or training to support its floodplain management program?</td>
<td>No</td>
</tr>
<tr>
<td>Does your jurisdiction participate in the Community Rating System (CRS)?</td>
<td>Yes</td>
</tr>
<tr>
<td>If so, is your jurisdiction seeking to improve its CRS Classification?</td>
<td>No</td>
</tr>
<tr>
<td>How many Flood Insurance policies are in force in your jurisdiction?</td>
<td>398</td>
</tr>
<tr>
<td>What is the insurance in force?</td>
<td>$112,489,900</td>
</tr>
<tr>
<td>What is the premium in force?</td>
<td>$293,319</td>
</tr>
<tr>
<td>How many total loss claims have been filed in your jurisdiction?</td>
<td>111</td>
</tr>
<tr>
<td>How many claims were closed without payment/are still open?</td>
<td>39 (1 open, 38 CWOP)</td>
</tr>
<tr>
<td>What were the total payments for losses?</td>
<td>$756,406</td>
</tr>
</tbody>
</table>
### Table 13-5. Community Classifications

<table>
<thead>
<tr>
<th>Classification</th>
<th>Participating?</th>
<th>Date Classified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Rating System</td>
<td>Yes</td>
<td>7</td>
</tr>
<tr>
<td>Building Code Effectiveness Grading Schedule</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Public Protection</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Storm Ready</td>
<td>Yes</td>
<td>Tsunami Ready</td>
</tr>
<tr>
<td>Firewise</td>
<td>No</td>
<td>1-15-14</td>
</tr>
</tbody>
</table>

### Table 13-6. Education and Outreach

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you have a Public Information Officer or Communications Office?</td>
<td>Yes, Police Administrative Captain</td>
</tr>
<tr>
<td>Do you have personnel skilled or trained in website development?</td>
<td>Yes, Pacifica MIS Division</td>
</tr>
<tr>
<td>Do you have hazard mitigation information available on your website?</td>
<td>Yes</td>
</tr>
<tr>
<td>• If yes, please briefly describe.</td>
<td>A winter storm preparedness page, and Emergency Preparedness and Safety Commission links to relevant outside sites</td>
</tr>
<tr>
<td>Do you utilize social media for hazard mitigation education and outreach?</td>
<td>Yes</td>
</tr>
<tr>
<td>• If yes, please briefly describe.</td>
<td>Facebook, Next Door, Twitter, and the countywide SMC Alert system refer people to information on the city’s website</td>
</tr>
<tr>
<td>Do you have any citizen boards or commissions that address issues related to hazard mitigation?</td>
<td>Yes</td>
</tr>
<tr>
<td>• If yes, please specify.</td>
<td>The Emergency Preparedness and Safety Commission meets once a month and has a page on the City’s website</td>
</tr>
<tr>
<td>Do you have any other programs already in place that could be used to communicate hazard-related information?</td>
<td>Yes</td>
</tr>
<tr>
<td>• If yes, please briefly describe.</td>
<td>SMC Alert (by Everbridge) is a mass notification system using text and phone.</td>
</tr>
<tr>
<td>Do you have any established warning systems for hazard events?</td>
<td>Yes</td>
</tr>
<tr>
<td>• If yes, please briefly describe.</td>
<td>The city has three warning sirens along the coast. The sirens also have voice capability.</td>
</tr>
</tbody>
</table>

### 13.4 Integration with Other Planning Initiatives

The following describe the jurisdiction’s process for integrating the hazard mitigation plan into local planning mechanisms.
1.1.1 Existing Integration

The following plans and programs currently integrate the goals, risk assessment and/or recommendations of the hazard mitigation plan:

- Public Outreach: The City’s public outreach on disaster preparedness incorporates prevention, preparedness, and mitigation recommendations, especially on the Natural Disasters section of the website. The Natural Disasters section of the website includes information on earthquakes, flooding, winter storms, landslides, and tsunamis, all of which are profiled in the LHMP.

- General Plan: The Safety Element of the General Plan incorporates direct references to the LHMP. Additionally, it integrates information on pertinent local natural hazards, especially in the Safety Element. The Safety Element includes information on seismic and geologic hazards, flooding and drainage concerns, hazardous materials, and fire hazards.

1.1.2 Opportunities for Future Integration

The following plans and programs do not currently integrate the goals, risk assessment and/or recommendations of the hazard mitigation plan, but provide an opportunity for future integration:

- General Plan: The City is undertaking an overall General Plan Update process that will incorporate references to the Local Hazard Mitigation Plan.
- As an action item, the City intends to update to the flood damage prevention ordinance as a future integration opportunity.
- The City of Pacifica is participating in a sea level rise vulnerability assessment. The Assessment is part of a long-term resilience strategy to ensure our community, ecosystems, and economy are prepared for climate change. The effort is being conducted through a collaborative, multi-stakeholder effort.

13.5 Jurisdiction-Specific Natural Hazard Event History

Table 13-6 lists all past occurrences of natural hazards within the jurisdiction.

<table>
<thead>
<tr>
<th>Type of Event</th>
<th>FEMA Disaster # (if applicable)</th>
<th>Date</th>
<th>Preliminary Damage Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Weather</td>
<td>tbd</td>
<td>Jan 2016</td>
<td>$3.4mil - Moderate flooding, coastal erosion due to increased tidal action, power outages and debris from trees and sand along the coastline</td>
</tr>
<tr>
<td>Wildfire</td>
<td>n/a</td>
<td>Jan 2015</td>
<td>Approx. 2.5 acres of trees and brush burned</td>
</tr>
<tr>
<td>Severe Weather</td>
<td>n/a</td>
<td>Dec 14, 2014</td>
<td>$280,000 - Major flooding, power outages and debris from trees and sand along the coastline</td>
</tr>
<tr>
<td>Type of Event</td>
<td>FEMA Disaster # (if applicable)</td>
<td>Date</td>
<td>Preliminary Damage Assessment</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>---------------------------------</td>
<td>--------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Tsunami</td>
<td>n/a</td>
<td>Mar 11, 2011</td>
<td>Warning – no subsequent event, 8.9 earthquake in Japan caused Tsunami warning to West Coast of California</td>
</tr>
<tr>
<td>Severe Weather (Coastal Erosion)</td>
<td>CDAA-2010-04</td>
<td>Mar 2009</td>
<td>Severe coastal erosion prompting red-tagging of adjacent homes and apartments</td>
</tr>
<tr>
<td>Severe Weather</td>
<td>1646</td>
<td>Mar 29, 2005- April 16, 2006</td>
<td>Moderate flooding, coastal erosion due to increased tidal action, power outages and debris from trees and sand along the coastline</td>
</tr>
<tr>
<td>Severe Weather</td>
<td>1628</td>
<td>Dec 17, 2005- Jan 3, 2006</td>
<td>Moderate flooding, coastal erosion due to increased tidal action, power outages and debris from trees and sand along the coastline</td>
</tr>
<tr>
<td>Landslide</td>
<td>n/a</td>
<td>1997</td>
<td>Mudslide in the Pedro Point area of Pacifica washed out a road</td>
</tr>
<tr>
<td>Severe Weather (coastal erosion)</td>
<td>N/A</td>
<td>1997-1998</td>
<td>Seven homes on Esplanade Avenue lost the last 10 feet of their back yards and residents had to evacuate.</td>
</tr>
<tr>
<td>Severe Weather, Flood</td>
<td>n/a</td>
<td>January 4, 1983</td>
<td>On Jan. 4, 1983, more than 5 inches of rain fell in one day. Residents in canoes paddled out of flooded homes in the San Pedro Valley. A mudslide at the top of the valley plowed into three homes, killing three children sleeping in their beds.</td>
</tr>
</tbody>
</table>

### 13.6 Jurisdiction-Specific Vulnerabilities

Repetitive loss records are as follows:

- Number of FEMA-identified Repetitive-Loss Properties: 0
- Number of FEMA-identified Severe-Repetitive-Loss Properties: 0
- Number of Repetitive-Loss Properties or Severe-Repetitive-Loss Properties that have been mitigated: 0

Other noted vulnerabilities include:

- Western Linda Mar area flooding (urban drainage flooding)
- Coastal erosion, Rockaway Beach Avenue, north to city limits
Transportation isolation/Accessibility (arterial, bridges over highway, single-entry neighborhoods) Highway One (California State Route 1) is the major road that connects the city’s neighborhoods and allows for traffic in and out of the city. In the very south, Pacifica is connected to the next community via a bridge and a tunnel. In the very north, Pacifica is connected to the City of San Francisco by Interstate 280 (I-280). The other access into or out of Pacifica is Sharp Park Road (that connects with California State Route 35 (CA-35). There are areas of Highway One which may be susceptible to landslides due to the steep grade. There have been some minor rock slides in the area. If areas of Highway One were blocked due to a landslide, the City may be severely limited to access equipment, parts, and materials to fix infrastructure.

13.7 Hazard Risk Ranking

Table 13-7 presents the ranking of the hazards of concern.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Hazard Type</th>
<th>Risk Rating Score (Probability x Impact)</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Earthquake</td>
<td>48</td>
<td>High</td>
</tr>
<tr>
<td>2</td>
<td>Severe Weather</td>
<td>33</td>
<td>Medium</td>
</tr>
<tr>
<td>3</td>
<td>Flood</td>
<td>30</td>
<td>Medium*</td>
</tr>
<tr>
<td>4</td>
<td>Landslide</td>
<td>28</td>
<td>Medium*</td>
</tr>
<tr>
<td>5</td>
<td>Tsunami</td>
<td>22</td>
<td>Medium</td>
</tr>
<tr>
<td>6</td>
<td>Wildfire</td>
<td>18</td>
<td>Medium</td>
</tr>
<tr>
<td>7</td>
<td>Drought</td>
<td>3</td>
<td>Low</td>
</tr>
<tr>
<td>8</td>
<td>Dam Failure</td>
<td>0</td>
<td>None</td>
</tr>
</tbody>
</table>

*The Risk Ranking Score for two hazard types were increased using subjective assessments. Flood was raised from 18 to 30 due to the fact that two of the locations in Pacifica that are most prone to flooding are in the Pacific Coastal Zone, encompass a major transportation artery and a state highway which is the City’s primary transportation artery, and affect two large shopping centers which account for a sizeable percentage of tax revenue and supplies (grocery and pharmacy). Landslide was also increased from 24 to 28. Landslide risk is brought about not only by Severe Weather, but by routine everyday wave action which affects the coastal bluffs. Landslide risk affects residential and business districts in the Pacific Coastal Zone, a major transportation artery into/out of the City, and the state highway which is the City’s main transportation route.

13.8 Hazard Mitigation Action Plan and Evaluation of Recommended Actions

Table 13-8 lists the actions that make up the City of Pacifica hazard mitigation action plan. Table 13-9 identifies the priority for each action. Table 13-10 summarizes the mitigation actions by hazard of concern and the six mitigation types.
<table>
<thead>
<tr>
<th>Applies to new or existing assets</th>
<th>Hazards Mitigated</th>
<th>Objectives Met</th>
<th>Lead Agency</th>
<th>Estimated Cost</th>
<th>Sources of Funding</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA-1— Pacifica will build infrastructure to accommodate increases in low impact flooding to mitigate impacts from expected increases in incidents of shallow flooding.</td>
<td>Flooding, Severe Weather</td>
<td>1, 6, 7</td>
<td>Engineering, Public Works</td>
<td>Medium</td>
<td>Planned local drainage fund</td>
<td>Medium term</td>
</tr>
<tr>
<td>PA-2— Pacifica will be conducting an update of its Emergency Operations Plan to ensure an effective and coordinated response to disasters within the city.</td>
<td>All Hazards</td>
<td>1, 2, 3, 6, 8, 10</td>
<td>Police Department</td>
<td>Low</td>
<td>Staff time, General fund</td>
<td>Short term</td>
</tr>
<tr>
<td>PA-3— Pacifica will update its flood damage prevention ordinance to mitigate against damage of residential and commercial property in flood prone areas.</td>
<td>Flood, Severe Weather</td>
<td>1, 2, 3, 4, 7, 8, 10</td>
<td>Planning Department</td>
<td>Low</td>
<td>Staff time, General fund</td>
<td>Short term</td>
</tr>
<tr>
<td>PA-4— Pacifica seek to encourage and assist in the acquisition of grants for the purchase or relocation of property and structures in high hazard areas to mitigate against damage to vulnerable structures and infrastructure.</td>
<td>Flood, Landslide</td>
<td>1, 2, 3</td>
<td>Engineering, Public Works</td>
<td>High</td>
<td>HMGP Grant</td>
<td>Short term</td>
</tr>
<tr>
<td>PA-5— Pacifica will pursue opportunities to preserve and protect critical transportation infrastructure to mitigate against isolation, economic loss and ensure public safety.</td>
<td>Earthquake, Flood, Landslide, Severe Weather, Tsunami, Wildfire</td>
<td>1, 2, 4, 5, 6, 8</td>
<td>Engineering, Public Works</td>
<td>High</td>
<td>HMGP, PDM Grant, bonds, General fund</td>
<td>Medium term</td>
</tr>
<tr>
<td>PA-6— Pacifica will seek to replace/upgrade its seismically-vulnerable facilities to ensure provision of vital services following a hazard event.</td>
<td>Earthquake</td>
<td>1, 3, 4, 5, 6, 7</td>
<td>Engineering, Public Works</td>
<td>High</td>
<td>HMGP, PDM Grant, bonds, General fund</td>
<td>Long term</td>
</tr>
<tr>
<td>PA-7— Pacifica will preserve, protect, or relocate hazard prone infrastructure to maintain critical services and maintain the environment.</td>
<td>Earthquake, Flood Landslide, Tsunami</td>
<td>1, 4, 5, 6</td>
<td>Engineering, Public Works</td>
<td>High</td>
<td>HMGP Grant, bonds, General fund</td>
<td>Medium term</td>
</tr>
<tr>
<td>PA-8— Pacifica will develop and deliver business outreach programs to mitigate against the functional loss of community businesses and promote business resiliency.</td>
<td>Severe Weather, Earthquake, Flood, Wildfire, Landslide, Tsunami</td>
<td>1, 2, 3, 9, 10</td>
<td>Police Department/Emergency Management</td>
<td>Low</td>
<td>Staff time</td>
<td>Short term</td>
</tr>
<tr>
<td>PA-9— Pacifica will work with contiguous and neighboring utility districts to develop its use of recycled water for irrigation and non-potable uses to reduce reliance on potable water during periods of drought.</td>
<td>Drought</td>
<td>3, 4, 5, 6, 8</td>
<td>Public Works, Waste Water</td>
<td>Medium</td>
<td>General fund, Staff time</td>
<td>Medium term</td>
</tr>
</tbody>
</table>
### Table 13-8. Hazard Mitigation Action Plan Matrix

<table>
<thead>
<tr>
<th>Applies to new or existing assets</th>
<th>Hazards Mitigated</th>
<th>Objectives Met</th>
<th>Lead Agency</th>
<th>Estimated Cost</th>
<th>Sources of Funding</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PA-10</strong>—Pacifica will continue to do public education outreach to our neighborhoods using the “Map Your Neighborhood” tool to ensure communities can take care of themselves and those who live around them during a disaster event.</td>
<td>All Hazards</td>
<td>1, 2, 3, 4, 6, 7, 9, 10</td>
<td>Police Department/ Emergency Management</td>
<td>Low</td>
<td>Staff time, General fund</td>
<td>Long term</td>
</tr>
<tr>
<td><strong>Action G-1</strong>—Where appropriate, support retrofitting, purchase, or relocation of structures in hazard-prone areas to prevent future structure damage. Give priority to properties with exposure to repetitive losses.</td>
<td>All</td>
<td>1, 3, 4, 5, 6, 7, 11</td>
<td>Jurisdictions</td>
<td>High</td>
<td>FEMA Hazard Mitigation Grants</td>
<td>Long-term (depending on funding)</td>
</tr>
<tr>
<td><strong>Action G-2</strong>—Consider participation in incentive-based programs such as the Community Rating System, Tree City, and StormReady.</td>
<td>All</td>
<td>All</td>
<td>Jurisdictions</td>
<td>Low</td>
<td>General Fund</td>
<td>Long-term</td>
</tr>
<tr>
<td><strong>Action G-3</strong>—Maintain good standing under the National Flood Insurance Program by implementing programs that meet or exceed the minimum NFIP requirements. Such programs include enforcing an adopted flood damage prevention ordinance, participating in floodplain mapping updates, and providing public assistance and information on floodplain requirements and impacts.</td>
<td>Flooding</td>
<td>2, 3, 5, 6, 8</td>
<td>San Mateo County Unincorporated and Municipalities with SFHAs</td>
<td>Low</td>
<td>General Fund</td>
<td>Short-term and ongoing</td>
</tr>
<tr>
<td><strong>Action G-4</strong>—Where feasible, implement a program to record high water marks following high-water events.</td>
<td>Flooding, Severe Weather</td>
<td>1, 3, 4, 5, 6</td>
<td>Jurisdictions</td>
<td>Medium</td>
<td>General Fund; FEMA Grant Funds (Public Assistance)</td>
<td>Long-term</td>
</tr>
<tr>
<td><strong>Action G-5</strong>—Integrate the hazard mitigation plan into other plans, programs, or resources that dictate land use or redevelopment.</td>
<td>All</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 10</td>
<td>Jurisdictions</td>
<td>Low</td>
<td>General Fund</td>
<td>Short-term</td>
</tr>
<tr>
<td><strong>Action G-6</strong>—Provide incentives for eligible non-profits and private entities, including homeowners, to adapt to risks through structural and nonstructural retrofitting.</td>
<td>All</td>
<td>2, 3, 4, 5, 6, 7, 8, 10, 11</td>
<td>Jurisdictions</td>
<td>Low</td>
<td>Operating Budgets</td>
<td>Ongoing</td>
</tr>
<tr>
<td><strong>Action G-7</strong>—Support the County-wide initiatives identified in Volume I of the hazard mitigation plan.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 13-8. HAZARD MITIGATION ACTION PLAN MATRIX

<table>
<thead>
<tr>
<th>Applies to new or existing assets</th>
<th>Hazards Mitigated</th>
<th>Objectives Met</th>
<th>Lead Agency</th>
<th>Estimated Cost</th>
<th>Sources of Funding</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>New and existing</td>
<td>All</td>
<td>All</td>
<td>Jurisdictions</td>
<td>Low</td>
<td>General Fund</td>
<td>Short- and long-term</td>
</tr>
</tbody>
</table>

**Action G-8**— Actively participate in the plan maintenance protocols outlined in Volume I of the hazard mitigation plan.

New and Existing | All | 1, 4 | Jurisdictions | Low | Staff Time, General Funds | Short-term |

### TABLE 13-9. MITIGATION STRATEGY PRIORITY SCHEDULE

<table>
<thead>
<tr>
<th>Action #</th>
<th># of Objectives Met</th>
<th>Benefits</th>
<th>Costs</th>
<th>Do Benefits Equal or Exceed Costs?</th>
<th>Is Project Grant-Eligible?</th>
<th>Can Project Be Funded Under Existing Programs/Budgets?</th>
<th>Implementation Prioritya</th>
<th>Grant Prioritya</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA-1</td>
<td>3</td>
<td>High</td>
<td>Medium</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>PA-2</td>
<td>6</td>
<td>Medium</td>
<td>Low</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>PA-3</td>
<td>7</td>
<td>Medium</td>
<td>Low</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>PA-4</td>
<td>3</td>
<td>High</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>PA-5</td>
<td>6</td>
<td>High</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>PA-6</td>
<td>6</td>
<td>High</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>PA-7</td>
<td>5</td>
<td>High</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>PA-8</td>
<td>5</td>
<td>Medium</td>
<td>Low</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>PA-9</td>
<td>5</td>
<td>Medium</td>
<td>Low</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>PA-10</td>
<td>8</td>
<td>High</td>
<td>Low</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>G-1</td>
<td>7</td>
<td>High</td>
<td>High</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>G-2</td>
<td>11</td>
<td>High</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>G-3</td>
<td>5</td>
<td>Medium</td>
<td>Low</td>
<td>No</td>
<td>Yes</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>G-4</td>
<td>5</td>
<td>Medium</td>
<td>Medium</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>G-5</td>
<td>9</td>
<td>Medium</td>
<td>Low</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>G-6</td>
<td>9</td>
<td>Low</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>G-7</td>
<td>11</td>
<td>Low</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>G-8</td>
<td>2</td>
<td>Low</td>
<td>Low</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

*a. See the introduction to this volume for explanation of priorities.*
TABLE 13-10. ANALYSIS OF MITIGATION ACTIONS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dam Failure</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Drought</td>
<td>PA-9, PA-10</td>
<td>-</td>
<td>PA-10</td>
<td>PA-9</td>
<td>PA-2</td>
<td>PA-9</td>
</tr>
<tr>
<td>Flood</td>
<td>PA-1, PA-2, PA-3, PA-5, PA-8, PA-10</td>
<td>PA-1, PA-3, PA-4</td>
<td>PA-2, PA-3, PA-8, PA-10</td>
<td>PA-7</td>
<td>PA-2, PA-7</td>
<td>PA-4, PA-7</td>
</tr>
<tr>
<td>Earthquake</td>
<td>PA-2, PA-5, PA-6, PA-7, PA-8, PA-10</td>
<td>PA-6, PA-7, PA-8</td>
<td>PA-2, PA-8, PA-10</td>
<td>PA-7</td>
<td>PA-2, PA-7</td>
<td>PA-5, PA-6, PA-7</td>
</tr>
<tr>
<td>Landslide</td>
<td>PA-2, PA-4, PA-7, PA-8, PA-10</td>
<td>PA-5, PA-7, PA-8</td>
<td>PA-2, PA-8, PA-10</td>
<td>PA-7</td>
<td>PA-2, PA-7</td>
<td>PA-5, PA-7</td>
</tr>
<tr>
<td>Severe Weather</td>
<td>PA-1, PA-2, PA-3, PA-5, PA-7, PA-8, PA-10</td>
<td>PA-1, PA-3, PA-7, PA-8</td>
<td>PA-2, PA-8, PA-10</td>
<td>PA-7</td>
<td>PA-2, PA-7</td>
<td>PA-7</td>
</tr>
<tr>
<td>Tsunami</td>
<td>PA-2, PA-5, PA-8, PA-10</td>
<td>PA-5, PA-8</td>
<td>PA-2, PA-8, PA-10</td>
<td>PA-7</td>
<td>PA-2, PA-7</td>
<td>PA-5</td>
</tr>
<tr>
<td>Wildfire</td>
<td>PA-5, PA-10</td>
<td>-</td>
<td>PA-8, PA-10</td>
<td>-</td>
<td>PA-2</td>
<td>-</td>
</tr>
</tbody>
</table>

a. See the introduction to this volume for explanation of mitigation types.

13.9 Future Needs to Better Understand Risk/Vulnerability

The City will examine the feasibility of conducting a Facilities Study Plan, to include a Needs Assessment, looking at all city owned structures. The results of this study may have an impact on the City’s long range budgeting to bring all its facilities up to current seismic and energy efficiency standards.

Hazard scenarios should continue to be examined to determine cost effective ways to address the hazard if possible and make the community and its infrastructure more resilient. Future climate science and related regional weather events will cause potential revision of hazard mitigation strategies and their implementation.

13.10 Additional Comments

One of the hazards assessed and named in this 2016 annex does not have applicability to the City of Pacifica: dam failure. Pacifica is sufficiently far away and overland that a dam failure will not have any direct effect within the city limits. Although the effects will be substantial on the Bay side of San Mateo County, it is improbable that Pacifica would experience the effects, so that hazard is not addressed.
Pacifica experiences severe weather conditions nearly every winter. Those conditions routinely cause mild to moderate flooding, temporary power outages, and debris such as downed trees. A significant component of severe storms are the tidal conditions which have caused extreme costal erosion. Eroded areas have now encroached into residential and commercial districts causing the loss of use of those properties. Recently, several homes and apartment buildings have either been deemed uninhabitable due to conditions or they’ve been demolished.

The City of Pacifica will actively participate in the plan maintenance strategy identified in this plan.
SECTION 2 - Chapter 13
City of Pacifica
SECTION 2 - Chapter 13
City of Pacifica

PACIFICA

FEMA Flood Hazard Areas

- Floodway (100 yr)
- 1% Annual Chance Flood (100 yr)

Data Sources: San Mateo County, Esri, FEMA

Packet Pg. 217
I. HAZARD MITIGATION GRANT PROGRAM (HMGP)

What is the Hazard Mitigation Grant Program?

HMGP is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (the Stafford Act), Title 42, United States Code (U.S.C.) 5170c. The key purpose of HMGP is to provide the opportunity to take critical mitigation measures to reduce future loss of life and property during the reconstruction process following a disaster.

HMGP is available, when authorized under a Presidential major disaster declaration, in the Tribe or areas of the State requested by the Governor. The amount of HMGP funding available is based upon the estimated total Federal assistance provided by FEMA for disaster recovery under the Presidential major disaster declaration.

Who is eligible to apply?

Hazard Mitigation Grant Program funding is only available to applicants that reside within a Presidential declared disaster area. Eligible applicants are

- State and local governments
- Indian tribes or other tribal organizations
- Certain non-profit organizations

What types of projects can be funded by the HMGP?

HMGP funds may be used to fund projects that will reduce or eliminate the losses from future disasters. Projects must provide a long-term solution to a problem, for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood. In addition, a project’s potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. Examples of projects include, but are not limited to:

- Acquisition of real property for willing sellers and demolition or relocation of buildings to convert the property to open space use
- Retrofitting structures and facilities to minimize damages from high winds, earthquake, flood, wildfire, or other natural hazards
- Elevation of flood prone structures
- Safe room construction
- Development and initial implementation of vegetative management programs
- Minor flood control projects that do not duplicate the flood prevention activities of other Federal agencies
• Localized flood control projects, such as certain ring levees and floodwall systems, that are designed specifically to protect critical facilities
• Post-disaster building code related activities that support building code officials during the reconstruction process

What are the minimum project criteria?

There are five issues you must consider when determining the eligibility of a proposed project.
• Does your project conform to your State’s Hazard Mitigation Plan?
• Does your project provide a beneficial impact on the disaster area i.e. the State?
• Does your application meet the environmental requirements?
• Does your project solve a problem independently?
• Is your project cost-effective?

II. PRE-DISASTER MITIGATION GRANT PROGRAM (PDM)

What is the Pre-Disaster Mitigation competitive grant program?

The Pre-Disaster Mitigation (PDM) competitive grant program provides funds to State, Tribal, and local governments for pre-disaster mitigation planning and projects primarily addressing natural hazards. Cost-effective pre-disaster mitigation activities reduce risk to life and property from natural hazard events before a natural disaster strikes, thus reducing overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. Funds will be awarded on a competitive basis to successful applicants for mitigation planning and project applications intended to make local governments more resistant to the pacts of future natural disasters.

Who can apply for a PDM competitive grant?

Eligible PDM competitive grant applicants include state and territorial emergency management agencies, or a similar office of the State, District of Columbia, U.S. Virgin Islands, Commonwealth of Puerto Rico, Guam, American Samoa, Commonwealth of the Northern Mariana Islands, and Federally-recognized Indian Tribal governments.

✓ Eligible Sub-applicants include State agencies; Federally-recognized Indian Tribal governments; and local governments (including State recognized Indian Tribal governments and Alaska native villages).
✓ Applicants can apply for PDM competitive grant funds directly to FEMA, while Sub-applicants must apply for funds through an eligible Applicant.
✓ Private non-profit organizations are not eligible to apply for PDM but may ask the appropriate local government to submit an application for the proposed activity on their behalf.
What are eligible PDM projects?

Multi-hazard mitigation projects must primarily focus on natural hazards but also may address hazards caused by non-natural forces. **Funding is restricted to a maximum of $3M Federal share per project.** The following are eligible mitigation projects:

- Acquisition or relocation of hazard-prone property for conversion to open space in perpetuity;

- Structural and non-structural retrofitting of existing buildings and facilities (including designs and feasibility studies when included as part of the construction project) for wildfire, seismic, wind or flood hazards (e.g., elevation, flood proofing, storm shutters, hurricane clips);

- Minor structural hazard control or protection projects that may include vegetation management, Stormwater management (e.g., culverts, floodgates, retention basins), or shoreline/landslide stabilization; and,

- Localized flood control projects, such as certain ring levees and floodwall systems, that are designed specifically to protect critical facilities and that do not constitute a section of a larger flood control system.

**Mitigation Project Requirements**

Projects should be technically feasible (see Section XII. Engineering Feasibility) and ready to implement. Engineering designs for projects must be included in the application to allow FEMA to assess the effectiveness and feasibility of the proposed project. The project cost estimate should complement the engineering design, including all anticipated costs. FEMA has several formats that it uses in cost estimating for projects. Additionally, other Federal agencies’ approaches to project cost estimating can be used as long as the method provides for a complete and accurate estimate. FEMA can provide technical assistance on engineering documentation and cost estimation (see Section XIII.D. Engineering Feasibility).

Mitigation projects also must meet the following criteria:

1. Be cost-effective and substantially reduce the risk of future damage, hardship, loss, or suffering resulting from a major disaster, consistent with 44 CFR 206.434(c)(5) and related guidance, and have a Benefit-Cost Analysis that results in a benefit-cost ratio of 1.0 or greater (see Section X. Benefit-Cost Analysis). **Mitigation projects with a benefit-cost ratio less than 1.0 will not be considered for the PDM competitive grant program;**

2. Be in conformance with the current FEMA-approved State hazard mitigation plan;

3. Solve a problem independently or constitute a functional portion of a solution where there is assurance that the project as a whole will be completed, consistent with 44 CFR 206.434(b)(4);

5. Not duplicate benefits available from another source for the same purpose, including assistance that another Federal agency or program has the primary authority to provide (see Section VII.C. Duplication of Benefits and Programs);

6. Be located in a community that is participating in the NFIP if they have been identified through the NFIP as having a Special Flood Hazard Area (a FHBM or FIRM has been issued). In addition, the community must not be on probation, suspended or withdrawn from the NFIP; and,

7. Meet the requirements of Federal, State, and local laws.

What are examples of Ineligible PDM Projects?

The following mitigation projects are not eligible for the PDM program:

✓ Major flood control projects such as dikes, levees, floodwalls, seawalls, groins, jetties, dams, waterway channelization, beach nourishment or re-nourishment;
✓ Warning systems;
✓ Engineering designs that are not integral to a proposed project;
✓ Feasibility studies that are not integral to a proposed project;
✓ Drainage studies that are not integral to a proposed project;
✓ Generators that are not integral to a proposed project;
✓ Phased or partial projects;
✓ Flood studies or flood mapping; and,
✓ Response and communication equipment.
San Mateo County

HAZARD MITIGATION PLAN

July 2016

VOLUME 1

TETRA TECH
ACKNOWLEDGMENTS

Project Managers
- Bart Spencer, Emergency Services Coordinator, Central County Fire Department
- David Pucci, Deputy Chief, Redwood City Fire Department

Other Regional Project Staff
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- Bradley Hartzell, Fire Liaison, San Mateo County Office of Emergency Services – serving on the Planning Team and serving as the liaison with San Mateo OES.

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Steering Committee members included:
- David Pucci, Chair, Redwood City and formerly assigned to Office of Emergency Services
- Bart Spencer, Co-Chair, Emergency Service Coordinator, Central County Fire Department
- Joseph Spanheimer, Captain, Pacifica Police Department
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- Roberto Bartoli, Planner, County of San Mateo
- Thomas Maloney, Emergency Preparedness Contractor, San Mateo Community College District
- Daniel Berumen, Assistant Planner, City of East Palo Alto
- Bradley Hartzell, Fire Liaison, San Mateo County Office of Emergency Services
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<tbody>
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<td>°F</td>
<td>Degrees Fahrenheit</td>
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<tr>
<td>ABAG</td>
<td>Association of Bay Area Governments</td>
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<tr>
<td>BACERP</td>
<td>Bay Area Climate and Energy Resilience Project</td>
</tr>
<tr>
<td>ADA</td>
<td>Americans with Disabilities Act</td>
</tr>
<tr>
<td>ASPA</td>
<td>Aboveground petroleum storage tank</td>
</tr>
<tr>
<td>API</td>
<td>Advanced Persistent Threat</td>
</tr>
<tr>
<td>ATC</td>
<td>(Federal) Air Traffic Controller</td>
</tr>
<tr>
<td>BART</td>
<td>Bay Area Rapid Transit System</td>
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<tr>
<td>BPR</td>
<td>Bottom pressure recorder</td>
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<td>California Department of Forestry and Fire Protection</td>
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<tr>
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<td>Code of Federal Regulations</td>
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<td>Crime Prevention Through Environmental Design</td>
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<td>CRS</td>
<td>Community Rating System</td>
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<td>CSA</td>
<td>County Service Area</td>
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CWA
Clean Water Act

CZM
Coastal Zone Management

DART
Deep ocean Assessment and Reporting of Tsunamis

DEM
Digital Elevation Model

DFIRM
Digital Flood Insurance Rate Map

DMA
Disaster Mitigation Act

DOF
Department of Finance

DODS
Division of Dam Safety

DRIP
Drought Implementation Plan

DWR
Department of Water Resources

EA
Electronic Attack

EDD
Employment Development Department

EMA
Emergency Managers Association

EMP
Electromagnetic Pulse

EOP
Emergency operations plan

EPA
U.S. Environmental Protection Agency (also USEPA)

EPCRA
Emergency Planning and Community Right to Know Act

ESA
Endangered Species Act

FAA
Federal Aviation Administration

FBI
Federal Bureau of Investigation

FEMA
Federal Emergency Management Agency

FMA
Flood Mitigation Insurance

FHSZ
Fire Hazard Severity Zone

FRA
Federal responsibility area

FRAP
Fire and Resource Assessment
<table>
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<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>g</td>
<td>Gravity (%g, percent acceleration force of gravity)</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic information system</td>
</tr>
<tr>
<td>gpcd</td>
<td>Gallons per capita per day</td>
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<tr>
<td>HAZUS-MH</td>
<td>Hazards U.S.-Multi-Hazard</td>
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<tr>
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<td>Hazard Mitigation Grant Program</td>
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<td>HMP</td>
<td>Hazard Mitigation Plan</td>
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<tr>
<td>IBC</td>
<td>International Building Code</td>
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<td>IPCC</td>
<td>Intergovernmental Panel on Climate Change</td>
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<td>Insurance Services Office</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>LEPC</td>
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<td>LiMWAN</td>
<td>Limit of Moderate Wave Action</td>
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<td>Local responsibility area</td>
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<td>m</td>
<td>Meter</td>
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<td>Maximum credible earthquake</td>
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<td>Mass casualty incident</td>
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<td>MITM</td>
<td>Man in the middle</td>
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<tr>
<td>mm</td>
<td>Millimeter</td>
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<tr>
<td>MM</td>
<td>Modified Mercalli</td>
</tr>
<tr>
<td>mm/yr</td>
<td>Millimeters per year</td>
</tr>
<tr>
<td>mph</td>
<td>Miles per hour</td>
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<td>mrp</td>
<td>Mean return period</td>
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<tr>
<td>NASA</td>
<td>National Aeronautics and Space Administration</td>
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<td>NCDC</td>
<td>National Climatic Data Center</td>
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<tr>
<td>NCRIC</td>
<td>Northern California Regional Intelligence Center</td>
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<tr>
<td>NDSP</td>
<td>National Dam Safety Program</td>
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<tr>
<td>NEHRP</td>
<td>National Earthquake Hazard Reduction Program</td>
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<tr>
<td>NFIP</td>
<td>National Flood Insurance Program</td>
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<tr>
<td>NFPA</td>
<td>National Fire Protection Academy</td>
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<tr>
<td>NLD</td>
<td>National Levee Database</td>
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<tr>
<td>NMDC</td>
<td>National Drought Mitigation Center</td>
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<tr>
<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration</td>
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<tr>
<td>NTSC</td>
<td>National Transportation Safety Board</td>
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<td>NWS</td>
<td>National Weather Service</td>
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<tr>
<td>ONI</td>
<td>Ocean Niño Index</td>
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<tr>
<td>PCB</td>
<td>Polychlorinated biphenyls</td>
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<tr>
<td>PDM</td>
<td>Pre-disaster Mitigation Grant Program or Pre-disaster Mitigation</td>
</tr>
<tr>
<td>PDSI</td>
<td>Palmer Drought Severity Index</td>
</tr>
<tr>
<td>PGA</td>
<td>Peak Ground Acceleration</td>
</tr>
<tr>
<td>PG&amp;E</td>
<td>Pacific Gas and Electric</td>
</tr>
<tr>
<td>ppm</td>
<td>Part per million</td>
</tr>
<tr>
<td>PTWC</td>
<td>Pacific Tsunami Warning Center</td>
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<tr>
<td>RCRA</td>
<td>Resource Conservation and Recovery Act</td>
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<td>RCRA Info</td>
<td>RCRA Information</td>
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<tr>
<td>SB 37</td>
<td>Senate Bill 379</td>
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<tr>
<td>SCA</td>
<td>(Bay Area Water) Supply Conservation Agency</td>
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<tr>
<td>SCADA</td>
<td>Supervisory Control and Data Acquisition</td>
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<table>
<thead>
<tr>
<th>Acronym</th>
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<tbody>
<tr>
<td>SEMS</td>
<td>Standardized Emergency Management System</td>
</tr>
<tr>
<td>SERC</td>
<td>State Emergency Response Commission</td>
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<tr>
<td>SFO</td>
<td>San Francisco International Airport</td>
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<tr>
<td>SFPUC</td>
<td>San Francisco Public Utilities Commission</td>
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<tr>
<td>SMSO</td>
<td>San Mateo County Sherri’s Office</td>
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<td>SPCC</td>
<td>Spill Prevention Control and Countermeasures</td>
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<tr>
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<td>State responsibility area</td>
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<tr>
<td>TSCA</td>
<td>Toxic Substances Control Act</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>URM</td>
<td>Unreinforced Masonry</td>
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<tr>
<td>USACE</td>
<td>U.S. Army Corps of Engineers</td>
</tr>
<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
</tr>
<tr>
<td>USEPA</td>
<td>U.S. Environmental Protection Agency (also EPA)</td>
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<tr>
<td>USGS</td>
<td>U.S. Geological Survey</td>
</tr>
<tr>
<td>UST</td>
<td>Underground storage tank</td>
</tr>
<tr>
<td>VHFHSZ</td>
<td>Very High Fire Hazard Severity Zone</td>
</tr>
<tr>
<td>WC/ATWC</td>
<td>West Coast and Alaskan Tsunami Warning Center</td>
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<tr>
<td>WMD</td>
<td>Weapons of Mass Destruction</td>
</tr>
<tr>
<td>WUI</td>
<td>Wildland Urban Interface</td>
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EXECUTIVE SUMMARY
Executive Summary

Hazard mitigation is the use of long-term and short-term policies, programs, projects, and other activities to alleviate the death, injury, and property damage that can result from a disaster. San Mateo County has developed and maintained a multi-hazard mitigation plan (HMP) to reduce risks from natural disasters. The plan complies with requirements for hazard mitigation planning to maintain eligibility for funding under Federal Emergency Management Agency (FEMA) grant programs.

Previous Hazard Mitigation Planning In San Mateo County

Federal regulations require hazard mitigation plans to include a strategy for monitoring, evaluating, and updating the hazard mitigation plan. An update provides an opportunity to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. Disaster Mitigation Act of 2000 (DMA) compliance is contingent on meeting the plan update requirement. A jurisdiction covered by a plan that has expired is not able to pursue funding under the Robert T. Stafford Act, which requires a current hazard mitigation plan as a prerequisite.

Initial Response to DMA in San Mateo County

The Association of Bay Area Governments (ABAG) provides planning and research resources related to land use, housing, environmental and water resource protection, disaster resilience, energy efficiency, hazardous waste mitigation, risk management, financial services, and staff training to local cities, and towns.

In 2004, ABAG led a regional effort to address hazard mitigation planning for jurisdictions within its area of responsibility. This regional template was used by numerous counties and cities within the ABAG planning area to achieve initial compliance under the DMA. The ABAG process equipped local governments with tools to complete individual planning processes that met their needs, while pooling resources and eliminating redundant planning efforts. In 2010, ABAG conducted its second regional planning effort. During the 2010 update, 17 local governments in San Mateo County used the ABAG tools to achieve DMA compliance.

The San Mateo County Planning Effort

In 2015, the San Mateo County Office of Emergency Services (OES) and San Mateo County jurisdictions have teamed together to prepare an updated countywide hazard mitigation plan that would best suit the needs and capabilities of the County and its planning partners. With these factors in mind, San Mateo County committed to preparation of its 2016 plan by securing technical assistance to facilitate a planning process that would comply with all program requirements. The ensuing planning process developed a new plan for the County and its planning partners from scratch, using lessons learned from the prior planning effort. While this plan is an update for many of the planning partners, it is the initial plan for others. The updated plan differs from the initial plan for a variety of reasons:

- The plan has been totally re-structured as a countywide regional plan, focusing only on the geographic region of San Mateo County. The risk assessment is not a subset of a larger regional or
multi-county effort. Instead, it is isolated to San Mateo County and focuses on hazards of concern for the County and local jurisdictions.

- The plan was expanded to include special districts as planning partners.
- The risk assessment has been formatted to best support future grant applications by providing information on risk and vulnerability that will directly support measurement of “cost-effectiveness” required under FEMA mitigation grant programs.
- Newly available data and tools provide for a more detailed and accurate risk assessment through means such as FEMA’s Hazards U.S. Multi-Hazard (HAZUS-MH) computer model or data such as FEMA’s countywide Digital Flood Insurance Rate Maps (DFIRMs).
- The update gave the County and its planning partners an opportunity to engage local citizens and gauge their perception of risk and support for risk reduction through mitigation.

**Plan Update Process**

The plan update was carried out in the following phases:

- **Phase 1, Organize and Review**—A planning team was assembled for the plan update, consisting of the Steering Committee Chair and Co-Chair. The team conducted outreach to establish the planning partnership. A 10-member steering committee was assembled to oversee the plan update, consisting of County staff, citizens, and other stakeholders in the planning area. Coordination with other county, state, and federal agencies involved in hazard mitigation occurred throughout the plan update process. This phase included a review of the existing HMP, the California State Hazard Mitigation Plan, and existing programs that may support hazard mitigation actions.

- **Phase 2, Update the Risk Assessment**—Risk assessment is the process of measuring the potential loss of life as well as personal injury, economic injury, and property damage resulting from natural hazards. This process assesses the vulnerability of people, buildings, and infrastructure to natural hazards. Risk assessment models were enhanced with new data and technologies that have become available since 2010. The risk assessment included the following:
  - Hazard identification and profiling
  - Assessment of the impact of hazards on physical, social, and economic assets
  - Vulnerability identification
  - Estimates of the cost of potential damage.

  The Steering Committee used the risk assessment to rank risk and to gauge the potential impacts of each hazard of concern in the San Mateo County planning area.

- **Phase 3, Engage the Public**—The planning team implemented a public involvement strategy developed by the Steering Committee. The strategy included public meetings to present the risk assessment and the draft plan, a hazard mitigation survey, a County-sponsored website, and multiple media releases.

- **Phase 4, Assemble the Updated Plan**—The planning team and Steering Committee assembled a document to meet federal hazard mitigation planning requirements. A completed local mitigation
plan review crosswalk has been included in Appendix F of this volume. This completed crosswalk provides a comparative analysis between the content in the San Mateo County HMP and the federal hazard mitigation planning requirements.

Phase 5, Plan Adoption/Implementation — The final adoption phase will begin once the State of California Governor’s Office of Emergency Services and FEMA Region IX have granted pre-adooption approval. The plan maintenance process includes a schedule for monitoring and evaluating the plan’s progress periodically and producing a revised plan every 5 years. This plan maintenance strategy also includes processes for continuing public involvement and integrating with other programs that can support or enhance hazard mitigation.

Risk Assessment Results
Based on the risk assessment, hazards were ranked as follows for the level of risk they pose to the overall planning area.

1. Earthquake
2. Severe Weather
3. Wildfire
4. Flood
5. Landslide
6. Tsunami
7. Dam Failure
8. Drought

Mitigation Guiding Principle, Goals, and Objectives
The Steering Committee and the planning partnership established the following goals for the plan update:

1. Protect life and property;
2. Provide information to residents to better understand the hazards of the region and ways to reduce their personal vulnerability to those hazards;
3. Promote hazard mitigation as an integrated public policy and as a standard business practice;
4. Increase resilience of infrastructure and critical facilities;
5. Protect the environment;
6. Develop and implement mitigation strategies that use public funds in an efficient and cost-effective way; and,
7. Improve community emergency management capability.

The following objectives were identified that meet multiple goals, helping to establish priorities for recommended mitigation actions:

1. Improve understanding of the locations, potential impacts, and linkages among threats hazards, vulnerability, and measures needed to protect life safety and health.
2. Establish and maintain partnerships among all levels of government, the private sector, community groups, and institutions of higher learning that improve and implement methods to protect life and property.

3. Develop and provide updated information about threats, hazards, vulnerabilities, and mitigation strategies to state, regional, and local agencies, as well as private-sector groups.

4. Encourage incorporation of mitigation measures into repairs, major alterations, new development, and redevelopment practices, especially in areas subject to substantial risk.

5. Promote and implement hazard mitigation plans and projects that are consistent with state, regional, and local climate action and adaptation goals, policies, and programs.

6. Advance community resilience through preparation, adoption, and implementation of state, regional, and local multi-hazard mitigation plans and projects.

7. Encourage life and property protection measures for all communities and structures located in hazard areas.

8. Actively promote effective coordination of regional and local hazard mitigation planning and action among state agencies, cities, counties, special districts, tribal organizations, councils of governments, metropolitan planning organizations, and regional transportation associations to create resilient and sustainable communities.

9. Improve systems that provide warning and emergency communications.


11. Retrofit, purchase, or relocate structures in high hazard areas, especially those known to be repetitively damaged.

**Mitigation Actions**

Mitigation actions presented in this update are activities designed to reduce or eliminate losses resulting from natural hazards. The update process resulted in the identification of mitigation actions for implementation by a collective, regional effort, and by individual jurisdictions, as presented in Section 3 and Volume 2 of this plan.

**Implementation**

Full implementation of the recommendations of this plan will require time and resources. The measure of the plan’s success will be its ability to adapt to changing conditions. San Mateo County and key plan stakeholders will assume responsibility for adopting the recommendations of this plan and committing resources toward implementation. The framework established by this plan commits San Mateo County and key plan stakeholders to pursue initiatives when the benefits of a project exceed its costs. San Mateo County and key plan stakeholders developed this plan with extensive public input, and public support of the actions identified in this plan will help ensure its success.
SECTION 1:
PLANNING PROCESS AND COMMUNITY PROFILE
Chapter 1.
Introduction to Hazard Mitigation Planning

1.1 The Big Picture

Hazard mitigation is defined as a method to reduce or alleviate the loss of life as well as personal injury, and property damage that can result from a disaster through long- and short-term strategies. Strategies include implementing planning approaches, policy changes, programs, projects, and other activities that can mitigate the impacts of hazards. The responsibility for hazard mitigation lies with many, including private property owners; business and industry stakeholders; and local, state, and federal government agencies.

The federal Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390) requires state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. Before 2000, federal disaster funding focused on disaster relief and recovery, with only limited funding for hazard mitigation planning. The DMA increased the emphasis on planning for disasters before they occur.

DMA encourages state and local authorities to work together on pre-disaster planning and promotes sustainability for disaster resistance. “Sustainable hazard mitigation” includes sound management of natural resources and the recognition that hazards and mitigation must be understood in the largest possible social and economic context. The enhanced planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk reduction projects.

1.2 Local Concerns

Natural and human-caused hazards affect citizens, property, the environment, and the economy of San Mateo County. Climate change, drought, earthquakes, floods, landslides, severe weather, tsunamis, wildfires, and dam failures have exposed San Mateo County residents and businesses to the financial and emotional costs of recovering after natural disasters. Additionally, human-caused hazards such as hazardous material releases, pipeline and tank leaks, terrorism, airline incidents, and cyber threats have the potential to further affect the county. The risk associated with both natural and human-caused hazards increases as more people move to or visit areas affected by those hazards.

The inevitability of hazards and the growing population and activity within San Mateo County create an urgent need to develop strategies, coordinate resources, and increase public awareness to reduce risk and prevent loss from future hazard events. Identifying risks posed by hazards and developing strategies to reduce the impact of a hazard event can assist in protecting life and property of citizens, communities, and visitors. Local residents and businesses can work together with the County to create a hazard mitigation plan (HMP) that addresses the potential impacts of hazard events.
1.3 Purposes for Planning

DMA compliance is only one of multiple objectives driving this planning effort. Elements and strategies in this plan were selected because they meet a program requirement as well as the needs of San Mateo County and its citizens. This HMP identifies resources, information, and strategies for reducing risk from natural hazards acknowledged as a concern in San Mateo County and will help guide and coordinate mitigation activities. The plan was developed to meet the following objectives:

- Meet or exceed program requirements specified under the DMA.
- Enable San Mateo County to continue using federal grant funding to reduce risk through mitigation.
- Meet the needs of San Mateo County as well as state and federal requirements.
- Create a risk assessment that focuses on San Mateo County hazards of concern.
- Coordinate existing plans and programs so that high-priority initiatives and projects to mitigate possible impacts of a disaster are funded and implemented.

1.4 Who Will Benefit from This Plan?

All residents, visitors, and businesses in San Mateo County are the ultimate beneficiaries of this HMP update. The plan identifies strategies and actions to reduce risk for those who live in, work in, go to school in, and visit San Mateo County. It provides a viable planning framework for all foreseeable natural hazards. Participation by Key stakeholders in developing the plan helped ensure that outcomes will be mutually beneficial. The plan’s goals and recommendations can lay the groundwork for development and implementation of local mitigation activities and partnerships.

1.5 Contents of This Plan

This hazard mitigation plan is organized into three primary parts:

- SECTION 1—Planning Process and Community Profile
- SECTION 2—Risk Assessment
- SECTION 3—Mitigation Strategy.

Each part includes elements required under federal guidelines. DMA compliance requirements are cited at the beginning of subsections as appropriate to illustrate compliance.

The following appendices provided at the end of the volume include information or explanations to support the main content of the plan:

- Appendix A—References
- Appendix B—Steering Committee Ground Rules
- Appendix C—Steering Committee Agendas and Meeting Minutes
- Appendix D—Public Outreach
- Appendix E—San Mateo 2010 Action Items Status
- Appendix F—Federal Emergency Management Agency (FEMA) crosswalks
- Appendix G—Plan Adoption Resolutions.
Chapter 2.
Plan Update—What Has Changed

2.1 The Previous Plan
Seventeen jurisdictions in San Mateo County were covered under the 2010 Association of Bay Area Governments (ABAG) regional planning effort. The planning process used to develop the updated ABAG plan was as follows:

- Reevaluate the Functional Areas of the 2005 plan based on prioritizing mitigation for long-term recovery issues – This reevaluation was accomplished through a series of issue-oriented forums at meetings of its main policy standing committee, the Regional Planning Committee.
- Regional mitigation priority setting by cities, counties, and special districts with public involvement – This objective was met through a series of workshops where strategies were reviewed for relevance and clarity. Three regional workshops were held to review draft priorities, and the draft priorities were posted on line for public comment.
- Develop chapters to highlight functional areas – To make a better connection between the functional areas in the 2010 plan, chapters were developed to address mitigation strategies and how they achieved functionality.
- Raise public awareness – Public awareness was achieved through a series of campaigns, including an “op-ed” hazard mitigation piece on the anniversary of the Loma Prieta earthquake, securing an opportunity for free print ad and community service space, and public meetings focusing on specific aspects of the plan.
- Focused outreach in partnership with local jurisdictions – The 2010 planning process allowed for two opportunities for public comment.

2.2 Why Update?

2.2.1 Federal Eligibility
Title 44 of the Code of Federal Regulations (44 CFR) stipulates that hazard mitigation plans must present a schedule for monitoring, evaluating, and updating the plan. This schedule provides an opportunity to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. The Robert T. Stafford Act requires jurisdictions to have current HMPs to pursue and receive federal funding.

2.2.2 Changes in Development
LHMP updates must be revised to reflect changes in development within the planning area during the previous performance period of the plan, as stated in 44 CFR Section 201.6(d)(3). The plan must describe changes in
development in hazard-prone areas that increased or decreased vulnerability since the last plan was approved. If no changes in development altered the overall vulnerability, then plan updates may validate the information in the previously approved plan. The intent of this requirement is to ensure that the mitigation strategy continues to address the risk and vulnerability of existing and potential development and takes into consideration possible future conditions that could affect vulnerability.

The San Mateo County planning area experienced a 1.6 percent increase in population between 2000 and 2010, an average annual growth rate of 0.16 percent per year (U.S. Census 2000; U.S. Census 2015). Between 2010 and 2015, the California Department of Finance estimates that the total population of San Mateo County has grown an additional 4.8 percent to 753,123 (DOF 2015). Each jurisdiction in the planning area has a General Plan that guides future growth and policy making within each local jurisdiction. The General Plan is adopted by the local governing body of each jurisdiction. This HMP update assumes that some new development triggered by increased population occurred in hazard areas. It is assumed that hazard vulnerability did not increase, although it is possible that an increase in hazard exposure has occurred, because all such new development would have been regulated pursuant to local programs and codes.

### 2.2.3 New Analysis Capabilities

The risk assessment for the previous San Mateo County HMP used both quantitative and qualitative analyses. Building count data and annualized average loss estimates were provided for some, but not all, hazards of concern. These estimates were predominantly reported at the countywide scale. The updated risk assessment provides more detailed information on exposed population and building counts for each hazard of concern. This update also expands the level of detail in the loss estimate modeling for dam and reservoir failure, earthquake, and flood. Exposure and vulnerability estimates are presented at the community planning area level. This enhanced risk assessment allows for a more detailed understanding of the ways risk in the County is changing over time.

### 2.3 The Updated Plan—What Is Different?

Although San Mateo County’s 2010 hazard mitigation plan update was prepared under the ABAG process, the County’s stakeholders, including County agencies, municipalities, and special districts, determined that a new countywide hazard mitigation plan would better suit the needs and capabilities of the County and its planning partners. The plan update process included a greater focus on public involvement that concentrated on targeted public engagement instead of simply opening technical workshops to the public. A renewed effort was made to establish a plan maintenance and implementation protocol that clearly defines San Mateo County’s commitment to the plan’s ongoing success. Some of the major differences between the current and previous plans are as follows:

- The plan has been totally restructured as a countywide regional plan, focusing only on the geographic area of San Mateo County. The risk assessment is not a subset of a larger regional effort. Instead, it is isolated to San Mateo County and focuses on the hazards of concern for the County.
The risk assessment has been prepared to best support future grant applications by providing information on risk and vulnerability that will directly support the measurement of “cost-effectiveness” required under FEMA mitigation grant programs.

Newly available data and tools provide for a more detailed and accurate risk assessment using means such as FEMA’s Hazards U.S. Multi-Hazard (HAZUS-MH) computer model or new data such as FEMA’s countywide Digital Flood Insurance Rate Maps (DFIRMs).

The planning process creates the opportunity for all municipal planning partners to prepare to meet the requirements of California Senate Bill 379 (SB 379) during the next plan update. SB 379 state will require integration of quantitative climate change risk assessment in the development of climate change related initiatives as part of the safety element of general plans.

The plan is more user-friendly because it is confined to one package.

The update created an opportunity for the County, cities, and planning partners to engage citizens directly in a coordinated approach to gauge their perception of risk and support of the concept of risk reduction through mitigation.

The plan identifies actions rather than strategies. Strategies provide direction, but actions are fundable under grant programs. This plan replaces strategies with a guiding principle, goals, and objectives. The actions identified meet multiple objectives that are measurable, so that each planning partner can measure the effectiveness of its mitigation actions.

Given the extent of changes in this update, reviewers should consider this document to be a new plan. When relevant, the update discusses correlations with the initial plan, especially when data or information is being carried over to this update. Table 2-1 indicates the major changes between the two plans as they relate to 44 CFR planning requirements.
### TABLE 2-1. PLAN CHANGES CROSSWALK

<table>
<thead>
<tr>
<th>44 CFR Requirement</th>
<th>2010 Plan update</th>
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| §201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:  
(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;  
(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and  
(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information. | Appendix A of the ABAG Plan includes a description of the planning process. It includes detail of coordination with other agencies and review of the previous plan. | The plan development process deployed under this update was completely different from that of the ABAG plan. Volume 1 Chapters 3, 4, and 5 describe the planning process for the 2016 updated plan. |
| §201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. | Appendix C of the ABAG plan includes a risk assessment for nine hazards (earthquake, tsunami, flood, landslide, wildfire, drought, climate change, dam failure, and delta levee failure) for the nine-county regional area. | Volume 1 Part 2 presents a risk assessment of nine hazards of concern: Climate change, dam failure, drought, earthquake, flood, landslide, severe weather, tsunami, and wildfire. These hazards are profiled as they impact San Mateo County.  
Additionally, human caused hazards were qualitatively assessed to develop a more complete picture of the hazards facing the county. |
### TABLE 2-1. PLAN CHANGES CROSSWALK

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| §201.6(c)(2)(i): [The risk assessment shall include a description of the ... location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events. | Appendix C of the ABAG plan includes a risk assessment for six hazards (earthquake, severe weather, flood, wildfire, landslide and tsunami) for the multi-county regional area. | Volume 1 Part 2 presents a risk assessment of each hazard of concern. Each chapter includes the following components:  
  - Hazard profile, including maps of extent and location, historical occurrences, frequency, severity, and warning time.  
  - Secondary hazards  
  - Climate change impacts  
  - Exposure of people, property, critical facilities and environment.  
  - Vulnerability of people, property, critical facilities and environment.  
  - Future trends in development  
  - Scenarios  
  - Issues |
| §201.6(c)(2)(ii): [The risk assessment shall include a description of the jurisdiction’s vulnerability to the hazards described in paragraph (c)(2)(i). This description shall include an overall summary of each hazard and its impact on the community. | Utilizing existing studies and documents, the ABAG plan discussed vulnerability with an emphasis on exposure and land use. There was extensive discussion on the vulnerability to the earthquake hazard. The ABAG risk assessment attempts to estimate potential damage from future events. ABAG concluded that HAZUS was not an adequate tool for planning purposes. | Vulnerability was assessed for all hazards of concern. The HAZUS-MH computer model was used for the dam failure, earthquake, and flood hazards. These were Level 2 – user defined analyses using city and county data. Site-specific data on County-identified critical facilities were entered into the HAZUS model. HAZUS outputs were generated for other hazards by applying an estimated damage function to an asset inventory was extracted from HAZUS-MH. |
### TABLE 2-1. PLAN CHANGES CROSSWALK

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<tbody>
<tr>
<td>§201.6(c)(2)(ii): [The risk assessment] must also address National Flood Insurance Program insured structures that have been repetitively damaged floods.</td>
<td>The ABAG plan includes summary information by county on identified repetitive losses. The plan includes a link to a website that includes more detailed information on repetitive losses which is no longer maintained. Within the plan itself, while there are inventories on the numbers and types of structures in repetitive loss areas, there is no description of the causes of repetitive flooding.</td>
<td>The plan includes a comprehensive analysis of repetitive loss areas that includes an inventory of the number and types of structures in the repetitive loss area. Repetitive loss areas are delineated, causes of repetitive flooding are cited, and these areas are reflected on maps.</td>
</tr>
<tr>
<td>§201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.</td>
<td>The focus of the ABAG plan is on existing land use without detailed discussion on future land use. There is no consistent inventory of the number and types of structures exposed to each hazard of concern. The plan does provide an inventory of identified critical facilities.</td>
<td>A complete inventory of the numbers and types of buildings exposed was generated for each hazard of concern. The Steering Committee defined “critical facilities” for the planning area, and these facilities were inventoried by exposure. Each hazard chapter provides a discussion on future development trends.</td>
</tr>
<tr>
<td>§201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) and a description of the methodology used to prepare the estimate.</td>
<td>The ABAG plan relied on creating regional correlations from past observed damage to create estimates of future losses from the hazards of concern. Appendix F assesses vulnerability by providing private building exposure estimates for earthquake, landslide, wildfire, dam failure, and 100-year flood.</td>
<td>Loss estimations in terms of dollar loss were generated for all hazards of concern. These estimates were generated by HAZUS-MH for the dam failure, earthquake, and flood hazards. For the other hazards, loss estimates were generated by applying a regionally relevant damage function to the exposed inventory. In all cases, a damage function was applied to an asset inventory. The asset inventory was the same for all hazards and was generated in HAZUS.</td>
</tr>
<tr>
<td>§201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land-use decisions.</td>
<td>A strong component of the ABAG plan is its look at existing land use in hazard areas, especially for earthquake. Appendix E provides additional detail on existing land use, with a brief discussion of future land use (through 2030) by county.</td>
<td>There is a discussion on future development trends as they pertain to each hazard of concern. This discussion looks predominantly at the existing land use and the current regulatory environment that dictates this land use.</td>
</tr>
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<td>§201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction’s blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools.</td>
<td>The ABAG plan has identified a comprehensive list of mitigation strategies for each planning partner to consider when creating annexes to the plan. These strategies were created via a facilitated process chronicled in the plan.</td>
<td>The plan contains a guiding principal, goals, objectives and actions. The guiding principal, planning partners. The actions are jurisdiction specific and strive to meet multiple objectives. The objectives of this plan are broad, similar to the strategies identified in the ABAG plan. All objectives meet multiple goals and stand alone as components of the plan. Each planning partner was asked to complete a capability assessment that looks at its regulatory, technical and financial capabilities.</td>
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<tr>
<td>§201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.</td>
<td>The ABAG plan has identified one overall goal and basic “commitments” for the plan.</td>
<td>The Steering Committee identified a guiding principal, seven goals, and 11 objectives, as described in Volume I, Section 3. These goals and objectives targeted specifically for this hazard mitigation plan are completely new. They were identified based upon the capabilities of the planning partnership.</td>
</tr>
<tr>
<td>§201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.+++</td>
<td>The ABAG plan contains a discussion on the process used to generate the mitigation strategies, but it does include an alternatives review.</td>
<td>Volume I, Section 3 includes a hazard mitigation catalog that was developed through a facilitated process. This catalog identifies actions that manipulate the hazard, reduce exposure to the hazard, reduce vulnerability, and increase mitigation capability. The catalog further segregates actions by scale of implementation. A table in the action plan section analyzes each action by mitigation type to illustrate the range of actions selected.</td>
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</table>
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<tbody>
<tr>
<td>§201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction’s participation in the National Flood Insurance Program, and continued compliance with the program’s requirements, as appropriate.</td>
<td>Strategy GOVT-c-5 deals with maintaining compliance and good standing in the National Flood Insurance Program. Strategies HSNG-h-1, LAND-c-4, and ECON-f-1 encourage participation in the CRS program.</td>
<td>All municipal planning partners that participate in the National Flood Insurance Program have identified an action stating their commitment to maintain compliance and good standing under the National Flood Insurance Program. Communities that participate in the Community Rating System have identified actions to maintain or enhance their standing under the CRS program.</td>
</tr>
</tbody>
</table>
| §201.6(c)(3)(iii): [The mitigation strategy shall describe] how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs. | Under the ABAG plan, priorities are organized based on the following categories –  
- Existing  
- Existing/underfunded  
- Very High  
- High  
- Moderate  
- Under study  
- Not applicable  
- Not yet considered | Each of the recommended initiatives is prioritized using a qualitative methodology that looked at the objectives the project will meet, the timeline for completion, how the project will be funded, the impact of the project, the benefits of the project and the costs of the project. This prioritization scheme is detailed in Chapter 19. |
| §201.6(c)(4)(i): [The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a 5-year cycle. | Appendix B of the ABAG plan contains a plan maintenance and update process. | Volume I, Section 3 details a plan maintenance strategy that contains additional detail addressing deficiencies observed during the 2010 update process. This update includes a more defined role and vehicle for facilitating the annual review of the plan. |
### Table 2-1. Plan Changes Crosswalk

<table>
<thead>
<tr>
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</table>
| §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate. | Appendix B of the ABAG plan contains a brief discussion on incorporation of the plan into other planning mechanisms. | Section 3 details recommendations for incorporating the plan into other planning mechanisms, such as:  
  - General Plan  
  - Emergency response plan  
  - Capital Improvement Programs  
  - Municipal code  
Specific current and future plan and program integration activities are detailed in each participating jurisdiction’s annex located in Volume II. |
| §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process. | The ABAG plan does not contain a process for how each jurisdiction will continue public participation in the plan maintenance process. Some of the local government annexes contain this discussion, however. | Section 3 details a comprehensive strategy for continuing public involvement. |
| §201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commission, Tribal Council). | All agencies utilizing the ABAG tools submitted to the state and FEMA individually. | Volume I, Appendix G contains the resolutions of all planning partners that adopted this plan. |
Chapter 3.
Plan Methodology

The process followed to develop this San Mateo County Hazard Mitigation Plan Update had the following primary objectives:

- Form a planning team
- Define the planning area
- Establish a steering committee
- Coordinate with other agencies
- Review existing programs
- Engage the public.

These objectives are discussed in the following sections.

3.1 Formation of the Planning Team

San Mateo County hired Tetra Tech, Inc. to assist with development and implementation of the plan. The Tetra Tech project manager and lead planner reported directly to the Steering Committee Chair and Vice Chair. A planning team was formed to lead the planning effort, consisting of the following members:

- David Pucci, Battalion Chief, Redwood City Fire Department
- Bart Spencer, Emergency Services Coordinator, Central County Fire Department
- Caitlin Kelly, Tetra Tech, Project Manager
- Rob Flaner, Tetra Tech, Principal in Charge
- Jason Geneau, Tetra Tech, Corporate Liaison
- Jessica Cerutti, Tetra Tech, Lead Planner.

3.2 Defining the Planning Area

The planning area was defined as the County of San Mateo, which consists of the mid-to southern land mass of the San Francisco Peninsula. The planning area includes San Mateo County’s 20 incorporated jurisdictions, special districts, and unincorporated areas of the County.

3.3 The Steering Committee

Hazard mitigation planning enhances collaboration and support among diverse parties whose interests can be affected by hazard losses. A steering committee was formed to oversee all phases of the plan. The members of this committee included key San Mateo County staff, citizens, and other stakeholders from within the planning area. The planning team assembled a list of candidates representing interests within the planning area that could have recommendations for the plan or be affected by its recommendations. The team
confirmed a committee of 10 members. Some members chose to designate alternates to attend on their behalf. Table 3-1 lists the committee members.

<table>
<thead>
<tr>
<th>Jurisdiction/Agency</th>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redwood City Fire Department</td>
<td>David Pucci</td>
<td>Deputy Chief</td>
</tr>
<tr>
<td>Central County Fire Department</td>
<td>Bart Spencer</td>
<td>Emergency Services Coordinator</td>
</tr>
<tr>
<td>San Mateo County Planning</td>
<td>Roberto Bartoli</td>
<td>Planner II</td>
</tr>
<tr>
<td>Pacifica Police Department</td>
<td>Joseph Spanheimer</td>
<td>Captain</td>
</tr>
<tr>
<td>Belmont Police Department</td>
<td>Patrick Halleran</td>
<td>Captain</td>
</tr>
<tr>
<td>Community College District</td>
<td>Tom Maloney</td>
<td>Emergency Preparedness Contractor</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>Kenneth Anderson, Sr.</td>
<td>Disaster Preparedness Manager</td>
</tr>
<tr>
<td>Woodside Fire District</td>
<td>Daniel Ghiorso</td>
<td>Fire Chief</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>Daniel Berumen</td>
<td>Assistant Planner</td>
</tr>
<tr>
<td>San Mateo County OES</td>
<td>Bradley Hartzell</td>
<td>Battalion Chief – Fire Liaison</td>
</tr>
</tbody>
</table>

Leadership roles and ground rules were established during the Steering Committee’s initial meeting on December 1, 2015. The Steering Committee agreed to meet monthly as needed throughout the course of the plan’s development and more frequently during the mitigation initiative development phase. The planning team facilitated each Steering Committee meeting, which addressed a set of objectives based on the work plan established for the plan update. The Steering Committee met seven times from December 2015 through June 2016. Meeting agendas, notes, and attendance logs are available for review on request. All Steering Committee meetings were open to the public, and agendas and meeting notes were posted to the hazard mitigation plan website.

3.4 Coordination with Other Agencies

Opportunities for involvement in the planning process must be provided to neighboring communities; local and regional agencies involved in hazard mitigation; agencies with authority to regulate development; and to businesses, academia, and other private and nonprofit interests (44 CFR, Section 201.6(b)(2)). The planning team accomplished this task as follows:

- **Steering Committee Involvement**—The invitation to participate on the Steering Committee was presented during the project kickoff workshop, when all incorporated jurisdictions and multiple special districts were invited. The above participants from this group volunteered to serve as the finalized Steering Committee.

- **Public Outreach and Requested Data**—The following agencies assisted with public outreach efforts, provided data that supported the risk assessment portion of the plan, or reviewed the mitigation catalog used for development of the mitigation initiative action plan:
  - San Mateo County Manager’s Office
  - San Mateo County Department of Planning and Building
3.5 Review of Existing Programs

Hazard mitigation planning must include review and incorporation, if appropriate, of existing plans, studies, reports, and technical information (44 CFR, Section 201.6(b)(3)). The following plans and programs can affect mitigation within the planning area:

- California Fire Code
- 2013 California Building Code
- California State Hazard Mitigation Forum
- Local Capital Improvement Programs
- Local Emergency Operations Plan
- Local General Plans
- Housing Element
- Safety Element
- Local Zoning Ordinances
- Local Coastal Program Policies.

Many of these relevant plans, studies, and regulations are cited in the capability assessment provided in Volume II of this plan for each participating jurisdiction.

3.6 Public Involvement

Broad public participation in the planning process helps ensure that diverse points of view about the planning area’s needs are considered and addressed. The public must have opportunities to comment on disaster mitigation plans during the drafting stages and before the plan is approved (44 CFR, Section 201.6(b)(1)). The
Community Rating System (CRS) expands on these requirements by making CRS credits available for optional public involvement activities.

### 3.6.1 Strategy

The strategy for involving the public in this plan emphasized the following elements:

- Identify and involve planning area stakeholders.
- Open Steering Committee meetings to members of the public for on-going input.
- Use a survey to evaluate whether the public’s perception of risk and support of hazard mitigation has changed since the initial planning process.
- Invite public participation at open-house public meetings.
- Attempt to reach as many planning area citizens as possible using multiple media, including social media.

Copies of materials used in the public outreach strategy are located in Appendix D of this volume.

**Stakeholders and the Steering Committee**

Stakeholders are the individuals, agencies, and jurisdictions that have a vested interest in the recommendations of the HMP. The effort to include stakeholders in this process included stakeholder participation on the Steering Committee. Stakeholders targeted for this process included the following:

- San Mateo County and local jurisdiction departments relevant for hazard mitigation planning
- Members of the academic community
- Community member representatives
- Local special-purpose districts and utilities
- Local business and visitor interests.

**Survey**

The planning team developed a 19-question hazard mitigation plan survey with guidance from the Steering Committee. The survey was used to gauge household and individual preparedness for natural hazards and the level of knowledge of tools and techniques that assist in reducing risk and loss from natural hazards. This survey was designed to help identify areas vulnerable to one or more natural hazards. Multiple methods were used to solicit survey responses:

- A web-based version of the survey was made available on the plan website in both English and Spanish (see Figure 3-1).
- Attendees at the public meetings and open houses were asked to complete a survey.
- A press release was distributed to local media urging residents to participate.
- San Mateo County jurisdictions advertised the survey on social media.
**Silver Dragon Exercise**

Each year, Community Emergency Response Teams (CERT) participate in a door-to-door exercise called Silver Dragon. This exercise is designed to simulate door-to-door check in on residents in neighborhoods selected for the exercise. Each house received a reusable bag with various information regarding public health and general preparedness. The SC coordinated with county officials in order to include a mitigation message. As a result, over 10,000 homes received a flyer regarding hazard mitigation in their Silver Dragon bag which provided an overview of the project, an invitation to take the public survey, and a link to the project website.

**Public Meetings**

A public meeting was held in conjunction with an Emergency Services Council Meeting on April 21, 2016. The meeting format allowed both government officials and members of the public to understand the project and process, and subsequently ask questions (see Figure 3-2). Additionally, members of the Steering Committee participated in a hazard mitigation booth for San Mateo County Disaster Preparedness Day on June 11, 2016. This event served as the public review meeting in which attendees were given the opportunity to speak with members of the planning team about the HMP and to provide written or verbal feedback on the draft plan (Figure 3-3).

![Figure 3-1. Sample page from survey distributed to the public (English and Spanish versions)](image)

**Jurisdiction-specific Outreach**

Planning partners decided to take a proactive approach in engaging their local residents. Many participating jurisdictions linked their local government websites to the planning project website, such as Millbrae, Pacifica, San Carlos, and Portola Valley (Figure 3-2).
FIGURE 3-2. SAMPLE JURISDICTION-SPECIFIC OUTREACH
FIGURE 3-3. PUBLIC MEETING WITH THE SAN MATEO COUNTY EMERGENCY SERVICES COUNCIL

FIGURE 3-4. DISASTER PREPAREDNESS DAY – SAN MATEO, CA
Media Outreach

Press Releases
Press releases were distributed over the course of the plan’s development as key milestones were achieved and before each public meeting. Each press release was supplemented by meeting announcements on the project website. The planning effort received the following press coverage:

- April 18, 2016 – Announcement of public meeting at the San Mateo County Emergency Services Council
- May 27, 2016 – Announcement of draft plan and mitigation booth for Disaster Preparedness Day

Copies of these press releases can be found in Appendix D of this volume.

Internet
At the beginning of the plan update process, the County established a hazard mitigation website (http://planning.smcgov.org/local-hazard-mitigation-plan) to include information about the update process (see Figure 3-5). Throughout the process, the website was used to keep the public informed on milestones and to solicit input:

![Figure 3-5. Sample Page from Hazard Mitigation Plan Website](image)

The site’s address was publicized in all press releases, mailings, surveys and public meetings. Information on the plan development process, the Steering Committee, the survey, and phased drafts of the plan was made
available to the public on the site throughout the process. San Mateo County intends to keep a website active after the plan is complete to keep the public informed about successful mitigation projects and future plan updates.

### 3.6.2 Public Involvement Results

**Survey Outreach**

A total of 1,056 respondents completed the on-line survey for this plan. Of these respondents, 91-percent indicated that they lived within San Mateo County, 54-percent work in San Mateo County, and 13-percent attend school within the county. The answers to its 19 questions helped guide the Steering Committee in affirming goals and objectives and in developing mitigation strategies. Additionally, survey results were shared with the planning partnership as part of both the Strengths, Weaknesses, Obstacles, and Opportunities session and as part of the jurisdictional annex workshop. Detailed survey results are provided in Appendix D of this volume. Key results are summarized as follows:

- Survey respondents ranked earthquake as the hazard of highest concern, followed by drought, and climate change.
- The majority of respondents received their information on disasters from local news, followed by friends/family, and San Mateo County Office of Emergency Services (OES).
- Approximately 60-percent of respondents are familiar with and subscribe to the county alert systems, SMC Alert.
- Approximately 20-percent of respondents indicated that they did not know if their home, workplace, or school is located in a hazard area.
- Nearly half of the respondents indicated that they do not have specialty insurance (earthquake, flood), because they believe it is too expensive.
- Respondents indicated that their top three recommended government actions for reducing damage from disasters are:
  1. Strengthen infrastructure (roads, water supply)
  2. Strengthen critical facilities
  3. Provide better public information about risks and vulnerable areas.

**Public Meetings**

By engaging the public through the public involvement strategy, the concept of mitigation was introduced to the public, and the Steering Committee received written feedback that was used in developing the components of the plan. The Steering Committee answered multiple technical questions regarding the plan during both meetings, however no verbal comments were received on the plan. Details of attendance and comments received are summarized in Table 3-2.
### Table 3-2: Summary of Public Meetings

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Number of Citizens in Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/21/2016</td>
<td>San Mateo County Emergency Services Council, 400 County Center, Redwood City, CA</td>
<td>27</td>
</tr>
<tr>
<td>6/10/2016</td>
<td>San Mateo County Event Center, 1346 Saratoga Drive, San Mateo, CA</td>
<td>3,000</td>
</tr>
</tbody>
</table>

**Public Comments on the Draft Plan**

The Steering Committee encouraged members of the public to review the plan, beginning on June 10, 2016. During the outreach event held at the Disaster Preparedness Fair, members of the public received a handout outlining the basic purpose of the plan and containing a link to view the plan. The handout also included a link to a form to provide plan comments. The Steering Committee received over 20 comments during the course of the public comment period, which ended on June 30, 2016. The majority of these comments included requested clarification on the model used for sea level rise and anticipated impacts of sea level rise as they relate to the coastal communities. Volume I, Section 2, Chapters 1 and 2 have been modified to address the public comments received by the Steering Committee. Additionally, members of the public provided information on jurisdictional previous hazard event history. These events were included in each respective jurisdictional annex in Volume II of this plan. Specific comments from the public and how they were addressed are available upon request.

### 3.7 Plan Development Chronology/Milestones

Table 3-3 summarizes important milestones in the development of the plan.

### Table 3-3: Plan Development Milestones

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Description</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>Steering Committee Meeting #1</td>
<td>▪ Introduce potential Steering Committee members to planning process</td>
<td>9 SC members, 1 Non-voting attendee (NVA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Discuss the role of the Steering Committee</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Review and discuss proposed charter for Steering Committee</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Review update process and schedule</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Introduce and discuss public involvement strategy</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>Steering Committee Meeting #2</td>
<td>▪ Confirm Steering Committee charter</td>
<td>9 SC Members, 3 NVA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Discuss previous plan review</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Discuss public involvement strategy</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Discuss results of vision statement and goal setting exercise</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Review and confirm critical facilities definition</td>
<td></td>
</tr>
<tr>
<td>2/02</td>
<td>Steering Committee Meeting #3</td>
<td>▪ Confirm minutes, charter and vision statement</td>
<td>8 SC Members, 3 NVA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Discuss public involvement strategy</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Discuss plan sections, including maintenance and capability assessment</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3-3. PLAN DEVELOPMENT MILESTONES

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Description</th>
<th>Attendance</th>
</tr>
</thead>
</table>
| 3/01   | Steering Committee Meeting #4  | ▪ Confirm meeting minutes  
▪ Confirm objectives  
▪ Introduce risk ranking strategy  
▪ Discuss website and outreach meetings                                           | 8 SC Members, 1 NVA  |
| 4/05   | Steering Committee Meeting #5  | ▪ Confirm minutes  
▪ Public Involvement – Outreach meetings  
▪ Plan review – maintenance, risk ranking, and adoption  
▪ Strengths, Weaknesses, Obstacles, Opportunities (SWOO) Session | 10 SC Members, 4 NVA  |
| 4/14   | Silver Dragon Exercise        | Outreach material was provided to residents throughout San Mateo County (excluding Foster City and the City of San Mateo). | Over 10,000 homes    |
| 4/21   | Public Meeting #1             | Public presentation of the project during the public San Mateo Emergency Services Council Meeting. Topics covered included:  
▪ Mitigation overview  
▪ Process overview  
▪ Planning Partnership  
▪ Hazards of concern  
▪ Q&A | 7 SC Members, 27 members of public |
| 5/03   | Steering Committee Meeting #6  | ▪ Confirm minutes  
▪ Public Meeting #1 overview  
▪ Public Meeting #2 prep  
▪ Public Survey results  
▪ SWOO results and mitigation catalog  
▪ Action plan development                                             | 9 SC Members, 4 NVA  |
| 6/07   | Steering Committee Meeting #7  | ▪ Confirm minutes  
▪ Overview of jurisdictional participation  
▪ Public involvement – June 11  
▪ CEQA exemption status  
▪ Review comments on risk ranking and Section 2  
▪ Next steps                                                                 | 10 SC Members       |
| 6/11   | Public Meeting #2             | Hazard mitigation booth as part of San Mateo County’s Disaster Preparedness Day. The booth included:  
▪ NEHRP, floodplain, and wildfire display maps  
▪ Mitigation subject matter experts for answering questions  
▪ A HAZUS workstation, where San Mateo County citizens received a property-specific risk assessment for certain hazards  
▪ Information on the draft plan, including a handout | Public contact with 225 people (based on number of handouts taken by public). 20 members of the public received a customized property risk assessment |
| 7/01   | Plan Submission               | ▪ Final draft plan submitted to the California Governor’s Office of Emergency Services and FEMA Region IX for review and approval. | N/A                   |
| X/X    | Adoption                      | ▪ Plan adopted by San Mateo County                                                              | N/A                   |
| X/X    | Final Plan Approval           | ▪ Final plan approved by FEMA                                                                    | N/A                   |
Chapter 4.
San Mateo County Profile

4.1 Geographic Overview
San Mateo County consist of approximately 530 square miles. The county is characterized by its varying geographic features, depending on region: North-County, South-County, Mid-County, and the Coast-side. The county is bounded to the north is San Francisco City and County, on the east by the San Francisco Bay, to the south is Santa Clara County, and on the west by the Pacific Ocean. The dense urbanization of the Bay Area Corridor stands in marked contrast to the agricultural, parks and preserves, and undeveloped lands of the rural Coast-side regions (Figure 4-1) (SMCH 2010).

![Figure 4-1: San Mateo County with County Regions and Zip Codes](image)

Source: SMCH, 2010

4.2 Historical Overview
The area now known as San Mateo County was originally inhabited by the Ramaytush subdivision of the Ohlone people of the central and northern California coast. The tribal life of the Ohlone was well-structured and based on ancient tradition. The main responsibility of the leadership of the Ohlone people was to maintain the status
quor and ensure that the traditions were followed and upheld while maintaining positive relationships and balance with other local tribes.

In 1822, Mexico seceded from Spain, and California became a territory of Mexico in 1824. Mexican governors of California granted the land encompassing current San Mateo County to soldiers and political allies. During Mexican times, foreigners from the United States and elsewhere began settling in the San Mateo area. Mexico ceded California to the United States through the Treaty of Guadalupe Hidalgo in 1848, and the discovery of gold in and around the Bay Area caused an influx of new settlers through 1852.

San Mateo County officially became a county in 1856. San Mateo County was split from San Francisco County as a political move to keep the established political clique in power by controlling the economic powerhouse at the northern tip of the peninsula.

The result halted development in San Mateo County, as all economic development was focused in the north. The isolation was particularly felt in the coastal areas of the county, where geological features made development difficult. Efforts to draw the coastal area out of isolation in the late 1800s and early 1900s through the Ocean Shore Railroad came to a halt during the 1906 San Francisco earthquake. The story on the Bayside, however, was different. The 1906 earthquake created a new middle class as earthquake survivors relocated to San Mateo County for more affordable housing and a stable commute via a newly established streetcar. Ten new towns were established between 1908 and 1927, and in 1928, the San Francisco Bureau of Governmental Research identified San Mateo County’s bayside as an area for future industrial growth.

The San Francisco Peninsula experienced substantial growth during World War II and the post-war periods as the military invested in defense projects and military installations around the area. After World War II, many veterans previously stationed in the area decided to settle in San Mateo County. Most of the resulting population increase occurred on the Bayside. Between 1940 and 1950, the County’s residents more than doubled in number, to 236,000. By 1960, the population nearly doubled again to 444,000, and the 1970 census listed the population at more than 557,000 (NPS 2010).

### 4.3 Major Past Hazard Events

Presidential disaster declarations are typically issued for hazard events that cause more damage than state and local governments can handle without assistance from the federal government, although no specific dollar loss threshold has been established for these declarations. A presidential disaster declaration puts federal recovery programs into motion to help disaster victims, businesses, and public entities. Some of the programs are matched by state programs. Presidential disaster, emergency, or fire management assistance declarations were issued for 21 events since 1954 in the planning area. These events are listed in Table 4-1.
TABLE 4-1. PRESIDENTIAL DISASTER, EMERGENCY, AND FIRE MANAGEMENT DECLARATIONS FOR HAZARD EVENTS IN PLANNING AREA

<table>
<thead>
<tr>
<th>Type of Event</th>
<th>Disaster Declaration #</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire</td>
<td>FM-2856</td>
<td>9/10/2010</td>
</tr>
<tr>
<td>Severe Storm(s)</td>
<td>DR-1646</td>
<td>6/5/2006</td>
</tr>
<tr>
<td>Severe Storm(s)</td>
<td>DR-1628</td>
<td>2/3/2006</td>
</tr>
<tr>
<td>Severe Storm(s)</td>
<td>DR-1203</td>
<td>2/9/1998</td>
</tr>
<tr>
<td>Severe Storm(s)</td>
<td>DR-1155</td>
<td>1/4/1997</td>
</tr>
<tr>
<td>Severe Storm(s)</td>
<td>DR-1046</td>
<td>3/12/1995</td>
</tr>
<tr>
<td>Severe Storm(s)</td>
<td>DR-1044</td>
<td>1/10/1995</td>
</tr>
<tr>
<td>Freezing</td>
<td>DR-894</td>
<td>2/11/1991</td>
</tr>
<tr>
<td>Earthquake</td>
<td>DR-845</td>
<td>10/18/1989</td>
</tr>
<tr>
<td>Flood</td>
<td>DR-758</td>
<td>2/21/1986</td>
</tr>
<tr>
<td>Coastal Storm</td>
<td>DR-677</td>
<td>2/9/1983</td>
</tr>
<tr>
<td>Flood</td>
<td>DR-651</td>
<td>1/7/1982</td>
</tr>
<tr>
<td>Drought</td>
<td>EM-3023</td>
<td>1/20/1977</td>
</tr>
<tr>
<td>Flood&lt;sup&gt;a&lt;/sup&gt;</td>
<td>DR-145</td>
<td>2/25/1963</td>
</tr>
<tr>
<td>Severe Storm(s)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>DR-138</td>
<td>10/24/1962</td>
</tr>
<tr>
<td>Flood&lt;sup&gt;a&lt;/sup&gt;</td>
<td>DR-122</td>
<td>3/6/1962</td>
</tr>
<tr>
<td>Flood&lt;sup&gt;a&lt;/sup&gt;</td>
<td>DR-82</td>
<td>4/4/1958</td>
</tr>
<tr>
<td>Fire&lt;sup&gt;a&lt;/sup&gt;</td>
<td>DR-65</td>
<td>12/29/1956</td>
</tr>
<tr>
<td>Flood&lt;sup&gt;a&lt;/sup&gt;</td>
<td>DR-47</td>
<td>12/23/1955</td>
</tr>
<tr>
<td>Flood&lt;sup&gt;a&lt;/sup&gt;</td>
<td>DR-15</td>
<td>02/05/1954</td>
</tr>
</tbody>
</table>

<sup>a</sup> Prior to 1964, federal disaster declaration were not issued specific to counties; pre-1964 declarations listed in this table are for the entire State of California, not San Mateo County specifically.

Review of these events helps identify targets for risk reduction and ways to increase a community’s capability to avoid large-scale events in the future. Still, many natural hazard events do not trigger federal disaster declaration protocol but still have significant impacts on San Mateo County. These events are also important to consider in establishing recurrence intervals for hazards of concern.

4.4 Physical Setting

This section discusses the physical area encompassing San Mateo County.

4.4.1 Geology and Topography

Because of the size and unique geographical location of San Mateo County, the topography and geology of the county varies based on location. Elevation ranges from sea level along the county coast lines and bay areas to 2,572 feet above sea level at the Santa Cruz Mountains. The Santa Cruz Mountain range bisects the county, essentially creating three separate regions: the Coast-side, Mountainside, and the Bayside.
The Bayside largely consist of mudflats, marshes, artificial fill, and broad, flat alluvial plains. The low-lying Bayside region gradually increases in slope toward the Santa Cruz Mountains, eventually becoming rolling foothills. The San Andreas Fault parallels the Santa Cruz Mountain range, delineating the threshold of the Bayside and beginning of the Santa Cruz mountainside.

The Santa Cruz Mountains are generally rugged with dense forest and steep grade, often exceeding 50 percent. This area is characterized by large amounts of open space, recreational, and trail areas, including Wunderlich Park, Huddart Park, and the Fifield-Cahill Ridge Trail.

The Coast-side of San Mateo County consists of sloping foothills of the Santa Cruz Mountains to nearly sea-level coastal terraces along the Pacific Ocean. The difference in topography along the coastline itself ranges from wide, sandy beaches to rocky coves. In some places, high, rocky cliffs have emerged from the gradual erosion of coastal terraces (SMP, 1986).

### 4.4.2 Natural Resources

San Mateo County’s natural resources range from forested mountains to bayside marshlands and coastal ecosystems. These natural resources face pressure from development, invasive species, natural hazards, and climate change. Forty species in the Bay Area are protected under the Endangered Species Act (see Section 4.10.1; CBD, 2015).

These resources are an integral part of the economy, sense of place, and traditional culture of the island communities. They need to be considered in hazard mitigation planning, because they are affected by natural hazards and can influence the way that hazards alter the built environment.

### 4.4.3 Climate

Table 4-2 summarizes normal climate data from 1981 through 2010 at National Climatic Data Center (NCDC) weather station at San Francisco International Airport.

<table>
<thead>
<tr>
<th>Precipitation (inches)</th>
<th>Temperature (°F)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Average</td>
<td>Maximum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter</td>
<td>12.28</td>
<td>45.0</td>
<td>51.3</td>
<td>57.5</td>
<td></td>
</tr>
<tr>
<td>Summer</td>
<td>0.15</td>
<td>55.2</td>
<td>63.5</td>
<td>71.8</td>
<td></td>
</tr>
<tr>
<td>Spring</td>
<td>4.72</td>
<td>49.5</td>
<td>57.1</td>
<td>64.8</td>
<td></td>
</tr>
<tr>
<td>Autumn</td>
<td>3.5</td>
<td>52.6</td>
<td>60.8</td>
<td>69.0</td>
<td></td>
</tr>
</tbody>
</table>

Source: NCDC, 2015a.
## 4.5 Land Use

Table 4-3 summarizes the area of current land uses throughout San Mateo County by building function for each jurisdiction:

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Agriculture</th>
<th>Commercial</th>
<th>Education</th>
<th>Government</th>
<th>Industrial</th>
<th>Religion</th>
<th>Residential</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATherton</td>
<td>1</td>
<td>22</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2,479</td>
<td>2,518</td>
</tr>
<tr>
<td>Belmont</td>
<td>0</td>
<td>215</td>
<td>22</td>
<td>1</td>
<td>36</td>
<td>9</td>
<td>7,426</td>
<td>7,709</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0</td>
<td>239</td>
<td>4</td>
<td>1</td>
<td>16</td>
<td>3</td>
<td>1,570</td>
<td>1,833</td>
</tr>
<tr>
<td>Burlingame</td>
<td>0</td>
<td>610</td>
<td>14</td>
<td>2</td>
<td>57</td>
<td>23</td>
<td>7,769</td>
<td>8,475</td>
</tr>
<tr>
<td>Colma</td>
<td>2</td>
<td>129</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>314</td>
<td>452</td>
</tr>
<tr>
<td>Daly City</td>
<td>6</td>
<td>557</td>
<td>29</td>
<td>2</td>
<td>9</td>
<td>32</td>
<td>22,735</td>
<td>23,370</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>9</td>
<td>118</td>
<td>16</td>
<td>1</td>
<td>24</td>
<td>33</td>
<td>4,535</td>
<td>4,736</td>
</tr>
<tr>
<td>Foster City</td>
<td>0</td>
<td>118</td>
<td>7</td>
<td>0</td>
<td>22</td>
<td>8</td>
<td>8,750</td>
<td>8,905</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>30</td>
<td>171</td>
<td>8</td>
<td>0</td>
<td>7</td>
<td>11</td>
<td>3,715</td>
<td>3,942</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>0</td>
<td>38</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3,879</td>
<td>3,922</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>3</td>
<td>471</td>
<td>18</td>
<td>2</td>
<td>72</td>
<td>27</td>
<td>9,234</td>
<td>9,827</td>
</tr>
<tr>
<td>Millbrae</td>
<td>0</td>
<td>221</td>
<td>15</td>
<td>1</td>
<td>5</td>
<td>8</td>
<td>6,505</td>
<td>6,755</td>
</tr>
<tr>
<td>Pacifica</td>
<td>4</td>
<td>226</td>
<td>27</td>
<td>1</td>
<td>2</td>
<td>21</td>
<td>11,755</td>
<td>12,036</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>3</td>
<td>37</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1,529</td>
<td>1,582</td>
</tr>
<tr>
<td>Redwood City</td>
<td>1</td>
<td>973</td>
<td>30</td>
<td>2</td>
<td>113</td>
<td>50</td>
<td>18,994</td>
<td>20,163</td>
</tr>
<tr>
<td>San Bruno</td>
<td>0</td>
<td>447</td>
<td>20</td>
<td>0</td>
<td>27</td>
<td>25</td>
<td>12,104</td>
<td>12,623</td>
</tr>
<tr>
<td>San Carlos</td>
<td>3</td>
<td>629</td>
<td>15</td>
<td>1</td>
<td>214</td>
<td>11</td>
<td>9,935</td>
<td>10,808</td>
</tr>
<tr>
<td>San Mateo</td>
<td>2</td>
<td>1,074</td>
<td>38</td>
<td>3</td>
<td>88</td>
<td>53</td>
<td>26,845</td>
<td>28,103</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>0</td>
<td>1,074</td>
<td>36</td>
<td>1</td>
<td>176</td>
<td>31</td>
<td>16,275</td>
<td>17,593</td>
</tr>
<tr>
<td>Woodside</td>
<td>1</td>
<td>53</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1,972</td>
<td>2,029</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>324</td>
<td>835</td>
<td>45</td>
<td>15</td>
<td>181</td>
<td>25</td>
<td>18,214</td>
<td>19,639</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>389</strong></td>
<td><strong>8,257</strong></td>
<td><strong>376</strong></td>
<td><strong>33</strong></td>
<td><strong>1,056</strong></td>
<td><strong>375</strong></td>
<td><strong>196,534</strong></td>
<td><strong>207,020</strong></td>
</tr>
</tbody>
</table>
4.6 Critical Facilities, Infrastructure, and Assets

Critical facilities and infrastructure are those that are essential to the health and welfare of the population. These features become especially important after a hazard event. Critical facilities typically include police and fire stations, schools, and emergency operations centers. Critical infrastructure can include the roads and bridges that provide ingress and egress and allow emergency vehicles access to those in need, and the utilities that provide water, electricity, and communication services to the community.

Critical facilities identified in this plan were selected, mapped, and included in geographic information system (GIS) databases based on information provided through the Steering Committee meetings, stakeholder information requests, and the State of California Multi-Hazard Mitigation Plan (2013). Although many facilities and assets of San Mateo County are important to the quality of life, this plan focuses on those whose loss would result in the greatest impacts on life and safety in the event of a natural hazard. These critical facilities and assets are considered imperative to the sustainability of San Mateo County. Additional information and detail will be incorporated as updates to this plan are pursued in the future. As defined for this hazard mitigation plan update, critical facilities are structures or other improvements, public or private, that, because of function, size, service area, or uniqueness, have the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired. Critical facilities may include but are not limited to health and safety facilities, utilities, government facilities, hazardous materials facilities, or vital community economic facilities.

Table 4-4 provides summaries of the general types of critical facilities. In light of the sensitivity of this information, a detailed list of facilities is not provided. The list is on file with San Mateo County. All critical facilities and point-based structures were analyzed in HAZUS-MH to help rank risk and identify mitigation actions. The risk assessment for each hazard qualitatively discusses critical facilities with regard to that hazard.
### Table 4-4. Critical Facilities and Assets in the Planning Area

<table>
<thead>
<tr>
<th>City</th>
<th>Medical and Health Services</th>
<th>Emergency Services</th>
<th>Government</th>
<th>Utilities</th>
<th>Transportation Infrastructure</th>
<th>Hazardous Materials</th>
<th>Community Economic Facilities</th>
<th>Other Assets</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>Belmont</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>25</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>13</td>
<td>52</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Burlingame</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>11</td>
<td>5</td>
<td>7</td>
<td>12</td>
<td>46</td>
</tr>
<tr>
<td>Colma</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>26</td>
<td>0</td>
<td>35</td>
</tr>
<tr>
<td>Daly City</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>33</td>
<td>0</td>
<td>11</td>
<td>29</td>
<td>81</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Foster City</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>2</td>
<td>2</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>8</td>
<td>14</td>
<td>10</td>
<td>2</td>
<td>16</td>
<td>57</td>
</tr>
<tr>
<td>Millbrae</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>0</td>
<td>5</td>
<td>7</td>
<td>27</td>
</tr>
<tr>
<td>Pacifica</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>15</td>
<td>11</td>
<td>0</td>
<td>1</td>
<td>15</td>
<td>47</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Redwood City</td>
<td>2</td>
<td>7</td>
<td>11</td>
<td>37</td>
<td>34</td>
<td>10</td>
<td>9</td>
<td>24</td>
<td>134</td>
</tr>
<tr>
<td>San Bruno</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>30</td>
<td>2</td>
<td>3</td>
<td>17</td>
<td>58</td>
</tr>
<tr>
<td>San Carlos</td>
<td>0</td>
<td>3</td>
<td>7</td>
<td>18</td>
<td>8</td>
<td>16</td>
<td>6</td>
<td>10</td>
<td>68</td>
</tr>
<tr>
<td>San Mateo</td>
<td>2</td>
<td>7</td>
<td>11</td>
<td>19</td>
<td>57</td>
<td>1</td>
<td>8</td>
<td>32</td>
<td>128</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>19</td>
<td>38</td>
<td>14</td>
<td>13</td>
<td>18</td>
<td>111</td>
</tr>
<tr>
<td>Woodside</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>1</td>
<td>13</td>
<td>4</td>
<td>32</td>
<td>117</td>
<td>5</td>
<td>2</td>
<td>27</td>
<td>201</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>81</strong></td>
<td><strong>50</strong></td>
<td><strong>188</strong></td>
<td><strong>412</strong></td>
<td><strong>71</strong></td>
<td><strong>103</strong></td>
<td><strong>269</strong></td>
<td><strong>1,184</strong></td>
</tr>
</tbody>
</table>

#### 4.7 Demographics

Some populations are at greater risk from hazard events because of decreased resources or physical abilities. Research has shown that people living near or below the poverty line, the elderly (especially older single men), individuals with disabilities, women, children, ethnic minorities, and renters all experience, to some degree,
more severe effects from disasters than does the general population. These vulnerable populations may vary from the general population in risk perception, living conditions, access to information before, during, and after a hazard event, capabilities during an event, and access to resources for post-disaster recovery. Indicators of vulnerability—such as disability, age, poverty, and minority race and ethnicity—often overlap spatially and often in the geographically most vulnerable locations. Detailed spatial analysis to locate areas where there are higher concentrations of vulnerable community members would help to extend focused public outreach and education to these most vulnerable citizens.

### 4.7.1 Population Characteristics

**Resident Population**

Knowledge of the composition of the population, how it has changed in the past, and how it may change in the future is needed for making informed decisions about the future. Information about the population is a critical part of planning because it directly relates to land needs such as housing, industry, stores, public facilities and services, and transportation. The U.S. Census Bureau estimates the County’s total resident population at 718,451 as of 2010. The California Department of Finance (DOF) estimates that the County’s total resident population is 759,155 as of January 1, 2016.

Population changes are useful socio-economic indicators. A growing population generally indicates a growing economy, while a decreasing population signifies economic decline. Table 4-5 shows the population in the planning area and the State of California from 1970 through 2015. The percentage population growth rate over that period, for San Mateo County and for the state, is shown on Figure 4-2. State of California and San Mateo County Population Growth per Decade. The planning area’s population growth of about 25 percent through the 1970s dropped to 5.4 percent in the 1980s. After an increase between 1980 and 1990, population growth declined slightly in the 1990s and dropped sharply to 1.6 percent between 2000 and 2010. Based on current DOF estimates, however, 2010 through 2015 saw a steady increase in population of about 5 percent for San Mateo County while the State of California as a whole experienced approximately only 4 percent growth. The statewide population growth rate has been consistently higher than that of San Mateo County until 2015.

<table>
<thead>
<tr>
<th></th>
<th>San Mateo County</th>
<th>State of California</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>557,361</td>
<td>19,971,069</td>
</tr>
<tr>
<td>1980</td>
<td>587,329</td>
<td>23,667,764</td>
</tr>
<tr>
<td>1990</td>
<td>649,623</td>
<td>29,760,021</td>
</tr>
<tr>
<td>2000</td>
<td>707,161</td>
<td>33,871,653</td>
</tr>
<tr>
<td>2010</td>
<td>718,451</td>
<td>37,253,956</td>
</tr>
</tbody>
</table>

*Source: CA DOF, 2013*
Figure 4-2. State of California and San Mateo County Population Growth per Decade

Note: 2015 included in analysis as current data point for 2010-2020 decade

Daily Commuting Population

According to the California Employment Development Department (EDD), in 2010, San Mateo County received an influx of approximately 150,000 daily commuters who lived in other locations, but worked in San Mateo County. The majority of commuters came from San Francisco, followed by Santa Clara County, and Alameda County. Some commuters travel to San Mateo County from as far as Sacramento and Tuolumne Counties. Conversely, approximately 146,000 residents of San Mateo County commute outside of the county on a daily basis. Figure 4-3 provides the County to County commuting estimates to San Mateo County from other counties.
In addition to those individuals whose commute terminates at a location within San Mateo County, San Francisco City and County receives the highest number of commuting workers in the nation. The highest number of commuters to San Francisco were from San Mateo County, followed by Alameda County. Santa Clara and Santa Cruz Counties also showed a high number of county-to-county commuters. Conversely, more than 100,000 workers leave San Francisco daily, with approximately 40,000 of these workers commuting to Santa Cruz, Santa Clara, or Alameda Counties. These trends indicate that while approximately 150,000 out-of-county commuters work in San Mateo County, more than 100,000 commuters pass through the county as part of their daily commute toward San Francisco and the North Bay Area or toward Alameda County and the South Bay Area.

This large commuter contingent has impacts on planning for the County’s infrastructure and service needs, as well as on planning for hazard mitigation and emergency management. Commuters may be familiar with the area immediately surrounding their place of business or regular route to work, but may be less familiar with the services and resources provided to the population during a disaster event.

### 4.7.2 Age Distribution

As a group, the elderly are more apt to lack the physical and economic resources necessary for response to hazard events and are more likely to suffer health-related consequences, making recovery slower. They are more likely to be vision, hearing, or mobility impaired and more likely to experience mental impairment or dementia. Additionally, the elderly are more likely to live in assisted-living facilities where emergency preparedness occurs at the discretion of facility operators. Emergency managers typically identify these individuals as a vulnerable population.
facilities as “critical facilities” because they require extra notice to evacuate. Elderly residents living in their own homes may have more difficulty evacuating their homes and could be stranded in dangerous situations. This population group is more likely to need special medical attention, which may not be readily available during natural disasters because of the isolation caused by the event. Specific planning attention for the elderly is an important consideration given the current aging of the American population.

Children under 14 are particularly vulnerable to disasters because of their young age and dependence on others for basic necessities. Very young children may additionally be vulnerable to injury or sickness; this vulnerability can be worsened during a natural disaster because they may not understand the measures that need to be taken to protect themselves from hazards.

The overall age distribution for the planning area is illustrated in Figure 4-4. Based on U.S. Census 2014 data estimates, 13.4 percent of the planning area’s population is 65 or older, compared with the state average of 11.4 percent. According to U.S. Census data, 29.2 percent of the over-65 population has disabilities of some kind, and 6.5 percent have incomes below the poverty line. Children under the age of 18 account for 9.5 percent of individuals who are below the poverty line. It is also estimated that 19.9 percent of the population is 14 or younger, which varies slightly from the state’s average of 20.5 percent.

### 4.7.3 Race, Ethnicity and Language

Research shows that minorities are less likely to be involved in pre-disaster planning and experience higher mortality rates during a disaster. Post-disaster recovery can be ineffective and is often characterized by assertions of cultural insensitivity. Since higher proportions of ethnic minorities may live below the poverty line than the majority population, poverty can compound vulnerability. According to the U.S. Census, the racial composition of the planning area is predominantly white, at about 56 percent. The largest minority populations are Asian at 26 percent, and other, non-identified races at approximately 8 percent. Figure 4-5 shows the racial distribution in the planning area. Based on the U.S. Census ethnicity definitions, San Mateo County consists of approximately 25-percent of individuals of Hispanic or Latino ethnicity (of any race) and approximately 75-percent of non-Hispanic or Latino ethnicity.

The planning area has a 34.4-percent foreign-born population. Other than English (46 percent), the most commonly spoken languages in the planning area are Spanish/Spanish Creole (20.2 percent) and Asian/Pacific Island languages (18.4 percent). The census estimates 18.9 percent of the residents speak English “less than very well.”
**Figure 4-4. San Mateo County Age Distribution**

Source: U.S. Census – American Community Survey 5-Year Estimates

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 5 years</td>
<td></td>
</tr>
<tr>
<td>5 to 9 years</td>
<td></td>
</tr>
<tr>
<td>10 to 14 years</td>
<td></td>
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<tr>
<td>15 to 19 years</td>
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<tr>
<td>20 to 24 years</td>
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<td>25 to 34 years</td>
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<tr>
<td>35 to 44 years</td>
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<tr>
<td>45 to 54 years</td>
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</tr>
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<td>55 to 59 years</td>
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</tr>
<tr>
<td>60 to 64 years</td>
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</tr>
<tr>
<td>65 to 69 years</td>
<td></td>
</tr>
<tr>
<td>70 to 74 years</td>
<td></td>
</tr>
<tr>
<td>75 to 79 years</td>
<td></td>
</tr>
<tr>
<td>80 to 84 years</td>
<td></td>
</tr>
<tr>
<td>85 years and over</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 4-5. Planning Area Race Distribution**

Source: U.S. Census – American Community Survey 5-Year Estimates

- White: 56.5%
- Asian: 26.0%
- Native Hawaiian and Other Pacific Islander: 1.4%
- American Indian and Alaska Native: 0.3%
- Black or African American: 2.6%
- Other: 8.4%
- Two or more races: 4.8%
### 4.7.4 Persons with Disabilities or with Access and Functional Needs

The 2010 U.S. Census estimates that 54 million non-institutionalized Americans with disabilities or with access and functional needs live in the U.S. This number equates to about one in five persons. This population is more likely to have difficulty responding to a hazard event than the general population. Local government is the first level of response to assist these individuals, and coordination of efforts to meet their access and functional needs is paramount to life safety efforts. It is important for emergency managers to distinguish between functional and medical needs to plan for incidents that require evacuation and sheltering. Knowing the percentage of population with a disability will allow emergency management personnel and first responders to have personnel available who can provide services needed by those with access and functional needs.

According to the U.S. Census 2014 estimates, persons with disabilities or others with access and functional needs make up 12.3 percent of the total civilian non-institutionalized population of San Mateo County.

### 4.8 Economy

As discussed in the Federal Emergency Management Agency (FEMA) Local Mitigation Handbook, economic resiliency drives recovery after a natural hazard event. An understanding of the major employers and economic sectors in the County whose losses or inoperability would affect the community and its ability to receive from a disaster is essential. The following provides information regarding multiple facets of the economy in San Mateo County.

#### 4.8.1 Income

In the United States, individual households are expected to use private resources to prepare for, respond to, and recover from disasters to some extent. This expectation traditionally means that households living in poverty are automatically disadvantaged when they confront hazards. Additionally, the poor typically occupy more poorly built and inadequately maintained housing. Mobile or modular homes, for example, are more susceptible to damage in earthquakes and floods than are other types of housing. Furthermore, residents below the poverty level are less likely to have insurance to compensate for losses incurred from natural disasters. As a result, residents below the poverty level have a great deal to lose during an event and are the least prepared to deal with potential losses. The events following Hurricane Katrina in 2005 illustrated that personal household economics significantly influence people’s decisions on evacuation. Individuals who cannot afford gas for their cars will likely decide not to evacuate, for example.

Based on U.S. Census Bureau estimates, estimated per capita income in the planning area in 2014 was $47,198, and the median household income was $91,421. It is estimated that about 18.5 percent of households receive an income between $100,000 and $149,999 per year and 10.1 percent of household incomes are above $150,000 annually. About 11 percent of the households in the planning area make less than $25,000 per year. According to the U.S. Census Bureau, 4.7 percent of households and 7.6 percent of individuals had income that fell below the poverty line. In 2004, Dr. Amy Glasmeier at the Massachusetts Institute of Technology (MIT) developed a preliminary living wage calculator that estimates the hourly living wage needed to support different types of families. These estimates take into consideration basic needs such as health, housing,
transportation, and other necessities and interprets the living wage as a geographically specific hourly rate required to acquire basic minimum necessities cost. Table 4-6 presents summary information from the MIT Living Wage Calculator for 2014. Each hourly rate is adjusted per each working adult (MIT 2014). For the full analysis, including a breakdown of typical expenses and typical annual salary based on occupational area, please visit [http://livingwage.mit.edu/counties/06081](http://livingwage.mit.edu/counties/06081).

| Table 4-6. Hourly Living Wage Calculation for San Mateo County, California (2014) |
|---------------------------------|---------------|---------------|---------------|---------------|
|                                | One Adult     | One Adult + One Child | Two Adults   | Two Adults + One Child |
| Living Wage                    | $14.37        | $29.37        | $11.30       | $15.83        |
| Poverty Wage                   | $5.00         | $7.00         | $3.00        | $4.00         |
| Minimum Wage                   | $9.00         | $9.00         | $9.00        | $9.00         |

### 4.8.2 Industry, Businesses and Institutions

The technological boom of the mid-2000s continues to increase its presence within San Mateo County. Located just north of Santa Clara County, parts of San Mateo County are located in the area known as “Silicon Valley.” Facebook, one of the largest social media companies today, is located in Menlo Park in southern San Mateo County. According to the January 2015 San Mateo County Economic and Industry Overview provided by the San Mateo County Economic Development Association:

- 22 of the top 100 fastest growing private companies headquartered in Silicon Valley are located in San Mateo County.
- 13 of the top 25 largest software companies in the Bay Area are headquartered in San Mateo County.
- 12 of the top 25 venture capital funded biotech companies (total venture capital funding disclosed) in the Bay Area have facilities in San Mateo County.
- 19 of the top 25 largest venture capital firms (ranked by revenue) in the Bay Area are located in San Mateo County.
- 15 of the top 25 biotech patent recipients in the Bay Area have facilities in San Mateo County.
- Seven of the top 25 largest digital entertainment companies in the Bay Area (based on number of Bay Area employees) are headquartered in San Mateo County (SAMCEDA 2015).

While the presence of tech companies and startups is anticipated to increase into the next decade, the planning area’s economy as of the 2010 US Census is strongly based in the education/healthcare/social assistance services industry (21.6 percent), followed by the professional/scientific/management services and retail trade industries. Information and agriculture/fishing/hunting/mining make up the smallest source of the local economy, at less than 1 percent. Figure 4-6 shows the breakdown of industry types in the planning area.
4.8.3 Employment Trends and Occupations

Management/business/science/arts occupations dominate the percentage of jobs in the planning area with 45 percent. Sales/office occupations make up 22.4 percent and service occupations represent 18.7 percent of the jobs in the planning area. Only about 7 percent of the employment in the planning area is in production/transportation/moving occupations (see Figure 4-7).
California state data lists the following as the largest employers in San Mateo County (EDD 2016):

- Electric Charging Station
- Electronic Arts Inc.
- Forced Dump Debris Box Services
- Franklin Resources Inc.
- Franklin Templeton Investments
- Gate Gourmet
- Gilead Sciences Inc.
- Guckenheimer Inc.
- Hyatt Regency-San Francisco
- Kaiser Permanente Medical Center
- Kaiser Permanente South San Francisco
- Lucile Packard Children's Hospital
- Motif Inc.
- Oracle Corp.
- Peninsula Pathology Associates
- San Francisco International Airport
- San Mateo County Behavioral Health and Recovery Services
- San Mateo Medical Center
- Sciex LLC
- Seton Medical Center
- SRI International Inc.
- US Department of the Interior
- Visa Inc.
- Visa International Services Association
- Visa USA Inc.
According to the American Community Survey, about 69 percent of the planning area’s population 16 and older is in the labor force. Figure 4-8 compares unemployment trends from the State of California and San Mateo County from 2004 through 2014. San Mateo County’s unemployment rate was at its lowest in 2006, at 3.7 percent, rose to 8.4 percent in 2010, and has since fallen back, to 4.2 percent, in 2014. The state unemployment rate remained higher than the County’s throughout this period.

Source: California Employment Development Department, 2015

![Unemployment Rate Graph](#)

**Figure 4-8. State of California and San Mateo County Unemployment Rate**

### 4.9 Future Trends in Development

An understanding of population and development trends can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place to protect human health and community infrastructure. The Disaster Mitigation Act (DMA) 2000 requires that communities consider land use trends, which can alter the need for, and priority of, mitigation options over time. Land use and development trends significantly affect exposure and vulnerability to various hazards. For example, significant development in a hazard area increases the building stock and population exposed to that hazard.

New development that has occurred in the last 5 years within the County and potential future development in the next 5 years, as identified by each jurisdiction, is addressed in the jurisdictional annexes located in Volume II of this plan.
4.10 Laws, Ordinances, and Programs

Existing laws, ordinances, and programs at the federal, state, and local levels can support or hinder hazard mitigation initiatives identified in this plan. Hazard mitigation plans are required to include a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information as part of the planning process, as stated in 44 CFR, Section 201.6(b)(3). Pertinent federal, state, and local laws are described below.

4.10.1 Federal

Disaster Mitigation Act of 2000

The DMA 2000 is the current federal legislation addressing hazard mitigation planning. It emphasizes planning for disasters before they occur. It specifically addresses planning at the local level, requiring plans to be in place before Hazard Mitigation Grant Program funds can become available to communities. This plan is designed to meet the requirements of DMA, improving eligibility for future hazard mitigation funds.

Endangered Species Act

The federal Endangered Species Act (ESA) was enacted in 1973 to conserve species facing depletion or extinction and the ecosystems that support them. The act sets forth a process for determining which species are threatened and endangered and requires the conservation of the critical habitat where those species live. The ESA provides broad protection for species of fish, wildlife, and plants that are listed as threatened or endangered. Provisions are made for listing species, as well as for recovery plans and designation of critical habitat for listed species. The ESA outlines procedures for federal agencies to follow when they take actions that may jeopardize listed species and contains exceptions and exemptions. It is the enabling legislation for the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Criminal and civil penalties are provided for violations of the ESA and the Convention.

Federal agencies must seek to conserve endangered and threatened species and use their authorities in furtherance of the ESA’s purposes. The ESA defines three fundamental terms:

- **Endangered** means that a species of fish, animal, or plant is “in danger of extinction throughout all or a significant portion of its range.” (For salmon and other vertebrate species, this category may include subspecies and distinct population segments.)
- **Threatened** means that a species “is likely to become endangered within the foreseeable future.” Regulations may be less restrictive for threatened species than for endangered species.
- **Critical habitat** means “specific geographical areas that are essential for the conservation and management of a listed species, whether occupied by the species or not.”

Five sections of the ESA are of critical importance to understanding it:

- **Section 4: Listing of a Species**—The National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) is responsible for listing marine species; the U.S. Fish and Wildlife Service is
responsible for listing terrestrial and freshwater aquatic species. The agencies may initiate reviews for listings, or citizens may petition for them. A listing must be made “solely on the basis of the best scientific and commercial data available.” After a listing has been proposed, agencies receive comment and conduct further scientific reviews for 12 to 18 months, after which they must decide if the listing is warranted. Economic impacts cannot be considered in this decision, but it may include an evaluation of the adequacy of local and state protections. Critical habitat for the species may be designated at the time of listing.

- **Section 7: Consultation**—Federal agencies must ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed or proposed species or adversely modify its critical habitat. This limitation includes private and public actions that require a federal permit. Once a final listing is made, non-federal actions are subject to the same review, termed a “consultation.” If the listing agency finds that an action will “take” a species, it must propose mitigations or “reasonable and prudent” alternatives to the action; if the proponent rejects these, the action cannot proceed.

- **Section 9: Prohibition of Take**—It is unlawful to “take” an endangered species, including killing or injuring it or modifying its habitat in a way that interferes with essential behavioral patterns, including breeding, feeding, or sheltering.

- **Section 10: Permitted Take**—Through voluntary agreements with the federal government that provide protections to an endangered species, a non-federal applicant may commit a take that would otherwise be prohibited as long as it is incidental to an otherwise lawful activity (such as developing land or building a road). These agreements often take the form of a “Habitat Conservation Plan.”

- **Section 11: Citizen Lawsuits**—Civil actions initiated by any citizen can require the listing agency to enforce the ESA’s prohibition of taking or to meet the requirements of the consultation process.

**The Clean Water Act**

The federal Clean Water Act (CWA) employs regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation’s surface waters so that they can support “the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water.”

Evolution of CWA programs over the last decade has included a shift from a program-by-program, source-by-source, and pollutant-by-pollutant approach to more holistic watershed-based strategies. Under the watershed approach, equal emphasis is placed on protecting healthy waters and restoring impaired ones. A full array of issues are addressed, not just those subject to CWA regulatory authority. Involvement of stakeholder groups in development and implementation of strategies for achieving and maintaining water quality and other environmental goals is a hallmark of this approach.
National Flood Insurance Program

The National Flood Insurance Program (NFIP) provides federally backed flood insurance in exchange for communities enacting floodplain regulations. Participation and good standing under NFIP are prerequisites to grant funding eligibility under the Robert T. Stafford Act. San Mateo County and multiple jurisdictions participate in the NFIP and has adopted regulations that meet the NFIP requirements. At the time of the preparation of this plan, all participating jurisdictions within San Mateo County were in good standing with NFIP requirements.

Coastal Zone Management Act

The national Coastal Zone Management Act requires federal agencies to conduct their planning, management, development, and regulatory activities in a manner consistent to the maximum extent practicable with the policies of state Coastal Zone Management (CZM) programs. State CZM lead agencies have the authority to review federal actions for consistency with their federally approved CZM programs. In California, the California Coastal Commission, the Bay Conservation and Development Commission, and the California Coastal Conservancy are the three CZM agencies empowered to conduct federal consistency reviews. The informational and procedural requirements for CZM federal consistency reviews are prescribed by federal regulations (15 CFR 930).

National Incident Management System

The National Incident Management System (NIMS) is a systematic approach for government, nongovernmental organizations, and the private sector to work together to manage incidents involving hazards. The NIMS provides a flexible but standardized set of incident management practices. Incidents typically begin and end locally, and they are managed at the lowest possible geographical, organizational, and jurisdictional level. In other instances, success depends on the involvement of multiple jurisdictions, levels of government, functional agencies, and emergency-responder disciplines. These instances necessitate coordination across this spectrum of organizations. Communities using NIMS follow a comprehensive national approach that improves the effectiveness of emergency management and response personnel across the full spectrum of potential hazards (including natural hazards, terrorist activities, and other human-caused disasters) regardless of size or complexity.

Americans with Disabilities Act and Amendments

The Americans with Disabilities Act (ADA) seeks to prevent discrimination against people with disabilities in employment, transportation, public accommodation, communications, and government activities. The most recent amendments became effective in January 2009 (P.L. 110-325). Title II of the ADA deals with compliance with the act in emergency management and disaster-related programs, services, and activities. It applies to state and local governments as well as third parties, including religious entities and private nonprofit organizations.

The ADA has implications for sheltering requirements and public notifications. During an emergency alert, officials must use a combination of warning methods to ensure that all residents have any necessary information. Those with hearing impairments may not hear radio, television, sirens, or other audible alerts,
while those with visual impairments may not see flashing lights or visual alerts. Two stand-alone technical documents have been issued for shelter operators to meet the needs of people with disabilities. These documents address physical accessibility as well as medical needs and service animals.

The ADA also intersects with disaster preparedness programs in regards to transportation, social services, temporary housing, and rebuilding. Persons with disabilities may require additional assistance in evacuation and transit (such as vehicles with wheelchair lifts or paratransit buses). Evacuation and other response plans should address the unique needs of residents. Local governments may be interested in implementing a special-needs registry to identify the home addresses, contact information, and needs for residents who may require more assistance.

### 4.10.2 State

**Alquist-Priolo Earthquake Fault Zoning Act**

The Alquist-Priolo Earthquake Fault Zoning Act was enacted in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The Alquist-Priolo Earthquake Fault Zoning Act’s main purpose is to prevent construction of buildings used for human occupancy on the surface trace of active faults. Before a new project is permitted, cities and counties require a geologic investigation to demonstrate that proposed buildings will not be constructed on active faults. The act addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards, such as liquefaction or seismically induced landslides. The law requires the State of California Geologist to establish regulatory zones around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning and controlling new or renewed construction. Local agencies must regulate most development projects within the zones. Projects include all land divisions and most structures for human occupancy.

**California General Planning Law**

California state law requires that every county and city prepare and adopt a comprehensive long-range plan to serve as a guide for community development. The general plan expresses the community’s goals, visions, and policies relative to future land uses, both public and private. The general plan is mandated and prescribed by state law (Cal. Gov. Code §65300 et seq.), and forms the basis for most local government land use decision-making.

The plan must consist of an integrated and internally consistent set of goals, policies, and implementation measures. In addition, the plan must focus on issues of the greatest concern to the community and be written in a clear and concise manner. City and county actions, such as those relating to land use allocations, annexations, zoning, subdivision and design review, redevelopment, and capital improvements, must be consistent with the plan.

**California Environmental Quality Act**

The California Environmental Quality Act (CEQA) was passed in 1970, shortly after the federal government enacted the National Environmental Policy Act, to institute a statewide policy of environmental protection.
CEQA requires state and local agencies in California to follow a protocol of analysis and public disclosure of the potential environmental impacts of development projects. CEQA makes environmental protection a mandatory part of every California state and local agency’s decision making process.

CEQA establishes a statewide environmental policy and mandates actions all state and local agencies must take to advance the policy. Jurisdictions conduct analysis of the project to determine if there are potentially significant environmental impacts, identify mitigation measures, and possible project alternatives by preparing environmental reports for projects that requires CEQA review. This environmental review is required before an agency takes action on any policy, program, or project.

The County and the unincorporated areas have sought exemption from CEQA for the Hazard Mitigation Plan based on four different sections of the CEQA Guidelines:

- **Section 15183(d):** “The project is consistent with...a general plan of a local agency, and an EIR was certified by the lead agency for the...general plan.”
- **Section 15262:** “A project involving only feasibility or planning studies for possible future actions which the agency, board or commission has not approved, adopted, or funded does not require the preparation of an EIR or negative declaration but does require consideration of environmental factors. This section does not apply to the adoption of a plan that will have a legally binding effect on later activities.”
- **Section 15306:** “(Categorical Exemption) Class 6 consists of basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. These may be strictly for information gathering purposes, or as part of a study leading to an action which a public agency has not yet approved, adopted or funded.”
- **Section 15601(b)(3):** "...CEQA applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA."

Planning partners may seek exemption at their discretion.

**California Coastal Act of 1976**

The California Coastal Act of 1976 recognized California’s coasts as an important natural resource that required permanent protection. The act permanently established the California Coastal Commission and included specific polies that address such issues and shoreline public access and development design. The act also allowed for the development of Local Coastal Programs by coastal communities regarding coastal development and regulatory oversight. These programs delineate the rules, regulations, and permitting processes for development along coastal areas for each jurisdiction. Each Local Coastal Program is reviewed and certified by the California Coastal Commission.
AB 162: Flood Planning, Chapter 369, Statutes of 2007

This California State Assembly Bill passed in 2007 requires cities and counties to address flood-related matters in the land use, conservation, and safety and housing elements of their general plans. The land use element must identify and annually review the areas covered by the general plan that are subject to flooding as identified in floodplain mapping by either FEMA or the Department of Water Resources (DWR). During the next revision of the housing element on or after January 1, 2009, the conservation element of the general plan must identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for groundwater recharge and stormwater management. The safety element must identify information regarding flood hazards, including:

- Flood hazard zones
- Maps published by FEMA, DWR, the U.S. Army Corps of Engineers, the Central Valley Flood Protection Board, and the Governor’s Office of Emergency Services (OES)
- Historical data on flooding
- Existing and planned development in flood hazard zones.

The general plan must establish goals, policies and objectives to protect from unreasonable flooding risks, including:

- Avoiding or minimizing the risks of flooding new development
- Evaluating whether new development should be located in flood hazard zones
- Identifying construction methods to minimize damage.

AB 162 establishes goals, policies and objectives to protect from unreasonable flooding risks. It establishes procedures for the determination of available land suitable for urban development, which may exclude lands where FEMA or DWR has concluded that the flood management infrastructure is not adequate to avoid the risk of flooding.

AB 2140: General Plans: Safety Element, Chapter 739, Statutes of 2006

This bill provides that the state may allow for more than 75 percent of public assistance funding under the California Disaster Assistance Act only if the local agency is in a jurisdiction that has adopted a local hazard mitigation plan (LHMP) as part of the safety element of its General Plan. The LHMP needs to include elements specified in this legislation. In addition, this bill requires CAL OES to give preference for federal mitigation funding to cities and counties that have adopted LHMPs. The intent of the bill is to encourage cities and counties to create and adopt hazard mitigation plans.

AB 70: Flood Liability, Chapter Number 367, Statutes of 2007

This bill provides that a city or county may be required to contribute a fair and reasonable share to compensate for property damage caused by a flood to the extent that it has increased the state’s exposure to liability for property damage by unreasonably approving new development in a previously undeveloped area that is protected by a state flood control project, unless the city or county meets specified requirements.
AB 32: The California Global Warming Solutions Act

This bill addresses greenhouse gas emissions. It identifies the following potential adverse impacts of global warming:

“... the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.”

AB 32 establishes a state goal of reducing greenhouse gas emissions to 1990 levels by 2020 (a reduction of approximately 25 percent from forecast emission levels), with further reductions to follow. The law requires the state Air Resources Board to do the following:

- Establish a program to track and report greenhouse gas emissions.
- Approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions from sources of greenhouse gas emissions.
- Adopt early reduction measures to begin moving forward.
- Adopt, implement and enforce regulations—including market mechanisms such as “cap and-trade” programs—to ensure that the required reductions occur.

The Air Resources Board recently adopted a statewide greenhouse gas emissions limit and an emissions inventory, along with requirements to measure, track, and report greenhouse gas emissions by the industries it determined to be significant sources of greenhouse gas emissions.

Senate Bill 97

Senate Bill 97, enacted in 2007, amends CEQA to clearly establish that greenhouse gas emissions and the effects of greenhouse gas emissions are appropriate subjects for CEQA analysis. It directs the Governor’s Office of Planning and Research to develop draft CEQA guidelines for the mitigation of greenhouse gas emissions or their effects by July 1, 2009, and directs the California Natural Resources Agency to certify and adopt the CEQA Guidelines by January 1, 2010.

Senate Bill 1241: General Plans: Safety Element – Fire Hazard Impacts

In 2012, Senate Bill 1241 was enacted, requiring that all future General Plans address fire risk in state responsibility areas and very high fire hazard severity zones in their safety element. In addition, the bill requires cities and counties to make certain findings regarding available fire protection and suppression services before approving a tentative map or parcel map.

Senate Bill 379: General Plans: Safety Element – Climate Adaptation

Senate Bill 379 builds on the flood planning inclusions into the safety and housing elements and the hazard mitigation planning safety element inclusions in General Plans outlined in AB 162 and AB 2140. SB 379 specifically focuses on a new requirement that cities and counties include climate adaptation and resiliency
strategies in the safety element of their General Plans beginning January 1, 2017. In addition, this bill requires general plans to include a set of goals, policies, and objectives, and specified implementation measures based on the conclusions drawn from climate adaptation research and recommendations.

**California State Building Code**

California Code of Regulations Title 24 (CCR Title 24), also known as the California Building Standards Code, is a compilation of building standards from three sources:

- Building standards that have been adopted by state agencies without change from building standards contained in national model codes
- Building standards that have been adopted and adapted from the national model code standards to meet California conditions
- Building standards authorized by the California legislature that constitute extensive additions not covered by the model codes adopted to address particular California concerns.

The state Building Standards Commission is authorized by California Building Standards Law (Health and Safety Code Sections 18901 through 18949.6) to administer the processes related to the adoption, approval, publication, and implementation of California’s building codes. These building codes serve as the basis for the design and construction of buildings in California. The national model code standards adopted into Title 24 apply to all occupancies in California, except for modifications adopted by state agencies and local governing bodies. Since 1989, the Building Standards Commission has published new editions of Title 24 every 3 years.

**Standardized Emergency Management System**

CCR Title 19 establishes the Standardized Emergency Management System (SEMS) to standardize the response to emergencies involving multiple jurisdictions. SEMS is intended to be flexible and adaptable to the needs of all emergency responders in California. It requires emergency response agencies to use basic principles and components of emergency management. Local governments must use SEMS by December 1, 1996, to be eligible for state funding of response-related personnel costs under CCR Title 19 (Sections 2920, 2925 and 2930). The roles and responsibilities of Individual agencies contained in existing laws or the state emergency plan are not superseded by these regulations.

**California State Hazard Mitigation Plan**

Under the DMA, California must adopt a federally approved state multi-hazard mitigation plan to be eligible for certain disaster assistance and mitigation funding. The intent of the California State Hazard Mitigation Plan is to reduce or prevent injury and damage from hazards in the state through the following:

- Documenting statewide hazard mitigation planning in California
- Describing strategies and priorities for future mitigation activities
- Facilitating the integration of local and tribal hazard mitigation planning activities into statewide efforts
- Meeting state and federal statutory and regulatory requirements.
The plan is an annex to the State Emergency Plan, and it identifies past and present mitigation activities, current policies and programs, and mitigation strategies for the future. It also establishes hazard mitigation goals and objectives. The plan will be reviewed and updated annually to reflect changing conditions and new information, especially information on local planning activities.

**Governor’s Executive Order S-13-08**

Governor’s Executive Order S-13-08 enhances the state’s management of climate impacts from sea level rise, increased temperatures, shifting precipitation and extreme weather events. There are four key actions in the executive order:

- Initiate California’s first statewide climate change adaptation strategy to assess expected climate change impacts, identify where California is most vulnerable, and recommend adaptation policies by early 2009. This effort will improve coordination within state government so that better planning can more effectively address climate impacts on human health, the environment, the state’s water supply and the economy.
- Request that the National Academy of Science establish an expert panel to report on sea level rise impacts in California, to inform state planning and development efforts.
- Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects.
- Initiate a report on critical infrastructure projects vulnerable to sea level rise.

### 4.10.3 Local

Plans, reports, and other technical information were identified and provided directly by the County, participating jurisdictions, and numerous stakeholders involved in the planning effort, as well as through independent research by the planning consultant. Relevant documents, including plans, reports, and ordinances were reviewed to identify:

- Existing jurisdictional capabilities;
- Needs and opportunities to develop or enhance capabilities, which may be identified within the local mitigation strategies;
- Mitigation-related goals or objectives, considered during the development of the overall Goals and Objectives;
- Proposed, in-progress, or potential mitigation projects, actions and initiatives to be incorporated into the updated jurisdictional mitigation strategies.

The following local regulations, codes, ordinances and plans were reviewed during this plan process in an effort to develop mitigation planning goals, objectives, and mitigation strategies that are consistent across local and regional planning and regulatory mechanisms; and thus develop complementary and mutually supportive plans, including:

- General Plans
Capability Assessment

All participating jurisdictions — including San Mateo County on behalf of the unincorporated areas, incorporated municipalities, and special districts — compiled an inventory and analysis of existing authorities and capabilities called a “capability assessment.” A capability assessment creates an inventory of an agency’s mission, programs, and policies, and evaluates its capacity to carry them out. These evaluations include assessments on legal and regulatory capabilities, fiscal capabilities, and administrative and technical capabilities. Additionally, information on NFIP compliance, classifications under various community mitigation programs, and information about public education and outreach capabilities were collected in order to develop a more complete picture of overall capability throughout the planning area. Specific capability assessments for each participating jurisdiction are available in the individual jurisdictional annexes located in Volume II of this plan.

Legal and Regulatory Capabilities

Jurisdictions have the ability to develop policies and programs and to implement rules and regulations to protect and serve residents. Local policies are typically identified in a variety of community plans, implemented via a local ordinance, and enforced through a governmental body.

Jurisdictions regulate land use through the adoption and enforcement of zoning, subdivision and land development ordinances, building codes, building permit ordinances, floodplain, and stormwater management ordinances. When effectively prepared and administered, these regulations can lead to hazard mitigation.

Fiscal Capabilities

Assessing a jurisdiction’s fiscal capability provides local governance with an understanding of the ability to fulfill the financial needs associated with hazard mitigation projects. This assessment identifies both outside resources, such as grant-funding eligibility, and local jurisdictional authority to generate internal financial capability, such as through impact fees.

Administrative and Technical Capabilities

Legal, regulatory, and fiscal capabilities are needed to provide the backbone for successfully developing a mitigation strategy, however, without appropriate personnel, the strategy may not be implemented. The Administrative and Technical Capability focuses on the availability of personnel resources responsible for
implementing multiple facets of hazard mitigation. These personnel resources include technical experts, such as engineers and scientists, as well as personnel capabilities that may be found in multiple departments, such as grant writers.

NFIP Compliance
Flooding is the #1 natural hazard in the United States and, with the promulgation of recent federal regulation, homeowners throughout the country are experiencing increasingly high flood insurance premiums. In addition, community participation in the NFIP opens up additional opportunity for grant funding associated specifically with flooding issues. Assessment of the jurisdiction’s current NFIP status and compliance provides planners with a greater understanding of the successful implementation of local flood management program and opportunities for improvement that directly affect residents and available grant funding opportunities for hazard mitigation.

Public Outreach Capability
As part of a whole community approach, regular engagement with the public on issues regarding hazard mitigation provides a jurisdiction with the opportunity to directly interface with community members. Assessing this outreach and education capability illustrates the connection between the government and community members which opens a two-way dialogue that will ideally result in a more resilient community based on education and public engagement.

Other Programs
Other programs, such as the Community Rating System, Storm Ready, and Firewise, enhance a jurisdiction’s ability to mitigate, prepare, and respond to natural hazards. These programs indicate a jurisdiction’s desire to go beyond minimum requirements set forth by local, state, and federal regulations for the purpose of creating a more resilient community. These programs complement each other by focusing on communication, mitigation, and community preparedness to save lives and minimize the impact of natural hazards on a community.
SECTION 2: HAZARD PROFILES
Chapter 1.
Identified Hazards of Concern and Risk Assessment Methodology

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from identified hazards. It allows emergency management personnel to establish early response priorities by identifying potential hazards and vulnerable assets. The process focuses on the following elements:

- **Hazard identification**—Use all available information to determine what types of hazards may affect a jurisdiction, how often they can occur, and their potential severity.
- **Vulnerability identification**—Assess the impact of hazard events on the people, property, environment, economy and lands of the region.
- **Cost evaluation**—Estimate the cost of potential damage or cost that can be avoided by mitigation.

The risk assessment for this hazard mitigation plan update evaluates the risk of natural hazards prevalent in the planning area and meets requirements of the Disaster Mitigation Act (DMA) (44 Code of Federal Regulations [CFR], Section 201.6(c)(2)).

Specific information regarding the location and individual analysis on personal, governmental, and critical infrastructure analyzed during the risk assessment process is provided in aggregate to protect individual privacy and the safety of critical facilities.

### 1.1 Identified Hazards of Concern

The Steering Committee considered the full range of natural hazards that could affect the planning area and then listed hazards that present the greatest concern. The process incorporated a review of state and local hazard planning documents as well as information on the frequency of, magnitude of, and costs associated with hazards that have strike or could affect the planning area. Anecdotal information regarding natural hazards and the perceived vulnerability of the planning area’s assets to them was also used. Based on the review, this plan addresses the following hazards of concern. (Hazards were profiled in alphabetical order; therefore, the listing of the hazard has no relevance to the hazard’s severity or level of concern.)

- Climate Change
- Dam failure
- Drought
- Earthquake
- Flood
- Landslide
- Severe Weather
In addition to the natural hazards listed above, San Mateo County decided to address additional human-caused hazards to develop a comprehensive and regional approach to hazard mitigation in the County. These human-caused hazards, with the exception of dam failure, are presented in Section 2, Chapter 11. These human-caused hazards are further categorized into man-made and technological hazards. Human-caused hazards are characterized by intentional acts for the purpose of disruption, whether fiscal, social, or other. Human-caused hazards addressed in this plan include the following:

- Terrorism
- Cyber Threats

Technological hazards are characterized by an assumed unintentional failure of a human-made mechanism or structure. Technological hazards addressed in this plan include the following:

- Hazardous Materials Release
- Pipeline and Tank Failure
- Aircraft incidents

As lessons learned from the 2016 process, the Steering Committee recommended additional hazards for consideration in future planning efforts. These include a standalone chapter for Coastal Hazards (included in the Severe Weather chapter of this plan) and health hazards.

1.2 Risk Assessment Tools

1.2.1 Mapping

National, state, and county databases were reviewed to locate available spatially based data relevant to this planning effort. Maps were produced using geographic information system (GIS) software to show the spatial extent and location of hazards identified when such datasets were available. These maps are included in the hazard profile chapters of this document.

1.2.2 HAZUS-MH

Overview

In 1997, the Federal Emergency Management Agency (FEMA) developed the standardized Hazards U.S. (HAZUS) model to estimate losses caused by earthquakes and identify areas that face the highest risk and potential for loss. HAZUS was later expanded into a multi-hazard methodology, HAZUS-MH, with new models for estimating potential losses from hurricanes and floods.

HAZUS-MH is a GIS-based software program used to support risk assessments, mitigation planning, and emergency planning and response. It provides a wide range of inventory data, such as demographics, building
stock, critical facility, transportation and utility lifeline, and multiple models to estimate potential losses from natural disasters. The program maps and displays hazard data and the results of damage and economic loss estimates for buildings and infrastructure. Its advantages include the following:

- Provides a consistent methodology for assessing risk across geographic and political entities.
- Provides a way to save data so that they can readily be updated as population, inventory, and other factors change and as mitigation planning efforts evolve.
- Facilitates review of mitigation plans because it helps to ensure that FEMA methodologies are incorporated.
- Supports grant applications by calculating benefits using FEMA definitions and terminology.
- Produces hazard data and loss estimates that can be used in communication with local stakeholders.
- Is administered by the local government and can be used to manage and update a hazard mitigation plan throughout its implementation.

Levels of Detail for Evaluation

HAZUS-MH provides default data for inventory, vulnerability, and hazards; these default data can be supplemented with local data to provide a more refined analysis. The model can carry out three levels of analysis, depending on the format and level of detail of information about the planning area:

- **Level 1**—All of the information needed to produce an estimate of losses is included in the software’s default data. These data are derived from national databases and describe in general terms the characteristic parameters of the planning area.
- **Level 2**—More accurate estimates of losses require more detailed information about the planning area. To produce Level 2 estimates of losses, detailed information is required about local geology, hydrology, hydraulics, and building inventory, as well as data about utilities and critical facilities. This information is needed in a GIS format.
- **Level 3**—This level of analysis generates the most accurate estimate of losses. It requires detailed engineering and geotechnical information to customize it for the planning area.

1.3 Overall Risk Assessment Approach

The risk assessments in Section 2, Chapters 2 through 11 describe the risks associated with each hazard of concern identified. Each chapter describes the hazard, the planning area’s vulnerabilities, and probable event scenarios. The following steps were used to define the risk of each hazard:

- **Identify and profile each hazard**—The following information is given for each hazard:
  - Geographic areas most affected by the hazard
  - Event frequency estimates
  - Severity estimates
  - Warning time likely to be available for response.
Determine exposure to each hazard—Exposure was assessed by overlaying hazard maps with an inventory of structures, facilities, and systems to decide which of them would be exposed to each hazard.

Assess the vulnerability of exposed facilities—Vulnerability of exposed structures and infrastructure was evaluated by interpreting the probability of occurrence of each event and assessing structures, facilities, and systems that are exposed to each hazard. Tools such as GIS and FEMA’s hazard-modeling program HAZUS-MH were used for this assessment for the flood, earthquake, and tsunami hazards. Outputs similar to those from HAZUS-MH were generated for other hazards, using maps generated through GIS.

1.3.1 Dam Failure, Earthquake, and Flood

The following hazards were evaluated using HAZUS-MH:

Flood—A Level 2 user-defined analysis was performed for general building stock in flood zones and for critical facilities and infrastructure. Current flood mapping for the planning area was used to delineate flood hazard areas and estimate potential losses from the 100- and 10-year flood events. To estimate damage that would result from a flood, HAZUS-MH uses pre-defined relationships between flood depth at a structure and resulting damage, with damage given as a percent of total replacement value. Curves defining these relationships have been developed for damage to structures and for damage to typical contents within a structure. By inputting flood depth data and known property replacement cost values, dollar-value estimates of damage were generated.

Tsunami—A Level 2 analysis was run using the flood methodology described above.

Earthquake—A Level 2 analysis was performed to assess earthquake exposure and vulnerability for two scenario events and two probabilistic events:
- A Magnitude-7.8 event on the San Andreas Fault with an epicenter approximately 138 miles northwest of the City of San Mateo.
- A Magnitude-7.5 event on the San Gregorio Fault with an epicenter approximately 85 miles south southeast of the City of San Mateo.
- The standard HAZUS-MH 100- and 500-year probabilistic events

1.3.2 Dam Failure, Landslide, Sea Level Rise, Severe Weather, and Wildfire

Historical datasets were not adequate to model future losses for most of the hazards of concern. However, areas and inventory susceptible to some of the hazards of concern were mapped by other means and exposure was evaluated. A qualitative analysis was conducted for other hazards using the best available data and professional judgment.
1.3.3 Drought

The risk assessment methodologies used for this plan focus on damage to structures. The risk assessment for drought was more limited and qualitative than the assessment for the other hazards of concern because drought does not affect structures.

1.4 Sources of Data Used in HAZUS-MH Modeling

1.4.1 Building and Cost Data

Replacement cost values and detailed structure information derived from parcel and tax assessor data provided by San Mateo County were loaded into HAZUS-MH. When available, an updated inventory was used in place of the HAZUS-MH defaults for critical facilities and infrastructure.

Replacement cost is the cost to replace the entire structure with one of equal quality and utility. Replacement cost is based on industry-standard cost-estimation models published in *RS Means Square Foot Costs* (RS Means, 2015). It is calculated using the RS Means square foot cost for a structure, which is based on the HAZUS-MH occupancy class (multi-family residential or commercial retail trade), multiplied by the square footage of the structure from the tax assessor data. The construction class and number of stories for single-family residential also factor into determining the square foot costs.

1.4.2 HAZUS-MH Data Inputs

The following hazard datasets were used for the HAZUS-MH Level 2 analysis conducted for the risk assessment:

- **Flood**—The effective Digital Flood Insurance Rate Map (DFIRM) for the planning area was used to delineate flood hazard areas and estimate potential losses from the 100-year and 10-year flood events. Using the DFIRM floodplain boundaries and base flood elevation information, and the County’s 5-foot digital elevation model (DEM) data, flood depth grids were generated and integrated into the HAZUS-MH model.

- **Tsunami**—Tsunami area data, provided by the Association of Bay Area Governments (ABAG), and the County’s 5-foot DEM were used to develop depth grids that were integrated into the HAZUS-MH model.

- **Earthquake**—Earthquake shake maps and probabilistic data prepared by the U.S. Geological Survey (USGS) were used for the analysis of this hazard. A National Earthquake Hazard Reduction Program (NEHRP) soils map from the California Department of Conservation and ABAG’s liquefaction susceptibility data were also integrated into the HAZUS-MH model.

1.4.3 Other Local Hazard Data

Locally relevant information on hazards was gathered from a variety of sources. Frequency and severity indicators include past events and the expert opinions of geologists, emergency management specialists, and others. Data sources for specific hazards were as follows:
San Mateo County Hazard Mitigation Plan

- **Dam Failure**—Dam inundation area data for Bear Gulch, Emerald Lake, Felt Lake, Laurel Creek, Lower Crystal Spring, Pilarcitos, Ricky Dam, San Andreas, and Searsville provided by the County.

- **Landslide**—USGS rainfall induced landslides data were provided by ABAG. Areas categorized as “mostly a landslide area” were used in the exposure analysis.

- **Sea Level Rise**—Sea level rise data were provided by ABAG and NOAA through the County of San Mateo. The 6 feet above current Mean Higher High Water level of sea rise was used for the exposure analysis.

- **Severe Storm**—No GIS format severe storm area datasets were identified for San Mateo County.

- **Wildfire**—Fire severity data was acquired from California Department of Forestry and Fire Protection (CAL FIRE).

### 1.4.4 Data Source Summary

Table 1-1 summarizes the data sources used for the risk assessment for this project.

**TABLE 1-1. HAZUS-MH MODEL DATA DOCUMENTATION**

<table>
<thead>
<tr>
<th>Data</th>
<th>Source</th>
<th>Date</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property parcel data</td>
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<td>Digital (GIS format)</td>
</tr>
<tr>
<td>Building information such as</td>
<td>San Mateo County</td>
<td>2016</td>
<td>Digital (tabular) format</td>
</tr>
<tr>
<td>area, occupancy, date of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>construction, and stories</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building replacement cost</td>
<td>RS Means</td>
<td>2015</td>
<td>Paper format. Updated RS</td>
</tr>
<tr>
<td>Population data</td>
<td>HAZUS-MH</td>
<td>2010</td>
<td>Digital (GIS and tabular)</td>
</tr>
<tr>
<td>Flood hazard data</td>
<td>FEMA</td>
<td>2015</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td>Tsunami</td>
<td>ABAG (State of California)</td>
<td>2009</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td>Earthquake shake maps</td>
<td>USGS Earthquake Hazards</td>
<td>2012</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td>Liquefaction susceptibility</td>
<td>ABAG (USGS)</td>
<td>2006</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td>NEHRP Soils</td>
<td>California Department of</td>
<td>2008</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td></td>
<td>Conservation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dam inundation areas</td>
<td>San Mateo County</td>
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<td>Digital (GIS) format</td>
</tr>
<tr>
<td>Landslide</td>
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<td>Seal Level Rise</td>
<td>ABAG (NOAA)</td>
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<td>Digital (GIS) format</td>
</tr>
<tr>
<td>Wildfire</td>
<td>CAL FIRE</td>
<td>2008</td>
<td>Digital (GIS) format</td>
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<tr>
<td>Digital Elevation Model</td>
<td>San Mateo County</td>
<td>2006</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td>Critical Facilities and Assets</td>
<td>FEMA Hazus-MH version 2.2</td>
<td>2015</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td>EOCs, police stations, airports, bus facilities, port facilities, communications facilities, electric power facilities</td>
<td>FEMA Hazus-MH version 2.2 Default Critical Facilities Data</td>
<td>2015</td>
<td>Digital (GIS) format</td>
</tr>
</tbody>
</table>
### Table 1-1. HAZUS-MH Model Data Documentation

<table>
<thead>
<tr>
<th>Data</th>
<th>Source</th>
<th>Date</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landmarks (includes fire stations, medical care facilities, police stations, schools, military facilities, ferry facilities, public facilities, government facilities)</td>
<td>San Mateo County</td>
<td>2015</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td>San Mateo County critical facilities information (includes fire stations, schools, potable water facilities, wastewater facilities)</td>
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<td>Digital (spreadsheet) format</td>
</tr>
<tr>
<td>Dams</td>
<td>San Mateo County</td>
<td>TBD</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td>Toxic Release Inventory facilities (includes hazardous material facilities)</td>
<td>Environmental Protection Agency (EPA)</td>
<td>2016</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td>State and local bridges (includes highway bridges, light rail bridges, rail bridges)</td>
<td>California Department of Transportation (Caltrans)</td>
<td>2015</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td>BART stations</td>
<td>San Mateo County</td>
<td>2015</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td>Rail stations</td>
<td>California Department of Transportation (Caltrans)</td>
<td>2013</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td>San Mateo County GIS data (includes electric power facilities, potable water facilities, wastewater facilities)</td>
<td>ArcGIS Online</td>
<td>2016</td>
<td>Digital (GIS) format</td>
</tr>
<tr>
<td>Critical facilities information provided by Colma, San Carlos, and Redwood City</td>
<td>Colma, San Carlos, Redwood City</td>
<td>2016</td>
<td>Digital (spreadsheet) format</td>
</tr>
</tbody>
</table>

### 1.5 Limitations

Loss estimates, exposure assessments, and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from the following:

- Approximations and simplifications necessary to conduct a study
- Incomplete or outdated inventory, demographic or economic parameter data
- The unique nature, geographic extent, and severity of each hazard
- Mitigation measures already employed
- The amount of advance notice residents have to prepare for a specific hazard event.
- Specific to sea level rise, there currently exists no standardized model for assessing sea level rise impacts. Different models will provide different results. Additionally, most sea level rise models do not take into account factors such as storm surge and tides. Future sea level rise models may include these additional factors, however, such modelling exceeds the purpose and scope as well as modeling capabilities of this plan.
These factors can affect loss estimates by a factor of two or more. Therefore, potential exposure and loss estimates are approximate and should be used only to understand relative risk. Over the long term, San Mateo County will collect additional data to assist in estimating potential losses associated with other hazards.
2.1 California Senate Bill No. 379

Senate Bill 379, enacted October 8, 2015, requires that local hazard mitigation plans adopted on or after January 1, 2017, consider advice provided in the Office of Planning and Research’s General Plan Guidelines and include all of the following:

- A vulnerability assessment that identifies the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, including but not limited to flood and fire hazards. Information available from federal, state, regional, and local agencies should be used in development of this assessment, including:
  - The Internet-based Cal-Adapt tool.
  - The most recent version of the California Adaptation Planning Guide.
  - Local agencies on the types of assets, resources, and populations that will be sensitive to various climate change exposures.
  - Local agencies on their current ability to deal with the impacts of climate change.
  - Historical data on natural events and hazards, including locally prepared maps of areas subject to previous risk, areas that are vulnerable, and sites that have been repeatedly damaged.
  - Existing and planned development in identified at-risk areas, including structures, roads, utilities, and essential public facilities.
  - Federal, state, regional, and local agencies with responsibility for the protection of public health and safety and the environment, including special districts and local offices of emergency services.
  - A set of adaptation and resilience goals, policies, and objectives based on the available information.
  - A set of feasible implementation measures designed to carry out the goals, policies, and objectives including, but not limited to, all of the following:
    - Feasible methods to avoid or minimize climate change impacts associated with new uses of land.
    - The location, when feasible, of new essential public facilities outside of at-risk areas, including, but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communications facilities, or identifying construction methods or other methods to minimize damage if these facilities are located in at-risk areas.
    - The designation of adequate and feasible infrastructure located in an at-risk area.
    - Guidelines for working cooperatively with relevant local, regional, state, and federal agencies.
    - The identification of natural infrastructure that may be used in adaptation projects, where feasible. Where feasible, the plan should use existing natural features and ecosystem processes, or restoration of natural features and ecosystem processes, in developing alternatives for consideration.
At the time this hazard mitigation plan was drafted, guidelines and resources are still being developed to assist local governments in meeting the intent of Senate Bill No. 379. The information in the following chapter addresses the issues presented and the intent of the requirements using the best available information at the time this plan was developed.

2.2 What is Climate Change?

Climate — consisting of patterns of temperature, precipitation, humidity, wind and seasons — plays a fundamental role in shaping natural ecosystems and the human economies and cultures that depend on them. “Climate change” refers to changes over a long period of time. Worldwide, average temperatures have increased 1.4°F since 1880 (NASA 2015). Although this increase may seem small, it can lead to large changes in climate and weather.

The warming trend and its related impacts are caused by increasing concentrations of carbon dioxide and other greenhouse gases in the earth’s atmosphere. Greenhouse gases are gases that trap heat in the atmosphere, resulting in a warming effect. Carbon dioxide is the most commonly known greenhouse gas; however, methane, nitrous oxide and fluorinated gases also contribute to warming. Emissions of these gases come from a variety of sources, such as the combustion of fossil fuels, agricultural production, changes in land use, and volcanic eruptions. According to the U.S. Environmental Protection Agency (EPA), carbon dioxide concentrations measured about 280 parts per million (ppm) before the industrial era began in the late 1700s and have risen 43 percent since then, reaching 399 ppm in 2014 (see Figure 2-1). Furthermore, scientists are able to place this rise in carbon dioxide in a longer historical context by measuring carbon dioxide in ice cores. According to these records, carbon dioxide concentrations in the atmosphere are the highest that they have been in 650,000 years (NASA 2016). According to NASA, this trend is of particular significance “because most of it is very likely human-induced and [it is] proceeding at a rate that is unprecedented in the past 1,300 years” (NASA 2016). There is broad scientific consensus (97 percent of scientists) that climate-warming trends are very likely the result of human activities (NASA 2016). Unless emissions of greenhouse gases are substantially reduced, this warming trend and its associated impacts are expected to continue.
Climate change will affect the people, property, economy, and ecosystems of San Mateo County in a variety of ways. Climate change impacts are most frequently associated with negative consequences, such as increased vulnerability to flood or increased heat-related illnesses and public health concerns; however, other changes may present opportunities. The most important effect for development of this plan is that climate change will have a measurable impact on the occurrence and severity of natural hazards.

### 2.3 How Climate Change Affects Hazard Mitigation

An essential aspect of hazard mitigation is predicting the likelihood of hazard events in a planning area. Typically, predictions are based on statistical projections from records of past events. This approach assumes that the likelihood of hazard events remains essentially unchanged over time. Thus, averages based on the past frequencies of, for example, floods are used to estimate future frequencies: if a river has flooded an average of once every 5 years for the past 100 years, then it can be expected to continue to flood an average of once every 5 years.

The assumption that future behavior will be equivalent to past behavior for hazards that are affected by climate conditions is not valid if climate conditions are changing. As flooding is generally associated with the frequency and quantity of precipitation, for example, the frequency of flooding will not remain constant if broad precipitation patterns change over time. Specifically, as hydrology changes, storms currently considered to be a 1-percent-annual-chance event (100-year flood) might strike more often, leaving many communities at greater risk. The risks of, landslide, severe storms, extreme heat, and wildfire are all affected by climate patterns as well. For this reason, an understanding of climate change is pertinent to efforts to mitigate natural dangers.
hazards. Information about how climate patterns are changing provides insight on the reliability of future hazard projections used in mitigation analysis. This chapter summarizes current understandings about climate change to provide a context for the recommendation and implementation of hazard mitigation measures.

### 2.4 Current Indications of Climate Change

The major scientific agencies of the United States and the world — including the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA) and the Intergovernmental Panel on Climate Change (IPCC) — agree that climate change is occurring. Multiple temperature records from all over the world have shown a warming trend, and IPCC has stated that the warming of the climate system is unequivocal (IPCC 2014). Of the 10 warmest years in the 134-year record, all but one (1998) occurred since 2000, and 2015 was the warmest year on record (NASA 2016). Worldwide, average temperatures have increased 1.4°F since 1880 (NASA 2016).

Rising global temperatures have been accompanied by other changes in weather and climate. Many places have experienced changes in rainfall resulting in more intense rain, as well as more frequent and severe heat waves (IPCC 2014). The planet’s oceans and glaciers have also experienced changes: oceans are warming and becoming more acidic, ice caps are melting, and sea levels are rising (NASA 2016). Global sea level has risen approximately 6.7 inches, on average, in the last 100 years (NASA 2016). This rise has already put some coastal homes, beaches, roads, bridges, and wildlife at risk (USGCRP 2009).

NASA currently maintains information on the vital signs of the planet. At the time this plan was developed, the following trends and status of these signs are as follows (NASA 2016):

- **Carbon Dioxide**—Increasing trend, currently at 403.28 parts per million
- **Global Temperature**—Increasing trend, increase of 1.4 degrees Fahrenheit since 1880
- **Arctic Ice Minimum**—Decreasing trend, 13.4 percent per decade
- **Land Ice**—Decreasing trend, 287.0 billion metric tons per year
- **Sea Level**—Increasing trend, 3.4 millimeters (mm) per year.

### 2.5 Projected Future Impacts

The Third National Climate Assessment Report for the United States indicates that impacts from climate change will continue through the 21st century and beyond. Not all changes are understood at this time and the impacts of those changes will depend on global emissions of greenhouse gases and sensitivity in human and natural systems. Still, the following impacts are expected in the United States (NASA 2016):

- Temperatures will continue to rise
- Growing seasons will lengthen
- Precipitation patterns will change
- Droughts and heat waves will increase
- Hurricanes will become stronger and more intense
- Sea level will rise 1 to 4 feet by 2100
The Arctic may become ice free.

The California Climate Adaptation Planning Guide outlines the following climate change impact concerns for Bay Area Communities (Cal EMA et al. 2012):

- Increased temperature
- Reduced precipitation
- Sea level rise – coastal inundation and erosion
- Public health – heat and air pollution
- Reduced agricultural productivity
- Inland flooding
- Reduced tourism.

Cal-Adapt, a publicly available resource that offers information on how climate change might affect local communities, provides visualization tools that present the most current data available whenever possible. While best available data are used, it is important to remember that climate change projections involve inherent uncertainty. This uncertainty is largely derived from the fact that climate projections depend on future greenhouse gas emission scenarios and that different climate change models result in differing outcomes or impacts. Generally, the uncertainty in greenhouse gas emissions is addressed by the presentation of differing climate pathways: low or high emissions scenarios. In low emission scenarios, greenhouse gas emissions are reduced substantially from current levels. In high emissions scenarios, greenhouse gas emissions generally increase or continue at current levels. Uncertainty in outcomes is generally addressed by averaging a variety of model outcomes. Despite this uncertainty, climate change projections present valuable information to help guide decision-making for possible future conditions. Information presented by Cal-Adapt for San Mateo’s local climate snapshot is as follows:

### 2.5.1 Precipitation

According to Cal-Adapt, precipitation projections for California remain uncertain. Models show differing impacts, from slightly wetter winters to slightly drier winters, with the potential for a 10 to 20 percent decrease in total annual precipitation (Cal-Adapt 2016). Changes in precipitation patterns coupled with warmer temperatures may lead to significant changes in hydrology. In the high emission scenario, more precipitation may fall as rain rather than snow and this snow may melt earlier in the season, thus altering the timing of changes in stream flow and flood events (Cal-Adapt 2016).

### 2.5.2 Temperature

The historical average (1961-1990) temperature in San Mateo County is 56.4°F. The average temperature in the County is expected to increase above this baseline by 3.2°F in the low emissions scenario and 5.4°F in the high emissions scenario by 2090 (Figure 2-2).
2.5.3 Snow Pack

While there are no snow water equivalency measurements for San Mateo County, Cal-Adapt indicates that some parts of California should expect snow pack levels to be reduced by up to 25 inches from the baseline (1961-1990) by 2090.

2.5.4 Sea Level Rise

As sea levels rise, more areas will be vulnerable to a 1 percent annual chance or 100 year flood event. In San Mateo County, it is estimated that the land area vulnerable may increase by 22 percent in the Bay Area and by 19 percent on the coast if 55.12 inches (140 centimeters or 4.59 feet) of sea level rise occurs (Figure 2-3).
2.5.5 Wildfire

Wildfire risk is expected to change in the coming decades. Under high emission scenarios, the fire risk in San Mateo County may increase by 1.14 times the current risk by 2085, while the risk may be 0.98 the current risk in low emission scenarios (Figure 2-4).

![Figure 2-4. Projected change in fire risk in San Mateo County](image)

2.6 Responses to Climate Change

Communities and governments worldwide are working to address, evaluate, and prepare for climate changes that are likely to affect communities in coming decades. Generally, climate change discussions encompass two separate but inter-related considerations: mitigation and adaptation. The term “mitigation” can be confusing, because its meaning changes across disciplines:

- Mitigation in restoration ecology and related fields generally refers to policies, programs, or actions that are intended to reduce or to offset the negative impacts of human activities on natural systems. Generally, mitigation can be understood as avoiding, minimizing, rectifying, reducing or eliminating, or compensating for known impacts (CEQ 1978).
- Mitigation in climate change discussions is defined as “a human intervention to reduce the impact on the climate system.” It includes strategies to reduce greenhouse gas sources and emissions and enhance greenhouse gas sinks (EPA 2013c).
- Mitigation in emergency management is typically defined as the effort to reduce loss of life and property by lessening the impact of disasters (FEMA 2013).

Mitigation is used as defined by the climate change community in this chapter. Mitigation in the other chapters of this plan is primarily used in an emergency management context.

Adaptation is defined by the IPCC as “the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities, in some
natural systems, human intervention may facilitate adjustment to expected climate and its effects” (IPCC 2014).

Mitigation and adaptation are related, as the world’s ability to reduce greenhouse gas emissions will affect the degree of adaptation that will be necessary. Some initiatives and actions can both reduce greenhouse gas emissions and support adaptation to likely future conditions. According to a 2014 document compiled by the Bay Area Climate and Energy Resilience Project, nine communities within San Mateo County have developed greenhouse gas emission reduction goals, and at least seven communities had begun work to compile information on or to develop adaptation strategies (BACERP 2014).

Societies across the world are facing the need to adapt to changing conditions associated with natural disasters and climate change. Farmers are altering crops and agricultural methods to deal with changing rainfall and rising temperature; architects and engineers are redesigning buildings; and planners are looking at managing water supplies to deal with droughts or flooding.

Most ecosystems show a remarkable ability to adapt to change and to buffer surrounding areas from the impacts of change. Forests can bind soils and hold large volumes of water during times of plenty, releasing it through the year; floodplains can absorb vast volumes of water during peak flows; and coastal ecosystems can hold out against storms, attenuating waves and reducing erosion. Other ecosystem services — such as food provision, timber, materials, medicines, and recreation — can provide a buffer to societies in the face of changing conditions.

Ecosystem-based adaptation is the use of biodiversity and ecosystem services as part of an overall strategy to help people adapt to the adverse effects of climate change. It includes the sustainable management, conservation, and restoration of specific ecosystems that provide key services.

2.7 Climate Change Impacts on Hazards

The following sections provide information on how each hazard of concern identified for this planning process may be altered by climate change and how these impacts may alter current exposure and vulnerability for the people, property, critical facilities, and the environment in San Mateo County to these hazards. For detailed hazard profiles and risk assessment information on each hazard, please see Chapters 3 through 11.

2.7.1 Dam Failure

Impacts to Hazard

On average, changes in California’s annual precipitation levels are not expected to be dramatic; however, small changes may have significant impacts for water resource systems, including dams. Dams are designed partly based on assumptions about a river’s flow behavior, expressed as hydrographs. Changes in weather patterns can have significant effects on the hydrograph used for the design of a dam. If the hygrograph changes, it is conceivable that the dam can lose some or all of its designed margin of safety, also known as freeboard. If freeboard is reduced, dam operators may be forced to release increased volumes earlier in a storm cycle to maintain the required margins of safety. Such early releases of increased volumes can increase the potential
for flood downstream. According to the California Department of Water Resources (DWR), since the 1950s, flood flows on many California rivers have been record setting. As a result, water infrastructure, such as dams, have been forced to manage flows they were not designed to address (DWR 2007). The California Division of Dam Safety (DODS) has indicated that climate change may result in the need for increased safety precautions to address higher winter runoff, frequent fluctuations of water levels, and increased potential for sedimentation and debris accumulation from changing erosion patterns and increases in wildfires. Furthermore, DODS indicates that climate change “will impact the ability of dam operators to estimate extreme flood events” (DWR 2008).

Dams are constructed with safety features known as “spillways.” Spillways are put in place on dams as a safety measure in the event the reservoir fills too quickly. Spillway overflow events, often referred to as “design failures,” result in increased discharges downstream and increased flooding potential. Although climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures.

**Population**

Population exposure and vulnerability to the dam failure hazard is unlikely to change as a result of climate change.

**Property**

Property exposure and vulnerability to the dam failure hazard is unlikely to change as a result of climate change.

**Critical Facilities**

The exposure and vulnerability of critical facilities are unlikely to change as result of climate change. Dam owners and operators may need to alter maintenance and operations to account for changes in the hydrograph and increased sedimentation.

**Environment**

The exposure and vulnerability of the environment to dam failure is unlikely to change as a result of climate change. Ecosystem services may be used to mitigate some of the factors that may increase the aforementioned risk of design failures, such as increasing the natural water storage capacity in watersheds above dams.

### 2.7.2 Drought

**Impacts to Hazard**

The long-term effects of climate change on regional water resources are unknown, but global water resources are already experiencing the following stresses without climate change:

- Growing populations
- Increased competition for available water
- Poor water quality
- Environmental claims
- Uncertain reserved water rights
With a warmer climate, droughts could become more frequent, more severe, and longer-lasting. According to the National Climate Assessment, “higher surface temperatures brought about by global warming increase the potential for drought. Evaporation and the higher rate at which plants lose moisture through their leaves both increase with temperature. Unless higher evapotranspiration rates are matched by increases in precipitation, environments will tend to dry, promoting drought conditions (Globalchange.gov 2014). The potential impacts and likelihood of drought are uncertain because expected changes in precipitation patterns are still uncertain. That being said, DWR has already noted the impact of climate change on statewide water resources by charting changes in snowpack, sea level, and river flow. As temperatures rise and more precipitation comes in the form of rain instead of snow, these changes will likely continue or grow even more significant. DWR estimates that the Sierra Nevada snowpack, which supplies water for San Mateo County and other parts of the state, will experience a 48-65 percent loss by the end of the century, based off historic April 1<sup>st</sup> averages (CA DWR 2016).

Increasing temperatures may also increase net evaporation from reservoirs from between 15 and 37 percent (CA DWR 2013).

By addressing current stresses on water supplies and by building a flexible, robust program, the County will be able to more adeptly respond to changing conditions and to survive dry years.

**Population**

Population exposure and vulnerability to drought is unlikely to increase as a result of climate change. While greater numbers of people may need to engage in behavior change, such as water saving efforts, significant life or health impacts are unlikely.

**Property**

Property exposure and vulnerability may increase as a result of increased drought resulting from climate change, although this would most likely occur in non-structural property such as crops and landscaping. It is unlikely that structure exposure and vulnerability would increase as a direct result of drought, although secondary impacts of drought, such as wildfire, may increase and threaten structures.

**Critical Facilities**

Critical facility exposure and vulnerability is unlikely to increase as a result of increased drought resulting from climate change; however, critical facility operators may need to alter standard management practices and actively manage resources, particularly in water-related service sectors.

**Environment**

The vulnerability of the environment may increase as a result of increased drought resulting from climate change. Prolonged or more frequent drought resulting from climate change may further stress the ecosystems in the region, which include many special status species (Cal EMA et al. 2012).
2.8 Earthquake

*Impacts to Hazard*

The impacts of global climate change on earthquake probability are unknown. Some scientists say that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the earth’s crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity, according to research into prehistoric earthquakes and volcanic activity. NASA and U.S. Geological Survey (USGS) scientists found that retreating glaciers in southern Alaska may be opening the way for future earthquakes (NASA, 2004).

Secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms or heavy precipitation could experience liquefaction or an increased propensity for slides during seismic activity caused by the increased saturation. Dams storing increased volumes of water as a result of changes in the hydrograph could fail during seismic events.

*Population, Property, Critical Facilities, and the Environment*

Increases in exposure and vulnerability of the local resources are not able to be determined because impacts on the earthquake hazard are not well understood.

2.9 Flood

*Impacts to Hazard*

Global climate change could trigger an increase in flood activity in two ways: flooding associated with sea level rise, and atmospheric changes that alter the frequency, duration, and intensity of storms that cause flooding.

*Changes in Hydrology*

Use of historical hydrologic data has long been the standard of practice for designing and operating water supply and flood protection projects. For example, historical data are used for flood forecasting models and to forecast snowmelt runoff for water supply. This method of forecasting assumes that the climate of the future will be similar to that of the period of historical record. However, the hydrologic record cannot be used to predict changes in the frequency and severity of extreme climate events such as floods. Going forward, models must be calibrated or statistical relations developed more frequently, new forecast-based tools must be developed, and a standard of practice that explicitly considers climate change must be adopted. Climate change is already altering water resources, and resource managers have observed the following:

- Historical hydrologic patterns can no longer be solely relied on to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply and quality, flood management, and ecosystem functions.
- Extreme climatic events will become more frequent, necessitating improvement in flood protection, drought preparedness, and emergency response.
The amount of snow is critical for water supply and environmental needs, but so is the timing of snowmelt runoff into rivers and streams. Rising snowlines caused by climate change will allow more mountain areas, such as the Sierra Nevada watersheds, to contribute to peak storm runoff. (See the Drought section for how snowpack changes are affecting water supply.) High frequency flood events (such as 10-year floods) in particular will likely increase with a changing climate. Along with reductions in the amount of the snowpack and accelerated snowmelt, scientists project greater storm intensity, resulting in more direct runoff and flooding. Changes in watershed vegetation and soil moisture conditions will likewise change runoff and recharge patterns. As stream flows and velocities change, erosion patterns will also change, altering channel shapes and depths, possibly increasing sedimentation behind dams, and affecting habitat and water quality. With potential increases in the frequency and intensity of wildfires caused by climate change, there is potential for more floods after a fire, which increase sediment loads and water quality impacts.

As hydrology changes, what is currently considered a 1-percent-annual-chance (100-year flood) may strike more often, leaving many communities at greater risk. Planners will need to factor a new level of safety into the design, operation, and regulation of flood protection facilities such as dams, bypass channels, and levees, as well as the design of local sewers and storm drains.

Sea Level Rise

There is evidence that the global sea is rising at an increased rate and will continue rising over the next century. The two major causes of sea level rise are thermal expansion caused by the warming of the oceans and the loss of land-based ice (glaciers and polar ice caps) through increased melting. Thermal expansion can account for 50 percent of sea level rise and is a result of warming atmospheric temperatures and subsequent warming of ocean waters, causing the expansion. Since 1900, records and research have shown that the sea level has been steadily rising at a rate of 0.04 to 0.1 inch per year (NOAA 2013). Although that rise may seem like a small amount, such increases add up over time. In fact, water levels in San Francisco Bay have risen 7 inches in the past century. Significant enough sea level rise could affect up to 330 square miles of low-lying land around the San Francisco Bay area (including but not limited to San Mateo County). Additionally, sea level rise will also increase the risk of erosion and the adverse impacts of storm surge and high waves (DWR 2013).

There are two types of sea level: global and relative. Global sea level rise refers to the increase currently observed in the average global sea level trend (primarily attributed to changes in ocean volume caused by ice melt and thermal expansion). The melting of glaciers and continental ice masses can contribute significant amounts of freshwater input to the earth’s oceans. In addition, a steady increase in global atmospheric temperature creates an expansion of salt water molecules, increasing ocean volume.

Local sea level refers to the height of the water as measuring along the coast relative to a specific point on land. Water level measurements at tide stations are referenced to stable vertical points on the land and a known relationship is established. Measurements at any given tide station include both global sea level rise and vertical land motion (subsidence, glacial rebound, or large-scale tectonic motion). The heights of both the land and water are changing; therefore, the land-water interface can vary spatially and temporally and must be defined over time. Relative sea level trends reflect changes in local sea level over time and are typically the
most critical sea level trend for many coastal applications (coastal mapping, marine boundary delineation, coastal zone management, coastal engineering, and sustainable habitat restoration) (NOAA 2013).

Short-term variations in the sea level typically occur on a daily basis and include waves, tides, or specific flood events. Long-term variations in the sea level occur over various time scales, from monthly to yearly, and may be repeatable cycles, gradual trends, or intermittent differences. Seasonal weather patterns (changes in the Earth’s declination), changes in coastal and ocean circulation, anthropogenic influences, vertical land motion, and other factors may influence changes in the sea level over time. When sea level trends are estimated, a minimum of 30 years of data are used to account for long-term sea level variations and reduce errors in computing sea level trends based on the monthly mean sea level (NOAA 2013).

**Sea Level Rise Exposure Estimates**

The NOAA Coastal Services Center has developed a dataset to show potential sea level rise inundation ranging from 1 to 6 feet above current levels. The purpose of these data is to provide a preliminary look at sea level rise and coastal flooding impacts. According to NOAA, the data illustrate the scale of potential flooding, not the exact location, and do not account for erosion, subsidence, or future construction. Water levels are shown as they would appear during the highest high tides, excluding wind driven tides (NOAA 2015).

An exposure analysis was performed using the 6-foot sea level rise data to estimate the potential impacts to resources within the planning area. It is important to note that this assessment assumes that these impacts occur in present-day San Mateo County, rather than gradually over years or decades. Figure 2-5 provides the inundation area for the six foot sea level rise analysis. Alternate models for sea level rise are readily available for public viewing. These alternate models are provided for informational purposes only and do not supersede the analysis conducted on the selected best available data for this plan. These alternate models may be viewed at the following websites:

- Our Coast, Our Future - http://data.prbo.org/apps/ocof/
- NOAA¹ - https://coast.noaa.gov/slr/

¹ The NOAA interactive map uses a similar dataset to that analyzed in this plan’s assessment. The interactive map expands the dataset to denote low-lying areas.
Figure 2-5 provides a regional overview of sea-level rise. Jurisdiction-specific sea level rise maps are available, where applicable, in the jurisdictional annexes located in Volume II.
Population

All populations currently residing in sea level rise inundation areas would be exposed to the sea level rise hazard. It is unlikely that exposure would result in death or injury because sea level rise is expected to occur gradually over years and decades; however, residents in these areas would need to relocate. Table 2-1 shows the estimated population for each jurisdiction currently residing in potential sea level rise inundation areas.

**Table 2-1. Population within 6 Foot Sea Level Rise Inundation Areas**

<table>
<thead>
<tr>
<th></th>
<th>Population Exposed</th>
<th>% of Total Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Belmont</td>
<td>1,902</td>
<td>7.1%</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Burlingame</td>
<td>846</td>
<td>2.8%</td>
</tr>
<tr>
<td>Colma</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daly City</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>11,725</td>
<td>40.2%</td>
</tr>
<tr>
<td>Foster City</td>
<td>32,390</td>
<td>100.0%</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>1,964</td>
<td>5.9%</td>
</tr>
<tr>
<td>Millbrae</td>
<td>739</td>
<td>3.2%</td>
</tr>
<tr>
<td>Pacifica</td>
<td>20</td>
<td>0.0%</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Redwood City</td>
<td>24,167</td>
<td>29.5%</td>
</tr>
<tr>
<td>San Bruno</td>
<td>1,603</td>
<td>3.6%</td>
</tr>
<tr>
<td>San Carlos</td>
<td>534</td>
<td>1.8%</td>
</tr>
<tr>
<td>San Mateo</td>
<td>39,899</td>
<td>39.3%</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>28</td>
<td>0.0%</td>
</tr>
<tr>
<td>Woodside</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>103</td>
<td>0.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>115,904</strong></td>
<td><strong>15.4%</strong></td>
</tr>
</tbody>
</table>

*The population exposed is established by the percent of total residential buildings that are exposed multiplied by the estimated 2015 population.*

Property

All property located within the sea level rise inundation areas would be exposed to the hazard; however, gradual sea level rise may allow for a managed retreat from areas likely to be inundated. In addition to properties located within the inundation area, properties at the edge of the inundation area may be exposed to storm surge or other coastal hazards. Table 2-2 summarizes the value of planning area buildings in the inundation area.

More than 16 percent of the total replacement value of the planning area is exposed to sea level rise. Table 2-3 lists the structure type of buildings in the inundation areas. Residential properties make up 93 percent of this exposure. The current distribution of land uses in sea level rise inundation areas is shown in Table 2-4.
## Table 2-2. Value of Structures within 6 Foot Sea Level Rise Inundation Areas

<table>
<thead>
<tr>
<th></th>
<th>Value Exposed</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Building</td>
<td>Contents</td>
</tr>
<tr>
<td>Atherton</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Belmont</td>
<td>$395,204,419</td>
<td>$329,674,930</td>
</tr>
<tr>
<td>Brisbane</td>
<td>$17,328,240</td>
<td>$17,328,240</td>
</tr>
<tr>
<td>Burlingame</td>
<td>$2,714,669,560</td>
<td>$2,566,247,168</td>
</tr>
<tr>
<td>Colma</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Daly City</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>$1,043,061,421</td>
<td>$881,113,700</td>
</tr>
<tr>
<td>Foster City</td>
<td>$4,843,529,380</td>
<td>$3,342,664,716</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>$1,195,475,133</td>
<td>$1,280,368,711</td>
</tr>
<tr>
<td>Millbrae</td>
<td>$271,002,459</td>
<td>$203,639,591</td>
</tr>
<tr>
<td>Pacifica</td>
<td>$1,600,830</td>
<td>$800,415</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Redwood City</td>
<td>$7,477,738,926</td>
<td>$6,801,246,307</td>
</tr>
<tr>
<td>San Bruno</td>
<td>$271,833,972</td>
<td>$224,496,562</td>
</tr>
<tr>
<td>San Carlos</td>
<td>$1,622,747,334</td>
<td>$1,813,902,740</td>
</tr>
<tr>
<td>San Mateo</td>
<td>$7,101,978,923</td>
<td>$5,479,532,674</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>$1,704,503,151</td>
<td>$1,798,466,620</td>
</tr>
<tr>
<td>Woodside</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>$210,449,394</td>
<td>$233,675,248</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$28,869,789,115.81</strong></td>
<td><strong>$24,972,490,609.12</strong></td>
</tr>
</tbody>
</table>

[^1]: Percentages are based on the total replacement value for individual jurisdictions, not for the planning area as a whole. The “total” percentage shown is based on the sum of replacement values for jurisdictions in this table.

**Note:** Values shown are accurate only for comparison among results in this plan.

## Table 2-3. Present Land Use/Structure Type within 6 Foot Sea Level Rise Inundation Areas

<table>
<thead>
<tr>
<th></th>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Agriculture / Forestry</th>
<th>Religion</th>
<th>Government</th>
<th>Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Belmont</td>
<td>528</td>
<td>14</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>546</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Burlingame</td>
<td>220</td>
<td>237</td>
<td>52</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>510</td>
</tr>
<tr>
<td>Colma</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Daly City</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>1,825</td>
<td>26</td>
<td>19</td>
<td>6</td>
<td>7</td>
<td>0</td>
<td>11</td>
<td>1,894</td>
</tr>
<tr>
<td>Foster City</td>
<td>8,750</td>
<td>117</td>
<td>22</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>7</td>
<td>8,904</td>
</tr>
</tbody>
</table>
**Future Land Use**

While coastal communities will experience some degree of future exposure based on anticipated land use, the majority of future impact will revolve around the bayside communities. Redwood City can expect to experience the largest exposure in terms of acreage with over 18,000 acres exposed to a 6 ft. sea level rise.

Table 2-4 provides a detailed analysis of future land use exposure to sea level rise.

**Critical Facilities**

Table 2-5 shows the critical facilities located in the sea level rise inundation areas. All facilities located in these areas are exposed and potentially vulnerable to impacts from sea level rise. 296 of the planning area’s critical facilities (25 percent) are in the inundation areas. In addition, the following major roads may be at least partially inundated as a result of sea level rise:

- State Highway 1
- State Highway 92
- US Highway 101
- State Highway 82
- State Highway 109
- Interstate 380
Environment

The exposure and vulnerability of the environment may increase as a result of climate change impacts on the flood hazard. Changes in the timing and frequency of flood events may have broader ecosystem impacts that alter the ability of already stressed species to survive.
## Table 2-4: Future Land Use in the 6 Foot Sea Level Rise Inundation Area.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Agriculture/Resource</th>
<th>Commercial</th>
<th>Education</th>
<th>Industrial</th>
<th>Mixed Use</th>
<th>Water/Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area (Acres)</td>
<td>% of Total</td>
<td>Area (Acres)</td>
<td>% of Total</td>
<td>Area (Acres)</td>
<td>% of Total</td>
</tr>
<tr>
<td>Atherton</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Belmont</td>
<td>0.0</td>
<td>0.00%</td>
<td>4.1</td>
<td>1.73%</td>
<td>12.2</td>
<td>0.51%</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0.0</td>
<td>0.00%</td>
<td>12.2</td>
<td>0.11%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Burlingame</td>
<td>0.0</td>
<td>0.00%</td>
<td>186.5</td>
<td>11.70%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Colma</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Daly City</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>0.7</td>
<td>0.08%</td>
<td>3.3</td>
<td>0.40%</td>
<td>0.1</td>
<td>0.02%</td>
</tr>
<tr>
<td>Foster City</td>
<td>0.0</td>
<td>0.00%</td>
<td>432.8</td>
<td>3.42%</td>
<td>87.6</td>
<td>0.69%</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>0.0</td>
<td>0.00%</td>
<td>6.7</td>
<td>10.99%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>1,914.3</td>
<td>24.22%</td>
<td>2.8</td>
<td>0.03%</td>
<td>43.3</td>
<td>0.55%</td>
</tr>
<tr>
<td>Millbrae</td>
<td>0.0</td>
<td>0.00%</td>
<td>14.6</td>
<td>6.28%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Pacifica</td>
<td>0.0</td>
<td>0.00%</td>
<td>4.6</td>
<td>3.36%</td>
<td>0.1</td>
<td>0.07%</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Redwood City</td>
<td>0.0</td>
<td>0.00%</td>
<td>470.3</td>
<td>2.60%</td>
<td>70.0</td>
<td>0.39%</td>
</tr>
<tr>
<td>San Bruno</td>
<td>0.0</td>
<td>0.00%</td>
<td>4.0</td>
<td>3.94%</td>
<td>1.0</td>
<td>0.95%</td>
</tr>
<tr>
<td>San Carlos</td>
<td>0.0</td>
<td>0.00%</td>
<td>42.0</td>
<td>8.34%</td>
<td>9.4</td>
<td>1.87%</td>
</tr>
<tr>
<td>San Mateo</td>
<td>0.0</td>
<td>0.00%</td>
<td>379.8</td>
<td>7.26%</td>
<td>205.1</td>
<td>3.92%</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>0.0</td>
<td>0.00%</td>
<td>253.1</td>
<td>1.83%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Woodside</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>54.8</td>
<td>0.33%</td>
<td>12.7</td>
<td>0.08%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,969.7</strong></td>
<td><strong>2.21%</strong></td>
<td><strong>1,829.6</strong></td>
<td><strong>2.05%</strong></td>
<td><strong>417.8</strong></td>
<td><strong>0.47%</strong></td>
</tr>
<tr>
<td>Jurisdiction</td>
<td>Parks/ Open Space</td>
<td>Residential</td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------------</td>
<td>-------------</td>
<td>-------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td></td>
</tr>
<tr>
<td>AHERTON</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>BELMONT</td>
<td>22.5</td>
<td>9.45%</td>
<td>76.6</td>
<td>32.19%</td>
<td>237.9</td>
<td></td>
</tr>
<tr>
<td>BRISBANE</td>
<td>41.0</td>
<td>0.37%</td>
<td>0.0</td>
<td>0.00%</td>
<td>10,982.1</td>
<td></td>
</tr>
<tr>
<td>BURLINGAME</td>
<td>75.4</td>
<td>4.73%</td>
<td>29.3</td>
<td>1.84%</td>
<td>1,594.3</td>
<td></td>
</tr>
<tr>
<td>COLMA</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>DALY CITY</td>
<td>27.8</td>
<td>72.75%</td>
<td>0.0</td>
<td>0.00%</td>
<td>38.2</td>
<td></td>
</tr>
<tr>
<td>EAST PALO ALTO</td>
<td>254.5</td>
<td>30.80%</td>
<td>341.4</td>
<td>41.32%</td>
<td>826.1</td>
<td></td>
</tr>
<tr>
<td>FOSTER CITY</td>
<td>285.1</td>
<td>2.25%</td>
<td>1,553.9</td>
<td>12.27%</td>
<td>12,667.8</td>
<td></td>
</tr>
<tr>
<td>HALF MOON BAY</td>
<td>31.8</td>
<td>52.24%</td>
<td>0.0</td>
<td>0.00%</td>
<td>60.9</td>
<td></td>
</tr>
<tr>
<td>HILLSBOROUGH</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>MENLO PARK</td>
<td>272.6</td>
<td>3.45%</td>
<td>122.0</td>
<td>1.54%</td>
<td>7,904.1</td>
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<tr>
<td>MILLBRAE</td>
<td>50.4</td>
<td>21.75%</td>
<td>38.2</td>
<td>16.47%</td>
<td>231.8</td>
<td></td>
</tr>
<tr>
<td>PACIFICA</td>
<td>3.7</td>
<td>2.69%</td>
<td>4.5</td>
<td>3.28%</td>
<td>137.3</td>
<td></td>
</tr>
<tr>
<td>PORTOLA VALLEY</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>REDWOOD CITY</td>
<td>3,707.9</td>
<td>20.53%</td>
<td>751.6</td>
<td>4.16%</td>
<td>18,059.6</td>
<td></td>
</tr>
<tr>
<td>SAN BRUNO</td>
<td>3.5</td>
<td>3.44%</td>
<td>59.4</td>
<td>57.88%</td>
<td>102.6</td>
<td></td>
</tr>
<tr>
<td>SAN CARLOS</td>
<td>4.0</td>
<td>0.80%</td>
<td>36.3</td>
<td>7.21%</td>
<td>503.9</td>
<td></td>
</tr>
<tr>
<td>SAN MATEO</td>
<td>581.7</td>
<td>11.11%</td>
<td>1,665.4</td>
<td>31.81%</td>
<td>5,235.5</td>
<td></td>
</tr>
<tr>
<td>SOUTH SAN FRANCISCO</td>
<td>51.9</td>
<td>0.37%</td>
<td>3.3</td>
<td>0.02%</td>
<td>13,840.6</td>
<td></td>
</tr>
<tr>
<td>WOODSIDE</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>UNINCORPORATED</td>
<td>465.5</td>
<td>2.78%</td>
<td>13.8</td>
<td>0.08%</td>
<td>16,758.4</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,879.0</strong></td>
<td><strong>6.59%</strong></td>
<td><strong>4,695.7</strong></td>
<td><strong>5.27%</strong></td>
<td><strong>89,181.1</strong></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 2-5. CRITICAL FACILITIES WITHIN 6 FOOT SEA LEVEL RISE INUNDATION AREAS

<table>
<thead>
<tr>
<th>Location</th>
<th>Medical and Health Services</th>
<th>Emergency Services</th>
<th>Government</th>
<th>Utilities</th>
<th>Hazardous Materials</th>
<th>Community Economic Facilities</th>
<th>Other Assets</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Belmont</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Brisbane</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Burlingame</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Colma</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Daly City</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Foster City</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>2</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>4</td>
<td>10</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Millbrae</td>
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<td>2</td>
<td>2</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pacifica</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Redwood City</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>35</td>
<td>16</td>
<td>9</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>San Bruno</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>San Carlos</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>San Mateo</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>13</td>
<td>23</td>
<td>1</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>8</td>
<td>11</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Woodside</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unincorporated</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>33</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1</strong></td>
<td><strong>12</strong></td>
<td><strong>10</strong></td>
<td><strong>73</strong></td>
<td><strong>111</strong></td>
<td><strong>45</strong></td>
<td><strong>7</strong></td>
<td><strong>37</strong></td>
</tr>
</tbody>
</table>
2.9.1 Landslide

Impacts to Hazard
Climate change may alter storm patterns, increasing the probability of more frequent, intense storms with varying duration. Increase in global temperature is likely to affect the snowpack and its ability to hold and store water. Warming temperatures also could increase the occurrence and duration of droughts, which would increase the probability of wildfire, reducing the vegetation that helps to support steep slopes. All of these factors would increase the probability for landslides.

Population and Property
Population and property exposure and vulnerability would be unlikely to increase as a result of climate change impacts to the landslide hazard. Landslide events may occur more frequently, but the extent and location should be contained within mapped hazard areas.

Critical Facilities
Critical facility exposure and vulnerability would be unlikely to increase as a result of climate change impacts to the landslide hazard; however, critical facility owners and operators may experience more frequent disruption to service provision as a result of landslide hazards. For example, transportation systems may experience more frequent delays if slides blocking these systems occur more frequently.

Environment
Exposure and vulnerability of the environment would be unlikely to increase as a result of climate change, but more frequent slides in riverine systems may impair water quality and have negative impacts on already stressed species.

2.9.2 Severe Weather

Impacts to Hazard
Climate change presents a challenge for risk management associated with severe weather. The frequency of severe weather events has increased steadily over the last century. The number of weather-related disasters during the 1990s was four times that of the 1950s and cost 14 times as much in economic losses. Historical data show that the probability for severe weather events increases in a warmer climate.

This increase in average surface temperatures can also lead to more intense heat waves that can be exacerbated in urbanized areas by what is known as urban heat island effect. The evidence suggests that heat waves are already increasing, especially in western states. According to information on Cal-Adapt, extreme heat days are likely to increase from a historical average for 4 days annually in San Mateo County. This increase would be coupled with an increase in heat waves and warm nights.

Population and Property
Population and property exposure and vulnerability would be unlikely to increase as a direct result of climate change impacts to the severe weather hazard. Severe weather events may occur more frequently and...
intensely, but exposure and vulnerability will remain the same. Secondary impacts, such as the extent of localized flooding, may increase, thus affecting greater numbers of people and structures.

**Critical Facilities**

Critical facility exposure and vulnerability would be unlikely to increase as a result of climate change impacts to the severe weather hazard; however, critical facility owners and operators may experience more frequent disruption to service provision. For example, more frequent and intense storms may cause more frequent disruptions in power service.

**Environment**

Exposure and vulnerability of the environment would be unlikely to increase as a result of climate change impacts on the severe weather hazard; however, more frequent storms and heat events and more intense rainfall may place additional stressors on already stressed systems.

### 2.9.3 Tsunami

**Impacts to Hazard**

Impacts to the frequency of tsunami events resulting from climate change are unknown. Triggering events for tsunamis such as earthquakes or landslides may increase, and therefore the frequency of tsunamis may increase. Some researchers have also indicated that rapid sea level rise may stress faults, leading to underwater landslides that trigger tsunamis (Geology 2013).

Even if the frequency of tsunami events does not increase, tsunami impacts may reach farther into communities than previous events and modelling have indicated because of sea level rise.

**Population, Property, and Critical Facility**

Population, property, and critical facility exposure and vulnerability to the tsunami hazard may increase as a result of climate change related sea level rise. As sea levels rise, tsunami impact areas may reach into parts of the community that were previously believed to be outside of the tsunami risk area. This reach will depend on the size of the tsunami, the local topography, and the extent of sea level rise.

**Environment**

Exposure and vulnerability of the environment to tsunamis may be impacted by the effects of climate change. In particular, sea level rise could alter the shape of existing shoreline, putting different structures and ecosystems closer to the shoreline and potential tsunami impacts. These assets would not have the same protection to tsunamis due to a shorter time period to adapt. Additionally, ice crust melt could lead to a rise of the earth’s crust, especially at higher latitudes, causing more submarine landslides and a greater vulnerability to tsunamis.
2.9.4 Wildfire

**Impacts to Hazard**

Wildfire is controlled by climate variability, local topography, and human intervention. Climate change has the potential to affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot dry spells create the highest fire risk. Increased temperatures may intensify wildfire danger by warming and drying out vegetation. Additionally, changes in climate patterns may affect the distribution and perseverance of insect outbreaks that create dead trees (increase fuel). Forest susceptibility to wildfires changes when climate alters fuel loads and fuel moisture. Climate change also may increase winds that spread fires. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.

**Population, Property, and Critical Facilities**

According to the Cal-Adapt projections provided earlier in this chapter, wildfire risk in San Mateo County is not expected to increase dramatically. As a result, it is unlikely that exposure and vulnerability to the wildfire hazard would increase significantly.

**Environment**

It is possible that the exposure and vulnerability of the environment will be affected by impacts on wildfire risk from climate change. Natural fire regimes may change, resulting in more frequent or higher intensity burns. These impacts may alter the composition of the ecosystems in and around the planning area.
3.1 Hazard Description

3.1.1 Causes of Dam Failure

Dam failures can be catastrophic to human life and property downstream. Dam failures in the United States typically occur in one of four primary ways:

- Overtopping of the primary dam structure, which accounts for 34 percent of all dam failures, can occur due to inadequate spillway design, settlement of the dam crest, blockage of spillways, and other factors.
- Foundation defects due to differential settlement, slides, slope instability, uplift pressures, and foundation seepage can also cause dam failure. These account for 30 percent of all dam failures.
- Failure due to piping and seepage accounts for 20 percent of all failures. These are caused by internal erosion due to piping and seepage, erosion along hydraulic structures such as spillways, erosion due to animal burrows, and cracks in the dam structure.
- Failure due to problems with conduits and valves, typically caused by the piping of embankment material into conduits through joints or cracks, constitutes 10 percent of all failures.

The remaining 6 percent of dam failures stem from other miscellaneous causes. Many historical dam failures in the United States have been secondary results of other disasters—prominently earthquakes, landslides, extreme storms, massive snowmelt, equipment malfunction, structural damage, foundation failures, and sabotage.

The most likely disaster-related causes of dam failure in San Mateo County are earthquakes, excessive rainfall, and...
landsides. Poor construction, lack of maintenance and repair, and deficient operational procedures are preventable or correctable via a program of regular inspections. Terrorism and vandalism are serious concerns for which all operators of public facilities must plan; these threats are under continuous review by public safety agencies.

### 3.1.2 Regulatory Oversight

**National Dam Safety Act**

Potential for catastrophic flooding due to dam failures led to passage of the National Dam Safety Act (Public Law 92-367). The National Dam Safety Program (NDSP) requires a periodic engineering analysis of the majority of dams in the country; exceptions include (1) dams under jurisdiction of the Bureau of Reclamation, Tennessee Valley Authority, or International Boundary and Water Commission; (2) dams constructed pursuant to licenses issued under the Federal Power Act; and (3) dams which the Secretary of the Army determines do not pose any threat to human life or property. The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect lives and property of the public. The NDSP is a partnership among the states, federal agencies, and other stakeholders that encourages individual and community responsibility for dam safety. Under FEMA’s leadership, state assistance funds have allowed all participating states to improve their programs through increased inspections, emergency action planning, and purchases of needed equipment. FEMA has also expanded existing and initiated new training programs. Grant assistance from FEMA provides support for improvement of dam safety programs that regulate most of the dams in the United States (FEMA 2013).

**California Division of Safety of Dams**

California’s Division of Safety of Dams (a division of the Department of Water Resources [DWR]) monitors the dam maintenance and safety at the state level. When a new dam is proposed, Division engineers and geologists inspect the site and the subsurface. Upon submittal of an application, the Division reviews the plans and specifications prepared by the owner to ensure that the dam is designed to meet minimum requirements and that the design is appropriate for the known geologic conditions. After approval of the application, the Division inspects all aspects of the construction to ensure that the work accords with the approved plans and specifications. After construction, the Division inspects each dam annually to ensure performance as intended and to identify developing problems. Roughly a third of these inspections include in-depth reviews of instrumentation. Finally, the Division periodically reviews stability of dams and their major appurtenances in light of improved design approaches, requirements, and new findings regarding earthquake hazards and hydrologic estimates in California (DWR Website 2007).

**U.S. Army Corps of Engineers Dam Safety Program**

The U.S. Army Corps of Engineers (USACE) is responsible for safety inspections of some federal and non-federal dams in the United States that meet size and storage limitations specified in the National Dam Safety Act. USACE has inventoried dams; surveyed each state and federal agency’s capabilities, practices, and regulations regarding design, construction, operation, and maintenance of dams; and developed guidelines for inspection and evaluation of dam safety (USACE 1997). The USACE National Inventory of Dams (NID) provides the most recent inspection dates for 24 of the San Mateo County dams. These are as follows:
TABLE 3-1. SAN MATEO COUNTY DAM INSPECTION DATES

<table>
<thead>
<tr>
<th>San Mateo County Dam</th>
<th>Inspection Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bean Hollow #1</td>
<td>April 24, 2012</td>
</tr>
<tr>
<td>Bean Hollow #3</td>
<td>April 24, 2012</td>
</tr>
<tr>
<td>Bear Gulch</td>
<td>March 23, 2012</td>
</tr>
<tr>
<td>Canada Road</td>
<td>March 22, 2012</td>
</tr>
<tr>
<td>Coastways</td>
<td>January 5, 2012</td>
</tr>
<tr>
<td>Crocker</td>
<td>August 10, 2010</td>
</tr>
<tr>
<td>Emerald Lake 1 Lower</td>
<td>January 4, 2012</td>
</tr>
<tr>
<td>Green Oaks #1</td>
<td>January 18, 2012</td>
</tr>
<tr>
<td>Johnston</td>
<td>March 22, 2012</td>
</tr>
<tr>
<td>Laurel Creek</td>
<td>January 4, 2012</td>
</tr>
<tr>
<td>Lower Crystal Springs</td>
<td>January 25, 2012</td>
</tr>
<tr>
<td>Lower Pond</td>
<td>May 11, 2012</td>
</tr>
<tr>
<td>Lake Lucerne</td>
<td>April 24, 2012</td>
</tr>
<tr>
<td>Marina Lagoon</td>
<td>January 4, 2012</td>
</tr>
<tr>
<td>Mud Pond</td>
<td>June 24, 2011</td>
</tr>
<tr>
<td>Notre Dame</td>
<td>January 25, 2012</td>
</tr>
<tr>
<td>Pilarcitos</td>
<td>January 25, 2012</td>
</tr>
<tr>
<td>Pomponio Ranch</td>
<td>January 8, 2012</td>
</tr>
<tr>
<td>Purisima</td>
<td>March 22, 2012</td>
</tr>
<tr>
<td>Rickey</td>
<td>January 25, 2012</td>
</tr>
<tr>
<td>San Andreas</td>
<td>January 25, 2012</td>
</tr>
<tr>
<td>Searsville</td>
<td>July 13, 2012</td>
</tr>
<tr>
<td>Spencer Lake</td>
<td>March 22, 2012</td>
</tr>
<tr>
<td>Upper Pond</td>
<td>May 11, 2012</td>
</tr>
</tbody>
</table>

Federal Energy Regulatory Commission Dam Safety Program

The Federal Energy Regulatory Commission (FERC) has the largest dam safety program in the United States. FERC cooperates with a large number of federal and state agencies to ensure and promote dam safety and, more recently, homeland security. Approximately 3,036 dams that are part of regulated hydroelectric projects are in the FERC program. Two-thirds of these dams are more than 50 years old. As dams age, concern about their safety and integrity grows, and oversight and a regular inspection program are extremely important. FERC staff inspects hydroelectric projects on an unscheduled basis to investigate the following:

- Potential dam safety problems
- Complaints about constructing and operating a project
- Safety concerns related to natural disasters
- Issues concerning compliance with terms and conditions of a license.
Every 5 years, an independent consulting engineer, approved by FERC, must inspect and evaluate projects with dams higher than 32.8 feet, or with a total storage capacity of more than 2,000 acre-feet.

FERC staff monitor and evaluate seismic research in geographic areas such as California where concerns about possible seismic activity are significant. This information is applied during investigations and structural analyses of hydroelectric projects in these areas. FERC staff also evaluate effects of potential and actual large floods on safety of dams. During and following floods, FERC staff visit dams and licensed projects, determine extent of damage, if any, and direct any necessary studies or remedial measures the licensee must undertake. The FERC publication *Engineering Guidelines for the Evaluation of Hydropower Projects* guides FERC engineering staff and licensees in evaluating dam safety. The publication is frequently revised to reflect current information and methodologies.

FERC requires licensees to prepare emergency action plans, and conducts training sessions on how to develop and test these plans. The plans outline an early warning system pertaining to actual or potential sudden release of water from a dam due to failure or accident. The plans include operational procedures that may be applied, such as reducing reservoir levels and downstream flows, or notifying affected residents and agencies responsible for emergency management. Updates and tests of these plans occur frequently to ensure that everyone knows what to do in emergency situations (FERC 2005).

### 3.2 Hazard Profile

#### 3.2.1 Past Events

Even under normal operating conditions, dam failures can occur suddenly, without warning (referred to as a “sunny-day” failure). Dam failures may also occur during a large storm event. Significant rainfall can quickly inundate an area and cause floodwaters to overwhelm a reservoir. If the spillway of the dam cannot safely pass the resulting flows, water will begin flowing in areas not designed for such flows, and a failure may occur.

No dam failures have been recorded in San Mateo County or the Bay Area. If a dam is determined unsafe, the California Department of Water Resources Division of Safety of Dams (DSOD) requires reduction of the water level to allow for partial collapse without catastrophic loss of water.

#### 3.2.2 Location

According to DSOD, 21 dams are in San Mateo County. Of these, 13 dams could endanger lives and property if an uncontrolled release or catastrophic failure occurs (including one dam in Santa Clara County, on the border of San Mateo County). Eleven of these dams are of sufficient size and at locations that would endanger a significant number of people during a failure. Table 3-2 lists dams with potential to endanger lives and property in the County.
### TABLE 3.2. SAN MATEO COUNTY DAMS WITH POTENTIAL TO ENDANGER LIVES AND PROPERTY

<table>
<thead>
<tr>
<th>Name</th>
<th>National ID#</th>
<th>Water Course</th>
<th>Owner</th>
<th>Year Built</th>
<th>Dam Type</th>
<th>Crest Length (feet)</th>
<th>Height (feet)</th>
<th>Storage Capacity (acre-feet)</th>
<th>Drainage area (sq. mi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bear Gulch</td>
<td>CA00658</td>
<td>Tributary, San Francisco Bay</td>
<td>Cal Water Svc</td>
<td>1896</td>
<td>Earth</td>
<td>730</td>
<td>61</td>
<td>672</td>
<td>0.2</td>
</tr>
<tr>
<td>Spencer Lake</td>
<td>CA00673</td>
<td>Tributary, San Francisco Bay</td>
<td>Hillsborough</td>
<td>1876</td>
<td>Earth</td>
<td>400</td>
<td>87</td>
<td>73</td>
<td>0.2</td>
</tr>
<tr>
<td>Crocker</td>
<td>CA00672</td>
<td>Sanchez Creek</td>
<td>Hillsborough</td>
<td>1890</td>
<td>Earth</td>
<td>200</td>
<td>45</td>
<td>22</td>
<td>0.26</td>
</tr>
<tr>
<td>Lower Crystal Spring</td>
<td>CA00127</td>
<td>San Mateo Creek</td>
<td>SF PUC Water Department</td>
<td>1888</td>
<td>Gravity</td>
<td>600</td>
<td>140</td>
<td>57,910</td>
<td>28.71</td>
</tr>
<tr>
<td>Emerald Lake</td>
<td>CA00668</td>
<td>Lower Emerald Lake</td>
<td>Emerald Lake CC</td>
<td>1885</td>
<td>Earth</td>
<td>280</td>
<td>57</td>
<td>45</td>
<td>0.25</td>
</tr>
<tr>
<td>Felt Lake^a</td>
<td>CA00670</td>
<td>Tributary, Los Trancos Creek</td>
<td>Stanford University</td>
<td>1930</td>
<td>Earth</td>
<td>590</td>
<td>67</td>
<td>900</td>
<td>0.2</td>
</tr>
<tr>
<td>Johnston</td>
<td>CA00667</td>
<td>Arroyo Leon</td>
<td>Peninsula Open Space Trust</td>
<td>1919</td>
<td>Gravity</td>
<td>132</td>
<td>31</td>
<td>30</td>
<td>7.6</td>
</tr>
<tr>
<td>Laurel</td>
<td>CA00901</td>
<td>Laurel Creek</td>
<td>San Mateo</td>
<td>1969</td>
<td>Earth</td>
<td>287</td>
<td>40</td>
<td>55</td>
<td>0.9</td>
</tr>
<tr>
<td>Notre Dame</td>
<td>CA00674</td>
<td>Belmont Creek</td>
<td>Belmont</td>
<td>b</td>
<td>Earth</td>
<td>210</td>
<td>51</td>
<td>120</td>
<td>0.53</td>
</tr>
<tr>
<td>Pilarcitos</td>
<td>CA00128</td>
<td>Pilarcitos Creek</td>
<td>SF PUC Water Department</td>
<td>1866</td>
<td>Earth</td>
<td>520</td>
<td>103</td>
<td>3,100</td>
<td>3.8</td>
</tr>
<tr>
<td>Rickey/West</td>
<td>CA01009</td>
<td>Peters Creek</td>
<td>Mid-Peninsula Open Space District</td>
<td>1951</td>
<td>Earth</td>
<td>200</td>
<td>64</td>
<td>47</td>
<td>0.23</td>
</tr>
<tr>
<td>San Andreas</td>
<td>CA00129</td>
<td>Tributary, San Mateo Creek</td>
<td>SF PUC Water Department</td>
<td>1870</td>
<td>Earth</td>
<td>727</td>
<td>107</td>
<td>19,027</td>
<td>4.4</td>
</tr>
<tr>
<td>Searsville</td>
<td>CA00669</td>
<td>Corte Madera Creek</td>
<td>Stanford University</td>
<td>1890</td>
<td>Gravity</td>
<td>260</td>
<td>68</td>
<td>952</td>
<td>14.8</td>
</tr>
</tbody>
</table>

---

a. Felt Lake is within Santa Clara County, approximately 1,300 feet from San Mateo boundary lines. It has been included here due to its proximity to the County.
b. Year built unavailable.

Sources: San Mateo County Sheriff 2015; USACE NID 2016; DSOD 2016
The Lower Crystal Springs Dam is the largest dam within San Mateo County, making it a higher priority for county, state, and federal officials in regards to regulation and preventative maintenance. This dam impounds water to form the Lower Crystal Springs Reservoir, which serves as a water supply for San Francisco and most cities in San Mateo County. Although located directly on the San Andreas Fault, the dam survived both the 1906 San Francisco earthquake and 1989 Loma Prieta earthquake. In 2010, DSOD inspected the Lower Crystal Springs Dam to investigate effects of an 8.3 magnitude earthquake (on the Richter scale), and determined dam failure to be a low probability. Despite this low probability, the County and dam owner, San Francisco Public Utilities Commission (SFPUC), are dedicated to enhancing safety and quality of the dam. Significant upgrades to the dam and a nearby overpass bridge occurred between fall 2010 and spring 2015 to restore maximum storage capacity of the reservoir. The project involved widening the spillway, raising the parapet wall, and replacing the stilling basin with a new and larger facility (San Mateo County Sheriff 2015).

3.2.3 Frequency

Dam failure events are infrequent and usually coincide with the events causing them, such as earthquakes, landslides, or excessive rainfall and snowmelt. Dams pose “residual risk”—risk remaining after implementation of safeguards. Residual risk is associated with events beyond those the dam was designed to withstand. However, probability of occurrence of any type of dam failure event is considered low in today’s regulatory and dam safety oversight environment.

3.2.4 Severity

Dam failure can be catastrophic to all life and property downstream. Measure of extent or severity of a dam failure is through the classification of the dam. Moreover, two additional factors influence potential severity of a full or partial dam failure: (1) amount of water impounded, and (2) downstream development and infrastructure (density, type, and value) (City of Sacramento Development Service Department 2005). Several classification tools are available to identify the hazards of a dam. For the purpose of this hazard profile and Hazard Mitigation Plan (HMP) Update, the USACE hazard classification will be used. USACE developed the classification system presented in Table 3-3. This hazard rating system is based only on potential consequences of a dam failure; it does not take into account probability of such failures.

<table>
<thead>
<tr>
<th>Hazard Category&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Direct Loss of Life&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Lifeline Losses&lt;sup&gt;c&lt;/sup&gt;</th>
<th>Property Losses&lt;sup&gt;d&lt;/sup&gt;</th>
<th>Environmental Losses&lt;sup&gt;e&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>None (rural location, no permanent structures for human habitation)</td>
<td>No disruption of services (cosmetic or rapidly repairable damage)</td>
<td>Private agricultural lands, equipment, and isolated buildings</td>
<td>Minimal incremental damage</td>
</tr>
<tr>
<td>Significant</td>
<td>Rural location, only transient or day-use facilities</td>
<td>Disruption of essential facilities and access</td>
<td>Major public and private facilities</td>
<td>Major mitigation required</td>
</tr>
<tr>
<td>High</td>
<td>Certain (one or more) extensive residential, commercial, or industrial development</td>
<td>Disruption of essential facilities and access</td>
<td>Extensive public and private facilities</td>
<td>Extensive mitigation cost or impossible to mitigate</td>
</tr>
</tbody>
</table>

a. Categories are assigned to overall projects, not individual structures at a project.
b. Loss of life potential based on inundation mapping of area downstream of the project. Analyses of loss of life potential should take into account the population at risk, time of flood wave travel, and warning time.

c. Indirect threats to life caused by interruption of lifeline services due to project failure or operational disruption—for example, loss of critical medical facilities or access to these.

d. Damage to project facilities and downstream property and indirect impact due to loss of project services, such as impact due to loss of a dam and navigation pool, or impact due to loss of water or power supply.

e. Environmental impact downstream caused by the incremental flood wave produced by project failure, beyond what would normally be expected for the magnitude flood event under which the failure occurs.

Source: USACE 1995

3.2.5 Warning Time

Warning time for dam failure varies depending on the cause of the failure. Evacuations prior to events of extreme precipitation or massive snowmelt can be planned given sufficient time. A structural failure due to earthquake, however, possibly would allow no warning time. A dam’s structural type also affects warning time. Earthen dams do not tend to fail completely or instantaneously. Once a breach is initiated, discharging water erodes the breach until either the reservoir water is depleted or the breach resists further erosion. Concrete gravity dams also tend to have partial breaches as one or more monolith sections formed during dam construction are forced apart by escaping water. Time for breach formation ranges from a few minutes to a few hours (USACE 1997).

San Mateo County and its planning partners have established protocols for emergency warning and response through its adopted emergency operations plan (EOP). The San Mateo County Sheriff’s Office of Emergency Services maintains copies of the most recent dam emergency action plans (EAP) and inundation maps, and it has used this information to plan notification needs for downstream areas in the event of a failure (San Mateo County Sheriff 2015).

3.3 Secondary Hazards

Dam failure can cause severe downstream flooding depending on magnitude of the failure. Other potential secondary hazards of dam failure include landslides around the reservoir perimeter, bank erosion on the rivers, and destruction of downstream habitat.

3.4 Exposure

Exposure and vulnerability to dam failure hazard was assessed by use of spatial analysis. Dam inundation areas for which inundation mapping was available were combined into a single inundation area and overlaid with planning area features including general building stock and critical facility databases. Dams included in the combined inundation area were Bear Gulch, Emerald Lake, Felt Lake, Laurel Creek, Lower Crystal Springs, Pilarcitos, Ricky Dam, San Andreas, and Searsville. Although simultaneous failure of all dams is highly unlikely, the assessment provides information adequate for planning purposes. However, this assessment may not capture risk posed by all dams in the County.

3.4.1 Population

All populations within a dam failure inundation zone would be exposed to the risk of a dam failure. Potential for loss of life is affected by capacity and number of evacuation routes available to populations living within
areas of potential inundation. Estimated population living within the mapped inundation areas is 116,451, or 15.5 percent of the County’s population. Table 3-4 lists population exposure estimates by jurisdiction.

<table>
<thead>
<tr>
<th>Table 3-4. Population within Dam Failure Inundation Areasb</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population Exposeda</strong></td>
</tr>
<tr>
<td>Atherton</td>
</tr>
<tr>
<td>Belmont</td>
</tr>
<tr>
<td>Brisbane</td>
</tr>
<tr>
<td>Burlingame</td>
</tr>
<tr>
<td>Colma</td>
</tr>
<tr>
<td>Daly City</td>
</tr>
<tr>
<td>East Palo Alto</td>
</tr>
<tr>
<td>Foster City</td>
</tr>
<tr>
<td>Half Moon Bay</td>
</tr>
<tr>
<td>Hillsborough</td>
</tr>
<tr>
<td>Menlo Park</td>
</tr>
<tr>
<td>Millbrae</td>
</tr>
<tr>
<td>Pacifica</td>
</tr>
<tr>
<td>Portola Valley</td>
</tr>
<tr>
<td>Redwood City</td>
</tr>
<tr>
<td>San Bruno</td>
</tr>
<tr>
<td>San Carlos</td>
</tr>
<tr>
<td>San Mateo</td>
</tr>
<tr>
<td>South San Francisco</td>
</tr>
<tr>
<td>Woodside</td>
</tr>
<tr>
<td>Unincorporated</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

a. Determined by percent of total residential buildings exposed multiplied by estimated 2015 population.

b. These estimates are derived from the planning scenario event, not for all possible dam failure risk in the County.

3.4.2 Property

Table 3-5 summarizes values of planning area buildings within the mapped inundation area. More than 14 percent of total replacement value within the planning area is exposed to the dam failure hazard. Table 3-6 lists structure types of buildings within the inundation areas and also represents the distribution of land uses within the dam inundation area.
### Table 3-5. Value of Structures in Dam Failure Inundation Area\(^b\)

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Building</th>
<th>Contents</th>
<th>Total</th>
<th>Replacement Value(^a)</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>$244,788,197</td>
<td>$202,129,464</td>
<td>$446,917,661</td>
<td></td>
<td>11.5%</td>
</tr>
<tr>
<td>Belmont</td>
<td>$308,456,306</td>
<td>$220,868,233</td>
<td>$529,324,539</td>
<td></td>
<td>5.1%</td>
</tr>
<tr>
<td>Brisbane</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td></td>
<td>0.0%</td>
</tr>
<tr>
<td>Burlingame</td>
<td>$111,558,338</td>
<td>$81,598,480</td>
<td>$193,156,818</td>
<td></td>
<td>0.9%</td>
</tr>
<tr>
<td>Colma</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td></td>
<td>0.0%</td>
</tr>
<tr>
<td>Daly City</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td></td>
<td>0.0%</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>$8,273,294</td>
<td>$6,158,767</td>
<td>$14,432,060</td>
<td></td>
<td>0.2%</td>
</tr>
<tr>
<td>Foster City</td>
<td>$4,859,871,460</td>
<td>$3,359,006,796</td>
<td>$8,218,878,256</td>
<td></td>
<td>100.0%</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>$440,474,259</td>
<td>$243,136,791</td>
<td>$683,611,040</td>
<td></td>
<td>11.0%</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>$370,525,354</td>
<td>$243,136,791</td>
<td>$613,662,145</td>
<td></td>
<td>13.1%</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>$575,971,438</td>
<td>$389,075,302</td>
<td>$965,046,740</td>
<td></td>
<td>5.2%</td>
</tr>
<tr>
<td>Millbrae</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td></td>
<td>0.0%</td>
</tr>
<tr>
<td>Pacifica</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td></td>
<td>0.0%</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td></td>
<td>0.0%</td>
</tr>
<tr>
<td>Redwood City</td>
<td>$1,904,626,976</td>
<td>$1,575,450,944</td>
<td>$3,480,077,920</td>
<td></td>
<td>9.7%</td>
</tr>
<tr>
<td>San Bruno</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td></td>
<td>0.0%</td>
</tr>
<tr>
<td>San Carlos</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td></td>
<td>0.0%</td>
</tr>
<tr>
<td>San Mateo</td>
<td>$16,236,106,569</td>
<td>$13,261,869,886</td>
<td>$29,497,976,455</td>
<td></td>
<td>68.1%</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td></td>
<td>0.0%</td>
</tr>
<tr>
<td>Woodside</td>
<td>$2,442,452</td>
<td>$1,221,226</td>
<td>$3,663,677</td>
<td></td>
<td>0.1%</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>$363,502,223</td>
<td>$314,421,833</td>
<td>$677,924,056</td>
<td></td>
<td>2.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$25,426,596,866</strong></td>
<td><strong>$20,075,135,168</strong></td>
<td><strong>$45,501,732,033</strong></td>
<td></td>
<td><strong>14.2%</strong></td>
</tr>
</tbody>
</table>

\(a\) Percentages are based on total replacement value for individual jurisdictions, not for the planning area as a whole. The “total” percentage shown is based on the sum of replacement values for jurisdictions in this table.

\(b\) These estimates are derived from the planning scenario event, not for all possible dam failure risk in the County.

**Note:** Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

---

### Table 3-6. Present Land Use in Dam Failure Inundation Areas

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Agriculture/Forestry</th>
<th>Religion</th>
<th>Government</th>
<th>Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>119</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>127</td>
</tr>
<tr>
<td>Belmont</td>
<td>497</td>
<td>8</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>508</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Burlingame</td>
<td>258</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>268</td>
</tr>
<tr>
<td>Colma</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Daly City</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
TABLE 3-6. PRESENT LAND USE IN DAM FAILURE INUNDATION AREAS

<table>
<thead>
<tr>
<th>Number of Structuresa,b</th>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Agriculture/Forestry</th>
<th>Religion</th>
<th>Government</th>
<th>Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Palo Alto</td>
<td>22</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>Foster City</td>
<td>8,750</td>
<td>118</td>
<td>22</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>7</td>
<td>8,905</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>140</td>
<td>34</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>176</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>419</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>426</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>936</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>954</td>
</tr>
<tr>
<td>Millbrae</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pacifica</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Redwood City</td>
<td>1,975</td>
<td>92</td>
<td>2</td>
<td>0</td>
<td>9</td>
<td>0</td>
<td>6</td>
<td>2,084</td>
</tr>
<tr>
<td>San Bruno</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>San Carlos</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>San Mateo</td>
<td>17,485</td>
<td>803</td>
<td>87</td>
<td>1</td>
<td>30</td>
<td>3</td>
<td>18</td>
<td>18,427</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Woodside</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>326</td>
<td>14</td>
<td>0</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>352</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30,932</strong></td>
<td><strong>1,105</strong></td>
<td><strong>114</strong></td>
<td><strong>14</strong></td>
<td><strong>50</strong></td>
<td><strong>3</strong></td>
<td><strong>37</strong></td>
<td><strong>32,255</strong></td>
</tr>
</tbody>
</table>

a. Present land use information in this plan is for planning purposes only. Discrepancies may exist between these estimates and official records maintained by participating jurisdictions.

b. These estimates are derived from the planning scenario event, not for all possible dam failure risk in the County.

Geographic Information System (GIS) analysis was applied to determine the number of critical facilities within the mapped dam inundation areas. As Table 3-7 indicates, 155 of the planning area’s critical facilities are within the inundation areas. In addition, the following major roads are exposed to the dam failure hazard:

- State Highway 1 (Pacific Coast Highway)
- State Highway 82 (El Camino Real)
- State Highway 84 (Woodside Road)
- State Highway 92
- State Highway 109 (University Avenue, East Palo Alto)
- State Highway 114 (Willow Road, Menlo Park)
- US Highway 101
- Interstate 380
- State Highway 109 (University Avenue, East Palo Alto)

Additional critical facilities and infrastructure are likely present within inundation areas for which mapping was not available.
### Table 3-7. Critical Facilities in Dam Failure Inundation Areas in San Mateo County

<table>
<thead>
<tr>
<th></th>
<th>Medical and Health Services</th>
<th>Emergency Services</th>
<th>Government</th>
<th>Utilities</th>
<th>Transportation Infrastructure</th>
<th>Hazardous Materials</th>
<th>Community Economic Facilities</th>
<th>Other Assets</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Belmont</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Burlingame</td>
<td>0</td>
<td>0</td>
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<td><strong>4</strong></td>
<td><strong>35</strong></td>
<td><strong>155</strong></td>
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</tbody>
</table>

#### 3.4.3 Environment

Reservoirs held behind dams affect many ecological aspects of a river. River topography and dynamics depend on a wide range of flows, but rivers below dams often undergo long periods of very stable flow conditions or saw-tooth flow patterns caused by releases followed by no releases. Water releases from a reservoir, including those exiting a turbine, usually contain very little suspended sediment; this can lead to scouring of river beds and loss of riverbanks.

The environment would be exposed to a number of risks in the event of dam failure. The inundation could introduce many foreign elements into local waterways, possibly destroying downstream habitat and exerting detrimental effects on many species of animals.
3.5 Vulnerability

The dam failure hazard is significant to San Mateo County because of presence of more than 20 dams across the County, including more than 10 higher hazard dams (13 dams were identified by San Mateo County Sheriff’s Office as having potential to endanger lives and property; however, the County did not note whether this hazard classification corresponds to USACE hazard classes or is unique to San Mateo County). Direct and indirect losses associated with dam failures include injury and loss of life, damage to structures and infrastructure, agricultural losses, utility failure (power outages), and stress on community resources.

3.5.1 Population

The entire population residing within a dam failure inundation zone is considered exposed and vulnerable. Of the population exposed, the most vulnerable include the economically disadvantaged and the population over age 65. Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on net economic impact on their families. The population over age 65 is also highly vulnerable because they are more likely to seek or need medical attention that may not be available because of isolation during a flood event, and they may have more difficulty evacuating. The vulnerable population also includes those who would not have adequate warning from a television or radio emergency warning system.

3.5.2 Property

Vulnerable properties are those closest to the dam inundation area. These properties would undergo the largest, most destructive surge of water. Low-lying areas are also vulnerable because dam waters would collect there.

Loss estimates were not generated for the dam failure hazard by use of Hazus-MH. Instead, loss potentials were developed representing 10 percent, 30 percent, and 50 percent of replacement value of exposed structures. This allows emergency managers to select a range of economic impact based on an estimate of percent of damage to general building stock. Damage exceeding 50 percent is considered substantial by most building codes, and typically requires total reconstruction of the structure. Table 3-8 lists general building stock loss estimates within dam failure inundation areas. That all dams included in the inundation mapping would fail at the same time is highly unlikely.

| Table 3-8. Value of Structures and Contents in Dam Failure Inundation Area |
|-----------------------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Exposed Value | 10% Damage | 30% Damage | 50% Damage |
| Atherton | $446,917,661 | $44,691,766 | $134,075,298 | $223,458,831 |
| Belmont | $529,324,539 | $52,932,454 | $158,797,362 | $264,662,269 |
| Brisbane | $0 | $0 | $0 | $0 |
| Burlingame | $193,156,818 | $19,315,682 | $57,947,045 | $96,578,409 |
| Colma | $0 | $0 | $0 | $0 |
| Daly City | $0 | $0 | $0 | $0 |
### Table 3-8. Value of Structures and Contents in Dam Failure Inundation Area\(^a\)

<table>
<thead>
<tr>
<th>Location</th>
<th>Exposed Value</th>
<th>10% Damage</th>
<th>30% Damage</th>
<th>50% Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Palo Alto</td>
<td>$14,432,060</td>
<td>$1,443,206</td>
<td>$4,329,618</td>
<td>$7,216,030</td>
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<tr>
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<td>$8,218,878,256</td>
<td>$821,887,826</td>
<td>$2,465,663,477</td>
<td>$4,109,439,128</td>
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<tr>
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<td>$86,067,171</td>
<td>$258,201,512</td>
<td>$430,335,853</td>
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<td>$61,366,215</td>
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<td>$96,504,674</td>
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<td>$482,523,370</td>
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<td>$0</td>
<td>$0</td>
</tr>
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<td>Pacifica</td>
<td>$0</td>
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<td>$0</td>
<td>$0</td>
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<td>Portola Valley</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Redwood City</td>
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<tr>
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<tr>
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<td><strong>Total</strong></td>
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<td><strong>$4,550,173,203</strong></td>
<td><strong>$13,650,519,610</strong></td>
<td><strong>$22,750,866,017</strong></td>
</tr>
</tbody>
</table>

\(^a\) These estimates are derived from the planning scenario event, not for all possible dam failure risk in the County.

### Note:
Values are accurate only for comparison among results in this plan. See Section 2, Chapter 1 of this volume for a discussion of data limitations.

#### 3.5.3 Critical Facilities

All critical facilities within dam inundation areas are vulnerable to the dam failure hazard. Transportation routes—including all roads, railroads, and bridges in the path of a dam inundation—are vulnerable and could be wiped out, creating isolation issues. Critical facilities most vulnerable are those already in poor condition and thus not able to withstand a large water surge. Utilities such as overhead power lines, cable, and phone lines could also be vulnerable. Loss of these utilities could create additional isolation issues within the inundation areas.

#### 3.5.4 Environment

Dam failure poses a number of risks to the environment. The inundation could introduce foreign elements into local waterways, resulting in destruction of downstream habitat and detrimental effects on many species of animals. Releases of hazardous materials pose the most significant threat to the environment within an inundation area. Fixed site facilities within the inundation area may contain highly flammable or highly toxic materials, and tanks may rupture, releasing the material into the environment. Depending on characteristics of a hazardous material, affected environments may take years to recover.

Extent of vulnerability of the environment is the same as exposure of the environment.
3.5.5 Economic Impact

Dam failure can cause severe downstream flooding and may transport large volumes of sediment and debris, depending on the magnitude of the event, resulting in direct repair costs for the County or associated jurisdictions to manage the debris. Widespread damage to buildings and infrastructure affected by an event would require large monetary expenditures for repair of those. Beyond costs stemming from physical damage, closures of businesses may be necessary while flood waters retreat and the area awaits resumption of utilities services.

3.6 Future Trends in Development

Land use within the planning area will conform to general plans adopted under California’s General Planning Law. The safety elements of these general plans establish standards and plans for protection of the community from hazards. Dam failure is currently addressed as part of the flooding hazard in jurisdictional safety elements. Municipal planning partners have established comprehensive policies regarding sound land use within identified flood hazard areas. Flood-related policies in the general plans will help reduce risk associated with the dam failure hazard to all future development within the planning area.
### Table 3-9. Dam Failure Future Land Use

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<thead>
<tr>
<th>Jurisdiction</th>
<th>Agriculture/Resource Extraction</th>
<th>Commercial</th>
<th>Education</th>
<th>Industrial</th>
<th>Mixed Use</th>
<th>Other/Unknown</th>
<th>Parks/Open Space</th>
<th>Residential</th>
<th>Water</th>
<th>Total</th>
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</thead>
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<td></td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
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<td>0.0%</td>
<td>0.0</td>
<td>0.0%</td>
</tr>
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<td>0.0%</td>
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<tr>
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<tr>
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<td>0.00%</td>
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<td>560.9</td>
<td>4.83%</td>
<td>79.6</td>
<td>0.69%</td>
<td>626.5</td>
<td>5.40%</td>
</tr>
</tbody>
</table>
3.7 Scenario

An earthquake in the region could lead to liquefaction of soils around a dam, without warning during any time of the day. A human-caused incident such as a terrorist attack also could trigger a catastrophic failure of a dam that would impact the planning area. Failure of a high hazard dam in the County would likely result in losses of life, roadways, structures, and property, and exert severe impacts on the local economy. While the possibility of failure is remote, results would be devastating. The worst-case scenario would involve failure of the Lower Crystal Springs Dam. In addition to severe property damage and potential injuries, loss of water from the Crystal Springs Reservoir could lead to reduction in available potable water for the County and Bay Area. Coupled with the ongoing drought throughout the State and already low water supply availability, this damage could lead to significant water shortages.

While probability of dam failure is very low, probability of flooding associated with changes in dam operational parameters in response to climate change is higher. Dam designs and operations are developed based on hydrographs from historical records. If these hydrographs change significantly over time due to effects of climate change, current dam designs and operations may no longer be valid. Specified release rates and impound thresholds may have to be changed, which could result in increased discharges downstream of these facilities, thus increasing probability and severity of flooding.

3.8 Issues

The most significant issues associated with dam failure involve properties and populations within inundation zones. Flooding as a result of a dam failure would significantly impact these areas. Warning time for dam failure plausibly would be limited. Moreover, dam failure is frequently associated with other natural hazard events such as earthquakes, landslides, or severe weather, which limits predictability of dam failure and compounds the hazard. Important issues associated with dam failure hazards are as follows:

- USACE NID and DSOD dam lists are inconsistent regarding the number of dams in San Mateo County. These lists should be evaluated and corrected where needed. Currently, NID lists 24 dams within the County, while DSOD has record of 21.
- Federally regulated dams are adequately overseen, and emergency action plans for public notification in the unlikely event of failures of these are sophisticated. However, protocols for notification of downstream citizens of imminent failure must be tied to local emergency response planning.
- Mapping for federally regulated dams is already required and available; however, mapping for non-federally regulated dams that estimates inundation depths is needed to better assess risks associated with failure of these dams. Moreover, although mapping is required for federally regulated dams, development downstream of dams and upgrades to older dams may have altered inundation areas; however, these inundation maps may not have been updated for significant periods of time. Encouraging property owners of dams to update EAPs and inundation maps will ensure availability of the most accurate data to assist emergency planners and local officials.
Most dam failure mapping required at federal levels requires determination of the probable maximum flood. While the probable maximum flood represents a worst-case scenario, it is generally the event with the lowest probability of occurrence. Mapping of dam failure scenarios for non-federal-regulated dams that are less extreme than the probable maximum flood, but have a higher probability of occurrence, can be valuable to emergency managers and community officials downstream of these facilities. This type of mapping can illustrate areas potentially impacted by more frequent events to support emergency response and preparedness actions.

The concept of residual risk associated with structural flood control projects should be considered in designs of capital projects and applications of land use regulations.

Addressing security concerns and the need to inform the public of risk associated with dam failure are challenges for public officials.

Limited financial resources for dam maintenance during economic downturns result in decreased attention to dam structure operational integrity, because available funding is often directed to more urgent needs. This could increase potential for maintenance failures.

Dam failure inundation areas are often not considered special flood hazard areas under the National Flood Insurance Program, so flood insurance coverage in these areas is not common.
Chapter 4.
Drought

4.1 General Background

Most of California’s precipitation comes from storms moving across the Pacific Ocean. The path followed by the storms is determined by the position of an atmospheric high pressure belt that normally shifts southward during the winter, allowing low pressure systems to move into the State. On average, 75 percent of California’s annual precipitation occurs between November and March, with 50 percent occurring between December and February. A persistent Pacific high pressure zone over California in mid-winter signals a tendency for a dry water year.

A typical water year produces about 100 inches of rainfall over the North Coast, 50 inches of precipitation (combination of rain and snow) over the Northern Sierra, 18 inches in the Sacramento area, and 15 inches in the Los Angeles area. In extremely dry years, these annual totals can fall to as little as one half, or even one third of these amounts.

Determination of when drought begins requires knowledge of drought impacts on water users, including supplies available to local water users and stored water available to them in surface reservoirs or groundwater basins. Different local water agencies have different criteria for defining drought conditions within their jurisdictions. Some agencies issue drought watch or drought warning announcements to their customers. Determinations of regional or statewide drought conditions are usually based on a combination of hydrologic and water supply factors (CA Department of Water Resources [DWR] 2016). The California water code does not include a statutory definition of drought; however, analysis of text in the code indicates that legal matters most frequently focus on drought conditions during times of water shortages (California Code of Regulations [CCR] 2016).

The Sierra Nevada snowpack serves as the primary agent for replenishing water in the San Francisco Bay area, including San Mateo County, and for much of the State of California. A reduction in spring snowpack runoff, whether due to drier winters or to increasing temperatures leading to more rain than snow, can increase risk of summer or fall water shortages throughout the region (City and County of San Francisco 2014).

4.1.1 Water Supply Strategy

San Mateo County receives approximately 92 percent of its water through the regional Hetch Hetchy Water System, with the remainder of the County’s water supply coming from surface, ground, and recycled water (San Mateo County Sheriff 2015). The water system was so-named because 85 percent of the water supply comes from the Sierra Nevada snowmelt stored in the Hetch Hetchy reservoir along the Tuolumne River in

DEFINITIONS
Drought—Cumulative impacts of several dry years on water users, which can include deficiencies in surface and subsurface water supplies, and effects on health, wellbeing, and quality of life.
Hydrological Drought—Deficiencies in surface and subsurface water supplies.
Socioeconomic Drought—Drought impacts on health, wellbeing, and quality of life.
Yosemite National Park; the remaining 15 percent of water comes from runoff in Alameda and Peninsula watersheds (Bay Area Water Supply Conservation Agency [BAWSCA] 2016)

BAWSCA is the main water provider for much of the Bay Area, allowing San Mateo County (through its cities), other jurisdictions, water districts, and private utilities to coordinate in order to ensure continual water supply necessary to maintain health, safety, and economic wellbeing of residents, businesses, and community organizations. BAWSCA agencies manage two-thirds of water consumption from the Hetch Hetchy Water System, providing water to 2.4 million people in San Francisco, Santa Clara, Alameda, and San Mateo Counties. In San Mateo County, BAWSCA services Brisbane, Burlingame, Daly City, East Palo Alto, Hillsborough, Menlo Park, Millbrae, Redwood City, San Bruno, Coastside County Water District, Estero Municipal Improvement District, Guadalupe Valley Municipal Improvement District, Mid-Peninsula Water District, Westborough Water District, and California Water Service Company (private utility) (BAWSCA 2016).

BAWSCA developed a reliable, two-phase, long-term water supply strategy for customers in San Mateo County and throughout the Bay Area. Purposes of this comprehensive strategy are as follows: (1) quantifying water supply reliability needs of BAWSCA member agencies through 2040, (2) identifying water supply management programs or programs that can be developed to meet those regional water reliability needs, and (3) developing an implementation plan for the water supply strategy.

This water supply strategy recognized that drought year shortfalls could be significant, although determining that normal year water supply would be adequate through at least 2014. Dry years could result in system-wide cutbacks of up to 20 percent, but 10 to 15 percent is the more consistent standard. BAWSCA also noted impacts of water shortages would be regional and could lead to secondary detrimental economic effects. To address this concern, BAWSCA focused on (1) identifying options for filling all or portions of the drought year supply shortfall, and (2) investigating and potentially implementing actions that seem most beneficial.

In addition to the Long-Term Reliable Water Supply Strategy, BAWSCA also developed a Water Conservation Implementation Plan (WCIP). The WCIP focuses on the following objectives:

- Assist BACSWA member agencies in evaluating potential water savings and cost-effectiveness associated with implementing additional water conservation measures, beyond their commitments in 2004.
- Determine potential water savings in 2018 and 2030 based on a selected range of new conservation measures and the 2004 water conservation commitments.
- Determine BAWSCA’s role in helping member agencies achieve individual water conservation goals.
- Develop a coordinated regional plan for water conservation implementation measures to serve as a guideline for member agencies (BAWSCA 2009).

While BAWSCA is the primary water service agent in the County, it is not the only option for residents and businesses. The County Public Works Department operates County Service Area (CSA) No. 7 and CSA No. 11. These service areas provide potable water to approximately 70 customers in the La Honda community and 90 customers in the Pescadero community, respectively. CSA 7 also supplies two County facilities—Camp Glenwood Boys Ranch and Sam McDonald Park (San Mateo County 2016).
Moreover, some County residents have domestic wells on their property. The South Central Regional Office of California DWR monitors wells for San Mateo County to help protect groundwater quality (CA DWR 2016). As of 2013, San Mateo County had 4,898 wells within its limits. Of these wells, 1,372 were for domestic use, 462 for irrigation, 36 for public supply, and the rest for monitoring, industrial, or other uses (CA DWR 2013).

4.1.2 Water Supply Infrastructure

The Hetch Hetchy Water System (source of much of the water consumed in the Bay Area) was approved in 1913 under the Raker Act, which allowed use of federal lands in the Sierra Nevada Mountains to build that water system. The water system was constructed by San Francisco over the next 20 years, with first delivery of water in 1934. Although the system is owned by San Francisco, it was designed from the beginning to serve as a regional water supply system (BAWSCA 2016). Figure 4-1 shows the Hetch Hetchy Water System.

![Figure 4-1. Hetch Hetchy Water System](image)

In May 2002, the San Francisco Public Utilities Commission (SFPUC) adopted a $2.9 billion capital improvement plan (CIP) to overhaul and enhance the water system. Need for such an overhaul had been recognized after the Loma Prieta earthquake in 1989 and drought in the 1990s. Much of the water supply system is 75 to 100 years old and does not meet modern seismic codes. Major pipelines cross earthquake faults, and the U.S. Geological Survey (USGS) has estimated a 63 percent probability of occurrence of an earthquake of magnitude 6.7 within the next 30 years. A 2000 SFPUC study found that a major earthquake could cripple the water supply system for up to 20-30 days or longer. SFPUC has highlighted nine priority projects in the CIP for implementation, completion of which should help ensure relative continuity of operations of the water supply system following a large seismic event (BAWSCA 2016).

San Mateo County maintains the infrastructure for CSA 7 and CSA 11, the two local water systems within its borders. CSA 7 includes an intake and pump in Alpine Creek, a water treatment plan, a 500,000-gallon storage tank, and a distribution system. The treatment plant was constructed in the early 1990s, but parts of the distribution system date back to the 1920s. CSA 11 was established in 1988 and consists of two wells, one...
135,000-gallon distribution tank, and a distribution system. Water flows from the distribution tank through the water system under force of gravity; no distribution pumps are required. CSA 11 was determined necessary after relatively high concentrations of nitrate and other naturally occurring salts were found in local groundwater sources, raising concern that continued use of previously utilized small domestic wells could lead to unintended health consequences (San Mateo County 2016).

4.1.3 Defined Drought Levels

Neither San Mateo County nor BAWSCA have defined “drought level.” County and regional drought response is determined case by case, and response priorities are typically based on imminence of potential water shortages. BAWSCA has developed both Tier 1 and Tier 2 Drought Implementation Plans (DRIP); however, these plans do not specify specific trigger levels. The Tier 1 DRIP is for SFPUC and BAWSCA, while the Tier 2 DRIP is for BAWSCA member agencies. The Tier 2 DRIP includes calculations to determine water allocations for member agencies during water shortages. Drought levels defined in the California Drought Contingency Plan (listed as follows) can serve as a reference for County and stakeholder agencies when determining need for response:

- **Level 1 – Abnormally Dry:** The State’s precipitation, snowpack, or runoff is lower than normal, or reservoir levels are below average. Conservation measures should be increased voluntarily, to help manage the State’s current water supply.
- **Level 2 – First Stage Drought:** The State’s precipitation, snowpack, or runoff is lower than normal, or reservoir levels are below average. Conservation measures should be increased voluntarily, to help manage the State’s current water supply.
- **Level 3 – Severe Drought:** Reservoirs are low; precipitation, snowpack, and runoff are all well-below normal and forecasted to remain so. Mandatory conservation may need to be enacted in communities that do not have adequate water supplies.
- **Level 4 – Extreme Drought:** Reservoirs are low; precipitation, snowpack, and runoff are all well-below normal and forecasted to remain so. Mandatory conservation may need to be enacted in communities that do not have adequate water supplies.
- **Level 5 – Exceptional Drought:** Extremely dry conditions persist across the State. Water safety, supply, and quality are all at risk due to shortages. All sectors of water usage are facing hardship as a result of inadequate supply and dry conditions.
- **Drought Recovery:** Current Water Conditions throughout the State are at normal levels. No drastic water conservation measures are necessary, although water conservation should always be practiced. The State’s reservoirs are full or nearly full, and runoff across the State is at normal levels (California 2010).

4.2 Hazard Profile

Droughts originate from a deficiency of precipitation resulting from an unusual weather pattern. If the weather pattern lasts a short time (a few weeks or a couple months), the drought is considered short-term. If the weather pattern becomes entrenched and precipitation deficits last for several months or years, the drought
is considered a long-term drought. A region may undergo a long-term circulation pattern that produces drought, with short-term changes in this long-term pattern that result in short-term wet spells. Conversely, a long-term wet circulation pattern may be interrupted by short-term weather spells that result in short-term drought. Droughts typically occur after 2 or 3 years of below-average rainfall during the period from November to March, when about 75 percent of California’s average annual precipitation falls. December, January, and February are when approximately 50 percent of rainfall occurs in California.

### 4.2.1 Past Events

**State of California**

California DWR has state hydrologic data from as far back as the early 1900s ([http://www.water.ca.gov/waterconditions/](http://www.water.ca.gov/waterconditions/)). These data indicate occurrences of multi-year droughts from 1912 to 1913, 1918 to 1920, and 1922 to 1924. The 2010 Association of Bay Area Governments (ABAG) Local Hazard Mitigation Plan also identified several droughts in San Mateo County. Since the multi-year drought in 1922-1924, four prolonged periods of drought have occurred in California, and three noteworthy droughts (two short-term and one long-term) have impacted San Mateo County:

- **1928 to 1934 Drought**—This drought established criteria for designing supply and yield of many large Northern California reservoirs. California DWR estimates that this drought caused the driest period in the Sacramento River watershed since approximately the mid-1550s.

- **1976 to 1977 Drought**—California had one of its most severe droughts due to lack of rainfall during the winters of 1976 and 1977. 1977 was the driest period on record in California, with the previous winter recorded as the fourth driest in California’s hydrological history. The cumulative impact led to widespread water shortages and severe water conservation measures throughout the State. Only 37 percent of average Sacramento Valley runoff was received, with just 6.6 million acre-feet recorded. Over $2.6 billion in crop damage was recorded in 31 counties. A federal disaster declaration was declared in Placer County and surrounding counties.

- **San Mateo County was included in the statewide drought declaration on March 26, 1976.**

- **1987-1992 Drought**—California received precipitation well below average levels for four consecutive years. While the Central Coast was most affected by lack of rainfall and low runoff, the Sierra Nevadas in Northern California, as well as the Central Valley counties including Placer County, were also affected. During this drought, only 56 percent of average runoff for the Sacramento Valley was received, totaling just 10 million acre-feet. By February 1991, all 58 counties in California were suffering under drought conditions that affected urban, rural, and agricultural areas.

- **June 6, 2006 Drought**—San Mateo was part of a declared water management and fish shortage disaster in 2006. Klamath River Basin Chinook salmon populations were extremely low due to ocean conditions, drought, water management, water quality, water flows, disease, and eliminated access to historical spawning habitat. This resulted in environmental, recreational, commercial, and economic impacts. Although this event is not technically a direct drought event, it has been included here because it was exacerbated by drought conditions.
February 27, 2009 Drought—A drought declaration was declared statewide after a 3-year drought resulting from below-average rainfall, low snowmelt runoff, and the largest court-ordered water restriction in state history (at the time). The drought led to $300 million in agricultural revenue loss and potential long-term economic losses of $3 billion.

2012-2016 (Ongoing) Drought—California’s current drought has set several records for the State. From 2012 to 2014, it ranked as the driest three consecutive years for statewide precipitation. Calendar year 2014 set new climate records for statewide average temperatures and for record-low water allocations from State Water Project and federal Central Valley Project contractors. Calendar year 2013 set minimum annual precipitation records for many communities. The State has detailed executive orders and regulations concerning water conservation and management. Total impacts of the drought cannot be determined until after its conclusion.

San Mateo County has been impacted by current drought conditions across the State. Local news sources indicate significant effects on the southern coastline because many residents in this area rely on creeks and wells that have stopped flowing. Rural communities in the County have faced stringent limitations on bathing, using toilets, and washing items, and the many ranches and farms in the area have undergone significant economic downturns. More urban parts of the San Francisco Bay area, served by big water agencies, have also undergone limitations because of need to conserve water, but not to the extent imposed on rural residents (SFGate 2014).

Although El Niño-related storms in February 2014 brought precipitation to the region, levels of rain and snow did not provide the amount of water needed. As of March 2014, the Hetch Hetchy area had received only 34.7 percent of normal annual precipitation. Even with the February 2014 storms increasing snowpack levels by 10 percent, the snowpacks remained at only 32 percent of median April 1st snowpack conditions. Additionally, Bay Area watersheds had received only 33 percent of normal annual precipitation as of March 2014 (San Mateo County Sheriff 2015).

Responding particularly to the current drought, San Mateo County and its cities have implemented the following initiatives to maintain quantity and quality of their water resources in the County (San Mateo County 2016):

- San Mateo Countywide Water Pollution Program
- Groundwater Protection Program
- Land Use and Septic Wells Program
- Recreational Water Quality Program
- Small Drinking Water Systems Program
- Municipal Facilities Water Conservation Efforts.

4.2.2 Location

The National Oceanic and Atmospheric Administration (NOAA) has developed several indices to measure and map impacts, severities, extents, and locations of droughts:
The **Palmer Crop Moisture** Index measures short-term drought on a weekly scale and is used to quantify drought’s impacts on agriculture during the growing season. Figure 4-2 shows this index for the week ending January 30, 2016.

The **Palmer Z Index** measures short-term drought on a monthly scale. Figure 4-3 shows this index for December 2015.

The **Palmer Drought Severity Index (PDSI)** measures duration and intensity of long-term, drought-inducing circulation patterns. Long-term drought is cumulative, so intensity of drought during a given month depends on current weather patterns plus cumulative patterns over previous months. Weather patterns can change quickly from a long-term drought pattern to a long-term wet pattern, and the PDSI can respond fairly rapidly. Figure 4-4 shows this index for December 2015.

Hydrological impacts of drought (e.g., reservoir levels, groundwater levels, etc.) take longer to develop, and recovery from these impacts can take even longer. The **Palmer Hydrological Drought Index (PHDI)**, another long-term index, was developed to quantify hydrological effects. The PHDI responds more slowly to changing conditions than the PDSI. Figure 4-5 shows this index for December 2015.

While the Palmer indices consider precipitation, evapotranspiration and runoff, the **Standardized Precipitation Index (SPI)** considers only precipitation. In the SPI, an index of zero indicates the median precipitation amount; the index is negative for drought and positive for wet conditions. The SPI is computed for time scales ranging from 1 to 24 months. Figure 4-6 shows the 24-month SPI map for January 2013 through December 2015.

![Crop Moisture Index by Division](image-url)

**Figure 4-2. Crop Moisture Index for Week Ending January 30, 2016**
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FIGURE 4-3. PALMER Z INDEX SHORT-TERM DROUGHT CONDITIONS (DECEMBER 9, 2015)

FIGURE 4-4. PALMER DROUGHT SEVERITY INDEX (DECEMBER 2015)
**SECTION 2 - Chapter 4**

**Drought**

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**Figure 4-5. Palmer Hydrological Drought Index Long-Term Hydrologic Conditions (December 2015)**

**Figure 4-6. 24-Month Standardized Precipitation Index (January 2013 – December 2015)**
4.2.3 Frequency

Historical drought data regarding the San Mateo County region indicate four significant droughts within the last 40 years (the 1987-1992 drought was not noted as directly affecting San Mateo County, and is not included in this count). Based on risk factors and past occurrences, droughts likely will continue to occur in San Mateo County. Moreover, as temperatures increase, probability of future droughts will likely increase as well. Therefore, droughts likely will occur in California and San Mateo County at varied severities in the future, even after conclusion of this current drought.

4.2.4 Severity

Drought can exert widespread impacts on the environment and the economy, although not typically resulting in direct loss of life or damage to property, as do other natural disasters. Nationwide, drought primarily affects the sectors of agriculture, transportation, recreation and tourism, forestry, and energy. Social and environmental impacts are also significant, although determining exact costs of these is difficult. The National Drought Mitigation Center describes likely drought impacts within three categories:

- **Agricultural**—Drought threatens crops that rely on natural precipitation.
- **Water supply**—Drought threatens supplies of water for irrigated crops and for communities.
- **Fire hazard**—Drought increases the threat of wildfires from dry conditions in forest and rangelands.

Severity of a drought depends on degree of moisture deficiency, duration, and size and location of the affected area. The longer the duration of the drought and the larger the area impacted, the more severe the potential impacts. When measuring severity of droughts, analysts typically look at economic impacts. All people could pay more for water if utilities increase rates due to shortages. Agricultural impacts can result in loss of work for farm workers and those in related food processing jobs. Other water- or electricity-dependent industries are commonly forced to shut down all or a portion of their facilities, resulting in further layoffs. A drought can harm recreational companies that use water (e.g., swimming pools, water parks, and river rafting companies), as well as landscape and nursery businesses. Specific impacts of drought on County residents and businesses are described further in the Vulnerability Analysis section of this profile.

Drought generally does not affect groundwater sources as quickly as surface water supplies, but groundwater supplies generally take longer to recover. Reduced precipitation during a drought means that groundwater supplies are not replenished at a normal rate. This can lead to reduction in groundwater levels and problems such as reduced pumping capacity or wells going dry. Shallow wells are more susceptible than deep wells to a reduction in groundwater levels and other problems previously described. Reduced replenishment of groundwater affects streams. Much of the flow in streams comes from groundwater, especially during the summer when precipitation is less and after snowmelt ends. Reduced groundwater levels mean that even less water will enter streams when stream flows are lowest. In San Mateo County, 67 percent of agriculture water supply (2,000 acre-feet) comes from groundwater, while 8 percent of urban use needs (8,500 acre-feet) comes from groundwater. In total, 9 percent (10,500 acre-feet) of the County’s water use comes from groundwater resources (DWR 2013).
Significant depletion of groundwater supplies resulting from a drought, excessive groundwater pumping, or a combination of the two can lead to an unanticipated side effect and secondary hazard—subsidence. Without groundwater aquifers to support the weight of the ground, land collapses downward. The greatest cause of subsidence in California is compaction of aquifer systems. Although this is typically due to groundwater pumping and not drought, drought also magnifies need for greater groundwater pumping as freshwater sources elsewhere are not as readily available. This subsidence is significant because it is typically irreversible. It may also cause wetlands to change size and shape, migrate to lower elevations, or disappear entirely; rivers may change course; and erosion/deposition patterns may change (CA Water Science Center 2016). Although land sinkage due to low groundwater levels has not yet occurred in San Mateo County, this subsidence is a significant concern in parts of the State, most notably the San Joaquin Valley and Central Valley. Part of Central Valley, southwest of Mendota, underwent more than 29 feet of subsidence between 1925 and 1977 (CA Water Science Center 2015).

4.2.5 Warning Time

Droughts are climatic patterns that occur over long periods of time. Only generalized warning can occur due to numerous variables that scientists have not pieced together well enough to make accurate and precise predictions.

Empirical studies over the past century have shown that meteorological drought is never the result of a single cause. It is the result of many, often synergistic causes that include global weather patterns which produce persistent, upper-level, high-pressure systems along the West Coast with warm, dry air—resulting in less precipitation.

Scientists currently do not know how to predict drought more than a month in advance for most locations. Predicting drought depends on ability to forecast precipitation and temperature. Anomalies of precipitation and temperature may last from several months to several decades; California is currently undergoing a several-year-long drought, while other areas in the United States may undergo droughts during periods as short as 1 or 2 months. How long droughts last depends on interactions between the atmosphere and the oceans, soil moisture and land surface processes, topography, internal dynamics, and accumulated influence of weather systems on the global scale.

4.3 Secondary Hazards

The secondary hazard most commonly associated with drought is wildfire. A prolonged lack of precipitation dries out vegetation, which becomes increasingly susceptible to ignition as the duration of the drought extends. Millions of board feet of timber have been lost, and in many cases erosion occurred that seriously damaged aquatic life, irrigation, and power production as a result of heavy silting of streams, reservoirs, and rivers.

Drought also is often accompanied by extreme heat, exposing people to risks of sunstroke, heat cramps, and heat exhaustion. Pets and livestock are also vulnerable to heat-related injuries. Crops can be vulnerable as well.

Environmental losses result from damage to plants, animals, wildlife habitat, and air and water quality; forest and range fires; degradation of landscape quality; loss of biodiversity; and soil erosion. Some effects are short-
term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded through loss of wetlands, lakes, and vegetation. However, many species will eventually recover from this temporary aberration. Degradation of landscape quality, including increased soil erosion, may lead to a more permanent loss of biological productivity.

Drought-induced subsidence is also a potential secondary hazard, although not as common as wildfire or extreme heat. If subsidence does occur, however, it can significantly impact the local environment, floodplain/wetlands, and water supply. Although environmental losses are difficult to quantify, growing public awareness and concern for environmental quality have forced public officials to focus greater attention and resources on these effects.

4.4 Exposure

All people, property, and environments within San Mateo County would be exposed to some degree to effects of moderate to extreme drought conditions.

4.5 Vulnerability

Drought produces a complex web of impacts that span many sectors of the economy and reach well beyond the area undergoing physical drought. This complexity exists because water is integral to ability to produce goods and provide services. Drought can affect a wide range of economic, environmental, and social activities. Vulnerability of an activity to effects of drought usually depends on its water demand, how the demand is met, and what water supplies are available to meet the demand.

California’s 2005 Water Plan and subsequent updates indicate that water demand in the State will increase through 2030. Although the Department of Water Resources predicts a modest decrease in agricultural water use, the agency anticipates that urban water use will increase by 1.5 to 5.8 million acre-feet per year (CA DWR 2005). The 2013 update to the Water Plan explores measures, benchmarks, and successes in increasing agricultural and urban water use efficiency. Between 1996 and 2005, average amount of water use in the San Francisco Bay area (including San Mateo County) was 155 gallons per capita per day (gpcd); the statewide average was 198 gpcd. The State established a 20 percent water use reduction goal to be achieved by 2020. Although regional estimates were not available, state average for water use reduction was at 16 percent (or 166 gpcd) by 2010 (CA DWR 2013).

4.5.1 Population

The entire population of San Mateo County is vulnerable to drought events. Drought conditions can affect people’s health and safety, including health problems related to low water flows and poor water quality, and health problems related to dust. Droughts can also lead to loss of human life (National Drought Mitigation Center [NDMC] 2014). Other possible impacts on health from drought include increased recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and sanitation and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Health implications of drought
are numerous. Some drought-related health effects are short-term while others can be long-term (Centers for Disease Control and Prevention [CDC] 2012).

As previously stated, drought conditions can cause shortages of water for human consumption. Droughts can also lead to reduced local firefighting capabilities. Despite these concerns, the County of San Mateo, BAWSCA, regional water purveyors, and other regional stakeholders have devoted considerable time and effort to protect life, safety, and health during times of consecutive dry years, such as the current drought situation. Provisions and measures have been taken to analyze and account for anticipated water shortages. With coordination from its cities, the County has the ability to minimize and reduce impacts on residents and water consumers in San Mateo County. No significant life or health effects are anticipated as a result of drought in San Mateo County.

4.5.2 Property

No structures will be directly affected by drought conditions in San Mateo County, although some structures may become vulnerable to wildfires, which are more likely following years of drought. Risk to life and property is greatest where forested areas adjoin urbanized areas (high-density residential, commercial, and industrial)—also known as the wildfire urban interface (WUI). Therefore, all assets in and adjacent to the WUI zone, including population, structures, critical facilities, lifelines, and businesses, are considered vulnerable to wildfire. Specific vulnerability regarding wildfire is addressed in Chapter 10.

4.5.3 Critical Facilities

Critical facilities as defined for this Plan will continue to be operational during a drought. Critical facility elements such as landscaping may not be maintained due to limited resources, but risk to the County’s critical facilities inventory will be largely aesthetic. For example, when water conservation measures are in place, landscaped areas will not be watered and may die. These aesthetic impacts are not considered significant. Additionally, where possible, the County Office of Sustainability engages in other water conservation measures, such as installation of water conserving fixtures in its municipal facilities (San Mateo County 2016).

4.5.4 Environment

Environmental losses from drought are associated with damage to plants, animals, wildlife habitat, and air and water quality; forest and range fires; degradation of landscape quality; loss of biodiversity; and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded through loss of wetlands, lakes, and vegetation. However, many species will eventually recover from this temporary aberration. Degradation of landscape quality, including increased soil erosion, may lead to more permanent loss of biological productivity. Although environmental losses are difficult to quantify, growing public awareness and concern for environmental quality has forced public officials to focus greater attention and resources on these effects.
4.5.5 Economic Impact

Drought causes the most significant economic impacts on industries that use water or depend on water for their business, most notably, agriculture and related sectors (forestry, fisheries, and waterborne activities). In addition to losses in yields in crop and livestock production, drought is associated with increased insect infestations, plant diseases, and wind erosion. Drought can lead to other losses because so many sectors are affected—losses that include reduced income for farmers and reduced business for retailers and others who provide goods and services to farmers. This leads to unemployment, increased credit risk for financial institutions, capital shortfalls, and loss of tax revenue. Prices for food, energy, and other products may also increase as supplies decrease.

When a drought occurs, the agricultural industry faces greatest risk of economic impact and damage. During droughts, crops do not mature, resulting in smaller crop yields, undernourishment of wildlife and livestock, decreases in land values, and ultimately financial losses to farmers (Federal Emergency Management Agency [FEMA] 1997). Agriculture production has been a significant and growing factor in San Mateo County, especially as agricultural effects on the economy start to normalize (after a period of decline). Agricultural production created $148.3 million in total economic output within the County ($73.137 million of which resulted from multiplier effects), and indirect and induced spending supported another 3,425 jobs in the County (San Mateo County 2012).

Evaluation of direct effects (i.e., excluding indirect and induced spending benefits) can occur based on information conveyed in U.S. Department of Agriculture (USDA) reports. According to the 2012 Census of Agriculture, 334 farms were present in San Mateo County, encompassing 48,160 acres of total farmland. The average farm size was 144 acres. San Mateo County farms had a total market value of products sold of $75.89 million ($73.137 million in crops including nursery and greenhouse; and $2.751 million in livestock, poultry, and related products), averaging $227,212 per farm. The Census indicated that 187 farm operators reported farming as their primary occupation (USDA 2012). Table 4-1 lists acreage of agricultural land exposed to the drought hazard.

<table>
<thead>
<tr>
<th>Number of Farms</th>
<th>Land in Farms (acres)</th>
<th>Total Cropland (acres)</th>
<th>Harvested Cropland (acres)</th>
<th>Irrigated Land (acres)</th>
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</thead>
<tbody>
<tr>
<td>334</td>
<td>48,160</td>
<td>8,477</td>
<td>4,033</td>
<td>2,822</td>
</tr>
</tbody>
</table>

Source: USDA 2012

In 2012, the top three categories of agricultural products sold in San Mateo County were (1) nursery, greenhouse, floriculture, and sod at $63.4 million; (2) vegetables, melons, potatoes, and sweet potatoes at $7,354 million; and (3) fruits, tree nuts, and berries at $2 million. San Mateo County was fifth highest ranked in both the State and the country in sales of Brussels sprouts; it was eighth highest ranked in the State for sales of cut Christmas trees; and eleventh highest ranked in the State for sales of floriculture and bedding crops (USDA 2012).
A prolonged drought can affect a community’s economy significantly. Increased demand for water and electricity may result in shortages and higher costs of these resources. Industries that rely on water for business may be impacted the most (e.g., landscaping businesses). Although most businesses will still be operational, they may be affected aesthetically—especially the recreation and tourism industry. Moreover, droughts within another area could affect food supply/price of food for residents within the County.

4.6 Future Trends in Development

San Mateo County considers land use development, water supply and resource concerns, and other environmental and hazard protection needs in its Shared Vision 2025. The County seeks to ensure a “prosperous community” via encouragement of innovation in the local economy, creation of jobs, and expansion of community and educational opportunities; improved affordability; and closure of achievement gaps. It also seeks a “livable community” that grows near transit locations to promote affordable and interconnected communities. Under its “environmentally conscious community” category, San Mateo seeks to preserve natural resources through stewardship; reduction of carbon emissions; and more efficient uses of energy, water, and land. Performance measures and benchmarks are updated annually on the Shared Vision 2025 website (https://performance.smcgov.org/shared-vision), allowing residents to consistently monitor successes and outcomes of local initiatives.

Additionally, land use planning is also directed by general plans adopted under California’s General Planning Law. Municipal planning partners are encouraged to establish General Plans with policies directing land use and dealing with issues of water supply and protection of water resources. These plans increase capability at the local municipal level to protect future development from impacts of drought. All planning partners reviewed their general plans under the capability assessments undertaken for this effort. Deficiencies revealed by these reviews can be identified as mitigation actions to increase capability to deal with future trends in development.

4.7 Scenario

Continuation or exacerbation of the current situation across the State of California (i.e., an extreme, multiyear drought associated with record-breaking rates of low precipitation and high temperatures) is the worst-case scenario for San Mateo County. Low precipitation and high temperatures increase possibility of wildfires throughout the County, increasing need for water when water is already in limited supply. Surrounding counties, also under drought conditions, could increase their demand for the water supplies on which San Mateo County also relies, triggering social and political conflicts. The higher density population of the Bay Area increases likelihood of such conflicts despite existence of the BACSWA DRIP. Additionally, the longer drought conditions last in or near the County, the greater the effect on the local economy; water-dependent industries especially will undergo setbacks.

4.8 Issues

The planning team has identified the following drought-related issues:

- Identification and development of alternative water supplies
- Development of local or regional (BACSWA) drought-level indicators to correspond with DRIP or other water conservation measures
- Monitoring of implementation and benefits of the Long-Term Reliable Water Supply Strategy projects, WCIP projects, and water system CIP upgrades
- Application of alternative techniques (groundwater recharge, water recycle, local capture and reuse, desalination, and transfer) to stabilize and offset Sierra Nevada snowpack water supply shortfalls
- Probability of increased drought frequencies and durations due to climate change
- Promotion of active water conservation even during non-drought periods
- Regular occurrence of drought or multiyear droughts that may limit the County’s and residents’ ability to successfully recover from or prepare for more occurrences—particularly noteworthy due to longevity of the current ongoing drought.
5.1 General Background

An earthquake is the vibration of the earth’s surface that follows a release of energy in the earth’s crust. This energy can be generated by a sudden dislocation of segments of the crust or by a volcanic eruption. Most destructive quakes are caused by dislocations of the crust. The crust may first bend and then, when the stress exceeds the strength of the rocks, break and snap to a new position. Vibrations called “seismic waves” are generated in the process of breaking. These waves travel outward from the source of the earthquake along the surface and through the earth at varying speeds, depending on the material they move through.

Geologists have found that earthquakes tend to reoccur along faults, which are zones of weakness in the earth’s crust. Even if a fault zone has recently experienced an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake could still occur. In fact, relieving stress along one part of a fault may increase it in another part.

California is seismically active because of movement of the North American Plate, where everything east of the San Andreas Fault sits, and the Pacific Plate, which includes the coastal communities. The movement of the tectonic plates creates stress released as energy that moves through the earth as waves called earthquakes.

Active faults have experienced displacement in historical time. However, inactive faults, where no such displacements have been recorded, also have the potential to reactivate or experience displacement along a branch sometime in the future. An example of a fault zone that has been reactivated is the Foothills Fault Zone. The zone was considered inactive until evidence of an earthquake (approximately 1.6 million years ago) was found near Spenceville, California. Then, in 1975, an earthquake occurred on another branch of the zone near Oroville, California (now known as the Cleveland Hills Fault). The State Division of Mines and Geology indicates that increased earthquake activity throughout California may cause tectonic movement along currently inactive fault systems.

DEFINITIONS

Earthquake—The shaking of the ground caused by an abrupt shift of rock along a fracture in the earth or a contact zone between tectonic plates. Earthquakes are typically measured in both magnitude and intensity.

Epicenter—The point on the earth’s surface directly above the hypocenter of an earthquake. The location of an earthquake is commonly described by the geographic position of its epicenter and by its focal depth.

Fault—A fracture in the earth’s crust along which two blocks of the crust have slipped with respect to each other.

Focal Depth—The depth from the earth’s surface to the hypocenter.

Hypocenter—The region underground where an earthquake’s energy originates.

Liquefaction—Loosely packed, water-logged sediments losing their strength in response to strong shaking, causing major damage during earthquakes.
5.1.1 Damage from Earthquakes

A direct relationship exists between a fault’s length and location and its ability to generate damaging ground motion at a given site. Small, local faults produce lower magnitude quakes, but ground shaking can be strong and damage can be significant in areas close to the fault. In contrast, large regional faults can generate earthquakes of great magnitudes but, because of their distance and depth, they may result in only moderate shaking in an area.

Earthquakes can last from a few seconds to more than 5 minutes; they may also occur as a series of tremors over a period of several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Instead, casualties generally result from falling objects and debris, because the shocks shake, damage, or demolish buildings and other structures. Disruption of communications, electrical power supplies and gas, and sewer and water lines should be expected. Earthquakes may trigger fires, dam failures, landslides, or releases of hazardous material, compounding their disastrous effects.

5.1.2 Earthquake Classifications

Earthquakes are typically classified in one of two ways: By the amount of energy released, measured as magnitude; or by the impact on people and structures, measured as intensity.

Magnitude

Currently, the most commonly used magnitude scale is the moment magnitude ($M_w$) scale, with the following classifications of magnitude:

<table>
<thead>
<tr>
<th>Magnitude Class</th>
<th>Magnitude Range ($M_w$-magnitude)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great</td>
<td>$M_w \geq 8$</td>
</tr>
<tr>
<td>Major</td>
<td>$M_w = 7.0 - 7.9$</td>
</tr>
<tr>
<td>Strong</td>
<td>$M_w = 6.0 - 6.9$</td>
</tr>
<tr>
<td>Moderate</td>
<td>$M_w = 5.0 - 5.9$</td>
</tr>
<tr>
<td>Light</td>
<td>$M_w = 4.0 - 4.9$</td>
</tr>
<tr>
<td>Minor</td>
<td>$M_w = 3.0 - 3.9$</td>
</tr>
<tr>
<td>Micro</td>
<td>$M_w &lt; 3$</td>
</tr>
</tbody>
</table>

Estimates of moment magnitude roughly match the local magnitude scale (ML), commonly called the Richter scale. One advantage of the moment magnitude scale is that, unlike other magnitude scales, it does not saturate at the upper end. That is, there is no value beyond which all large earthquakes have about the same magnitude. For this reason, moment magnitude is now the most often used estimate of large earthquake magnitudes.
Intensity

Currently, the most commonly used intensity scale is the modified Mercalli intensity scale, with ratings defined as follows (USGS 2014):

<table>
<thead>
<tr>
<th>Mercalli Intensity</th>
<th>Shaking</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Not Felt</td>
<td>Not felt except by a very few under especially favorable conditions.</td>
</tr>
<tr>
<td>II</td>
<td>Weak</td>
<td>Felt only by a few persons at rest, especially on upper floors of buildings.</td>
</tr>
<tr>
<td>III</td>
<td>Weak</td>
<td>Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing automobiles may rock slightly. Vibrations are similar to the passing of a truck. Duration estimated.</td>
</tr>
<tr>
<td>IV</td>
<td>Light</td>
<td>Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing automobiles rocked noticeably.</td>
</tr>
<tr>
<td>V</td>
<td>Moderate</td>
<td>Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.</td>
</tr>
<tr>
<td>VI</td>
<td>Strong</td>
<td>Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.</td>
</tr>
<tr>
<td>VII</td>
<td>Very Strong</td>
<td>Felt by all. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.</td>
</tr>
<tr>
<td>VIII</td>
<td>Severe</td>
<td>Felt by all. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.</td>
</tr>
<tr>
<td>IX</td>
<td>Violent</td>
<td>Felt by all. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.</td>
</tr>
<tr>
<td>X</td>
<td>Extreme</td>
<td>Felt by all. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.</td>
</tr>
</tbody>
</table>

5.1.3 Ground Motion

Earthquake hazard assessment is also based on expected ground motion. This assessment involves estimating the annual probability that certain ground motion accelerations will be exceeded, and then summing the annual probabilities over the time period of interest. The most commonly mapped ground motion parameters are the horizontal and vertical peak ground accelerations (PGA) for a given soil or rock type. Instruments called accelerographs record levels of ground motion due to earthquakes at stations throughout a region. PGA is measured in g (the acceleration due to gravity) or expressed as a percent acceleration force of gravity (%g). These readings are recorded by state and federal agencies that monitor and predict seismic activity.

Maps of PGA values form the basis of seismic zone maps that are included in building codes such as the International Building Code. Building codes that include seismic provisions specify the horizontal force caused by lateral acceleration that a building should be able to withstand during an earthquake. PGA values are directly related to these lateral forces that could damage “short period structures” (such as single-family dwellings).
Longer period response components control the lateral forces that damage larger structures with longer natural periods (apartment buildings, factories, high-rises, and bridges). Table 5-3 lists damage potential and perceived shaking by PGA factors, compared with the Mercalli scale.

<table>
<thead>
<tr>
<th>Modified Mercalli Scale</th>
<th>Perceived Shaking</th>
<th>Potential Structure Damage</th>
<th>Estimated PGA&lt;sup&gt;a&lt;/sup&gt; (%g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Not Felt</td>
<td>None</td>
<td>&lt;0.17%</td>
</tr>
<tr>
<td>II-III</td>
<td>Weak</td>
<td>None</td>
<td>0.17% - 1.4%</td>
</tr>
<tr>
<td>IV</td>
<td>Light</td>
<td>None</td>
<td>1.4% - 3.9%</td>
</tr>
<tr>
<td>V</td>
<td>Moderate</td>
<td>Very Light</td>
<td>3.9% - 9.2%</td>
</tr>
<tr>
<td>VI</td>
<td>Strong</td>
<td>Light</td>
<td>9.2% - 18%</td>
</tr>
<tr>
<td>VII</td>
<td>Very Strong</td>
<td>Moderate</td>
<td>18% - 34%</td>
</tr>
<tr>
<td>VIII</td>
<td>Severe</td>
<td>Moderate/Heavy</td>
<td>34% - 65%</td>
</tr>
<tr>
<td>IX</td>
<td>Violent</td>
<td>Heavy</td>
<td>65% - 124%</td>
</tr>
<tr>
<td>X - XII</td>
<td>Extreme</td>
<td>Very Heavy</td>
<td>&gt;124%</td>
</tr>
</tbody>
</table>

<sup>a</sup> PGA measured in percent of g, where g is the acceleration of gravity

Sources: USGS, 2008; USGS, 2010

The U.S. Geological Survey (USGS) updated the National Seismic Hazard Maps in 2014, which supersede the 2008 and 2002 maps. New seismic, geologic, and geodetic information on earthquake rates and associated ground shaking were incorporated into these revised maps. The 2014 map represents the best available data as determined by the USGS. The 2014 Seismic Hazard Map shows that most of San Mateo County has a PGA of 0.4g or greater, and that a very small portion of the County (along the coast) has a PGA between 0.02g and 0.04g (refer to Figure 5-1). This map is based on peak ground acceleration (g) with 10 percent probability of exceedance in 50 years. Maps further in this profile (under the Location subsection) provide 100-year and 500-year probabilistic PGAs, a San Andreas Fault Scenario PGA, and a San Gregorio Fault PGA.
FIGURE 5-1. PEAK ACCELERATION (%G) WITH 10% PROBABILITY OF EXCEEDANCE IN 50 YEARS

Ten-percent probability of exceedance in 50 years map of peak ground acceleration

Note: The black circle indicates the approximate location of San Mateo County.
5.1.4 Effect of Soil Types

The impact of an earthquake on structures and infrastructure is largely a function of ground shaking, distance from the source of the quake, and liquefaction, a secondary effect of an earthquake caused when soils lose their shear strength and flow or behave as liquid, thereby damaging structures that derive their support from the soil. Liquefaction generally occurs in soft, unconsolidated sedimentary soils. A program called the National Earthquake Hazard Reduction Program (NEHRP) creates maps based on soil characteristics to help identify locations subject to liquefaction. Table 5-4 summarizes NEHRP soil classifications. NEHRP Soils B and C typically can sustain ground shaking without much effect, depending on the earthquake magnitude. The areas that are commonly most affected by ground shaking have NEHRP Soils D, E and F. In general, these areas are also most susceptible to liquefaction.

<table>
<thead>
<tr>
<th>NEHRP Soil Type</th>
<th>Description</th>
<th>Mean Shear Velocity to 30 m (m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Hard Rock</td>
<td>1,500</td>
</tr>
<tr>
<td>B</td>
<td>Firm to Hard Rock</td>
<td>760-1,500</td>
</tr>
<tr>
<td>C</td>
<td>Dense Soil/Soft Rock</td>
<td>360-760</td>
</tr>
<tr>
<td>D</td>
<td>Stiff Soil</td>
<td>180-360</td>
</tr>
<tr>
<td>E</td>
<td>Soft Clays</td>
<td>&lt; 180</td>
</tr>
<tr>
<td>F</td>
<td>Special Study Soils (liquefiable soils, sensitive clays, organic soils, soft clays &gt;36 m thick)</td>
<td></td>
</tr>
</tbody>
</table>

The USGS has created a soil type map for the San Francisco Bay area that provides rough estimates of site effects based on surface geology. NEHRP soil types were assigned to a geologic unit based on the average velocity of that unit, and USGS notes that this approach can lead to some inaccuracy. For instance, a widespread unit consisting of Quaternary sand, gravel, silt, and mud has been assigned as Class C soil types; however, some of the slower soil types in this unit fall under Class D. USGS does not have any way of differentiating units for slower-velocity soils in its digital geologic dataset (USGS 2016).

5.2 Hazard Profile

California is seismically active because it sits on the boundary between two of the earth’s tectonic plates. Most of the state – everything east of the San Andreas Fault – is on the North American Plate. The Cities of Monterey, Santa Barbara, Los Angeles, and San Diego are on the Pacific Plate, which is constantly moving northwest past the North American Plate. The relative rate of movement is about 2 inches (50 millimeters) per year (SHMP 2013). Earthquakes in the San Francisco Bay region result from strain energy constantly accumulating across the region because of the northwestward motion of the Pacific Plate relative to the North American Plate.
### 5.2.1 Past Events

The last significant (> 6.0 M) seismic event recorded in the San Mateo vicinity, measuring 7.1 on the Richter scale, occurred in 1989 during the San Andreas Loma Prieta Earthquake that originated 10 miles northeast of Santa Cruz, California. No significant seismic events in the San Mateo County vicinity have been recorded since then. Other significant earthquakes in California include the 1906 earthquake in San Francisco, the 1971 San Fernando Earthquake, the 1994 Northridge earthquake, and the 2014 Napa earthquake.

Although the 1906 earthquake is most commonly associated with the City of San Francisco, San Mateo County was also greatly affected. In 1980, the USGS researched these impacts to use a standard for scenario impacts to the region. Damages are noted by jurisdiction and range from landslides; ground deformation, and infrastructure damage (to roadways, electric car rail lines, and similar infrastructure); house and building collapse, house shifts, and foundation cracks; fires; injuries; ground cracks; and more (USGS 1980).

Table 5-5. Recent Earthquakes Magnitude 5.0 or Larger Within 100-mile radius lists recent earthquakes with a magnitude of 5.0 or greater within a 100-mile radius of San Mateo County.

<table>
<thead>
<tr>
<th>Date</th>
<th>Magnitude</th>
<th>Epicenter Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/24/2014</td>
<td>6.0</td>
<td>6 miles southwest of Napa, CA</td>
</tr>
<tr>
<td>10/31/2007</td>
<td>5.6</td>
<td>10 miles northeast of San Jose, CA</td>
</tr>
<tr>
<td>8/10/2001</td>
<td>5.50</td>
<td>9 miles west of Portola, CA</td>
</tr>
<tr>
<td>9/3/2000</td>
<td>5.17</td>
<td>8 miles northwest of Napa, CA</td>
</tr>
<tr>
<td>10/17/1989</td>
<td>7.1</td>
<td>10 miles northeast of Santa Cruz, CA</td>
</tr>
<tr>
<td>3/31/1986</td>
<td>5.70</td>
<td>12 miles east-northeast of Milpitas, CA</td>
</tr>
</tbody>
</table>

Source: USGS

### 5.2.2 Location

San Mateo County is located in a region of high seismicity because of the presence of the San Andreas Fault that bisects the county on the coastal region and the presence of the Hayward Fault across the bay to the east and the San Gregorio Fault to the west. The primary seismic hazard for the county is potential ground shaking from these three large faults. The San Andreas Fault is a transform boundary that spans approximately 810 miles from the East Pacific rise in the Gulf of California through the Mendocino fracture zone off of the shore of northern California. The fault is estimated to be 28 million years old. The San Andreas Fault is an example of a transform boundary exposed on a continent. The fault forms the tectonic boundary between the Pacific Plate and the North American Plate, and its motion is right-lateral strike-slip.

The San Andreas Fault is typically referenced in three segments. The southern segment extends from its origin at the East Pacific Rise to Parkfield, California, in Monterey County. The central segment extends from Parkfield to Hollister, California. Finally, the northern segment of the fault extends northwest from Hollister, through San Mateo County, to its ultimate junction with the Mendocino fracture zone and the Cascadia subduction zone in the Pacific Ocean.
The San Andreas Fault poses the greatest risk for San Mateo County by passing through the County’s center, including passage through the population centers of Daly City and San Bruno, posing considerable risk for surface fault rupture within the two cities. According to the Association of Bay Area Governments (ABAG), the San Andreas Fault has a 21 percent chance of generating a magnitude 6.7 or greater earthquake in the next 30 years. The last earthquake with a magnitude over 5.0 with an epicenter in San Mateo County was the 1957 Daly City earthquake with a magnitude of 5.3. While the epicenter of the magnitude 7.8 earthquake in 1906 on the San Andreas Fault was not located within the county, it still caused extreme ground shaking. A similar earthquake in the future will likely do the same, especially in the heavily populated Bayside, much of which is underlain by alluvial deposits, Bay Mud, and artificial fill. A rupture along the peninsula will cause extremely violent ground shaking throughout the county. The bay margins will also be likely to experience liquefaction in a major earthquake (ABAG 2013).

**Hayward Fault**

The Hayward Fault is an approximately 45-mile-long fault that parallels the San Andreas Fault on the East Bay. The Hayward Fault extends through some of the Bay Area’s most populated areas, including San Jose, Oakland, and Berkeley. The Hayward Fault is a right lateral slip fault.

According to the 2008 Uniform California Rupture Forecast, Version 2, the Hayward Fault has a 31-percent chance of producing a magnitude 6.7 or greater earthquake in the next 30 years. An earthquake of this magnitude has regional implications for the entire Bay Area, as the Hayward Fault crosses numerous transportation and resource infrastructure, such as multiple highways and the Hetch Hetchy Aquaduct. Disruption of the Hetch Hetchy system has the potential to severely impair water services to San Mateo County. The Hayward Fault is increasingly becoming a hazard priority throughout the bay region because of its increased chance for activity and its intersection with multiple highly populated areas and critical infrastructure.

**San Gregorio Fault**

The San Gregorio Fault is situated toward the western edge of San Mateo County, crossing briefly over uninhabited land in San Mateo County around Pillar Point at Half Moon Bay. The fault line runs from southern Monterey Bay through Bolinas Bay, where the north section of the San Gregorio Fault intersects with the San Andreas Fault offshore north of San Francisco. San Gregorio is considered the principal active fault west of San Andreas for the Bay Area region.

The San Gregorio Fault is one of the less studied fault lines, the result of its primary location offshore and its proximity to the more infamous San Andreas Fault and seemingly more volatile Hayward Fault. USGS concluded that the San Gregorio Fault is a northwest-trending right-lateral slip deformation. The probability of experiencing a magnitude 6.7 or greater earthquake along the San Gregorio Fault within the next 30 years is 6-percent – significantly less than San Andreas Fault or Hayward Fault. However, the location of the fault poses a significant threat to San Mateo County.

Table 5-6 lists additional faults within the Bay Area outside of the three local major faults, and Figure 5-2. Significant Known Faults in the Bay Area, provides location and probability for these bay area fault lines.
TABLE 5-6. ADDITIONAL FAULTS WITHIN A 50-MILE RADIUS

<table>
<thead>
<tr>
<th>Fault</th>
<th>Approximate Distance (miles/direction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calaveras</td>
<td>17 miles from East Palo Alto</td>
</tr>
<tr>
<td>Greenville</td>
<td>23 miles from Menlo Park</td>
</tr>
<tr>
<td>Mount Diablo Thrust</td>
<td>27 miles from South San Francisco</td>
</tr>
<tr>
<td>Concord-Green Valley</td>
<td>30 miles from South San Francisco</td>
</tr>
<tr>
<td>Rogers Creek (Part of Hayward Fault System)</td>
<td>35 miles from South San Francisco</td>
</tr>
</tbody>
</table>

San Andreas Fault

The San Andreas Fault is a transform boundary that spans approximately 810 miles from the East Pacific rise in the Gulf of California through the Mendocino fracture zone off of the shore of northern California. The fault is estimated to be 28 million years old. The San Andreas Fault is an example of a transform boundary exposed on a continent. The fault forms the tectonic boundary between the Pacific Plate and the North American Plate, and its motion is right-lateral strike-slip.
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-percent – significantly less than San Andreas Fault or Hayward Fault. However, the location of the fault poses a significant threat to San Mateo County.

Maps of Earthquake Impact in San Mateo County

Identifying the extent and location of an earthquake is not as simple as it is for other hazards such as flood, landslide or wildfire. The impact of an earthquake is largely a function of the following components:

- Ground shaking (ground motion accelerations)
- Liquefaction (soil instability)
- Distance from the source (both horizontally and vertically).

Mapping that shows the impacts of these components was used to assess the risk of earthquakes within the planning area. While the impacts from each of these components can build upon each other during an earthquake event, the mapping looks at each component individually. The mapping used in this assessment is described below.

Shake Maps

A shake map is a representation of ground shaking produced by an earthquake. The information it presents is different from the earthquake magnitude and epicenter that are released after an earthquake because shake maps focus on the ground shaking resulting from the earthquake, rather than on the parameters describing the earthquake source. An earthquake has only one magnitude and one epicenter, but it produces a range of ground shaking at sites throughout the region, depending on the distance from the earthquake, the rock and soil conditions at the various sites, and variations in the propagation of seismic waves from the earthquake created by complexities in the structure of the earth’s crust. A shake map shows the extent and variation of ground shaking in a region immediately after significant earthquakes.

Ground motion and intensity maps are derived from peak ground motion amplitudes recorded on seismic sensors (accelerometers), with interpolation based on estimated amplitudes where data are lacking, and site amplification corrections. Color-coded instrumental intensity maps are derived from empirical relations between peak ground motions and Modified Mercalli intensity.

A probabilistic seismic hazard map shows the hazard from earthquakes that geologists and seismologists agree could occur. The maps are expressed in terms of probability of exceeding a certain ground motion, such as the 10-percent probability of exceedance in 50 years. This level of ground shaking has been used for designing buildings in high seismic areas. Figures 5-3 and 5-4 show the estimated ground motion for the 100-year and 500-year probabilistic earthquakes in San Mateo County.

Earthquake scenario maps describe the expected ground motions and effects of hypothetical large earthquakes for a region. Maps of these scenarios can be used to support all phases of emergency management. Two scenarios were chosen by the Steering Committee for this plan:

- A Magnitude-7.8 event on the San Andreas Fault with an epicenter approximately 138 miles northwest of the City of San Mateo.
A Magnitude-7.5 event on the San Gregorio Fault with an epicenter approximately 85 miles south southeast of the City of San Mateo.

**NEHRP Soil Maps**

NEHRP soil types define the locations that will be significantly affected by an earthquake. NEHRP Soils B and C typically can sustain low-magnitude ground shaking without much effect. The areas that are most commonly affected by ground shaking have NEHRP Soils D, E and F. Figure 5-7 shows NEHRP soil classifications in the county.

**Liquefaction Maps**

Liquefaction involves loose sandy soil with a high water content that undermines the ground’s ability to solidly support building structures during an earthquake. Foundations supported on liquefiable soils can lose their ability to support load and can experience settlement on the order of several inches or more. Differential settlement can cause significant damage to buildings, lifelines, and transportation structures, with partial or total collapse.

Soil liquefaction maps are useful tools to assess potential damage from earthquakes. When the ground liquefies, sandy or silty materials saturated with water behave like a liquid, causing pipes to leak, roads and airport runways to buckle, and building foundations to be damaged. In general, areas with NEHRP Soils D, E and F are also susceptible to liquefaction. If there is a dry soil crust, excess water will sometimes come to the surface through cracks in the confining layer, bringing liquefied sand with it, creating sand boils. Figure 5-8 shows the liquefaction susceptibility in the planning area.

**Alquist-Priolo Zone Maps**

The sudden sliding of one part of the earth’s crust past another releases the vast store of elastic energy in the rocks as an earthquake. The resulting fracture is known as a fault, while the sliding movement of earth on either side of a fault is called fault rupture. Fault rupture begins below the ground surface at the earthquake hypocenter, typically between 3 and 10 miles below the ground surface in California. If an earthquake is large enough, the fault rupture will actually travel to the ground surface, potentially destroying structures built across its path (SHMP 2013).

Alquist-Priolo (AP) Zone Maps provide regulatory zones for potential surface fault rupture where fault lines intersect with future development and populated areas. The purpose of these maps is to assist in the geologic investigation before construction begins to ensure that the resulting structure will not be located on an active fault. Daly City and San Bruno are located in designated AP Zones for the San Andreas Fault.

AP Maps were referenced, but not specifically used, in the assessment of risk for this plan as a result of the existence of current extensive studies and regulations and ongoing monitoring and update of AP Zones by the State of California. This plan assumes that the studies conducted and information provided by the State of California are the best available data for surface rupture risk and could not be improved through a separate assessment for this plan. AP Maps are available to the public at:

5.2.3 Frequency

California experiences hundreds of earthquakes each year, most with minimal damage and magnitudes below 3.0 on the Richter Scale. Earthquakes that cause moderate damage to structures occur several times a year. According to the USGS, a strong earthquake measuring greater than 5.0 on the Richter Scale occurs every 2 to 3 years and major earthquakes of more than 7.0 on the Richter Scale occur once a decade. Both the San Andreas and the Hayward Faults have the potential for experiencing major to great events. The USGS estimated in 2008 that there is a 63 percent probability of at least one 6.7 or greater magnitude earthquake before 2036 that could cause widespread damage in the San Francisco Bay area. The State Hazard Mitigation Plan cites projections that there is more than a 99-percent probability of a magnitude 6.7 earthquake in California in the next 30 years and a 94-percent magnitude 7.0 earthquake in California in the next 30 years.

Probabilities for earthquakes on individual faults until 2036 have been estimated by USGS, as shown in Table 5-7, which also shows estimates for average long-term movement (“slip rate”) of each fault in millimeters per year (mm/year).

<table>
<thead>
<tr>
<th>Table 5-7: Earthquake Probabilities and Slip Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Segment</strong></td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>San Andreas</td>
</tr>
<tr>
<td>Santa Cruz Mountains (SAS)</td>
</tr>
<tr>
<td>Peninsula (SAP)</td>
</tr>
<tr>
<td>North Bay (SAN)</td>
</tr>
<tr>
<td>Ocean (north of Bay Area - SAO)</td>
</tr>
<tr>
<td>South Bay Segments (SAS + SAP)</td>
</tr>
<tr>
<td>Central Bay Segments (SAP + SAN)</td>
</tr>
<tr>
<td>Northern Segments (SAN + SAO)</td>
</tr>
<tr>
<td>Bay Area Segments (SAS+SAP+SAN)</td>
</tr>
<tr>
<td>Central + North (SAP + SAN +SAO)</td>
</tr>
<tr>
<td>Entire - Repeat of 1906(SAS + SAP +SAN + SAO)</td>
</tr>
<tr>
<td>Floating M6.9</td>
</tr>
<tr>
<td>San Gregorio</td>
</tr>
<tr>
<td>Southern (Outside Bay Area - SGS)</td>
</tr>
<tr>
<td>Northern (SGN)</td>
</tr>
<tr>
<td>SGS + SGN</td>
</tr>
<tr>
<td>Floating M6.9</td>
</tr>
<tr>
<td>Hayward/Rodgers Creek</td>
</tr>
<tr>
<td>Southern (HS)</td>
</tr>
<tr>
<td>Northern (HN)</td>
</tr>
<tr>
<td>Entire (HS + HN)</td>
</tr>
<tr>
<td>Rodgers Creek (RC)</td>
</tr>
<tr>
<td>HN + RC</td>
</tr>
</tbody>
</table>
## Table 5-7. Earthquake Probabilities and Slip Rates

<table>
<thead>
<tr>
<th>Segment</th>
<th>Average Long Term Slip Rate</th>
<th>% Probability in Next 30 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Characteristic Quake 2002-2031</td>
<td>Quake (&gt;6.7) 2007-2036</td>
</tr>
<tr>
<td>HS + HN + RC</td>
<td>9</td>
<td>1.0</td>
</tr>
<tr>
<td>Floating M6.9</td>
<td>9</td>
<td>0.7</td>
</tr>
<tr>
<td>Calaveras</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern (Outside Bay Area - CS)</td>
<td>15</td>
<td>21.3</td>
</tr>
<tr>
<td>Central (CC)</td>
<td>15</td>
<td>13.8</td>
</tr>
<tr>
<td>CS + CC</td>
<td>15</td>
<td>5.0</td>
</tr>
<tr>
<td>Northern (CN)</td>
<td>6</td>
<td>12.4</td>
</tr>
<tr>
<td>CC + CN</td>
<td>6-15</td>
<td>0.3</td>
</tr>
<tr>
<td>CS + CC + CN</td>
<td>6-15</td>
<td>2.0</td>
</tr>
<tr>
<td>Floating M6.2</td>
<td>6-15</td>
<td>7.4</td>
</tr>
<tr>
<td>Floating M6.2 on CS + CC</td>
<td>15</td>
<td>7.4</td>
</tr>
<tr>
<td>Concord/Green Valley</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concord (CON)</td>
<td>4</td>
<td>5.0</td>
</tr>
<tr>
<td>Southern Green Valley (GVS)</td>
<td>5</td>
<td>2.3</td>
</tr>
<tr>
<td>CON + GVS</td>
<td>4-5</td>
<td>1.6</td>
</tr>
<tr>
<td>Northern Green Valley (GVN)</td>
<td>5</td>
<td>6.1</td>
</tr>
<tr>
<td>Entire Green Valley (GVS + GVN)</td>
<td>5</td>
<td>3.2</td>
</tr>
<tr>
<td>Entire (CON + GVS + GVN)</td>
<td>4-5</td>
<td>6.0</td>
</tr>
<tr>
<td>Floating M6.2</td>
<td>4-5</td>
<td>6.2</td>
</tr>
<tr>
<td>Greenville</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern (GS)</td>
<td>2</td>
<td>3.1</td>
</tr>
<tr>
<td>Northern (GN)</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>Entire (GS + GN)</td>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td>Floating M6.2</td>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>Mount Diablo Thrust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mount Diablo Thrust (MDT)</td>
<td>2</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Based on USGS Working Group on Earthquake Probabilities. 2003 and 2008*

*Based on USGS Working Group on Earthquake Probabilities. 2003 and 2008*
FIGURE 5-3. 100-YEAR PROBABILISTIC PGA

100-Yr Probabilistic Earthquake Peak Ground Acceleration

Incorporated Cities

Mercalli Scale (Potential Damage)
- VII (Moderate)
- VIII (Moderate/Heavy)

Data Sources: San Mateo County, Hazard-MF
Figure 5-4. 500-Year Probabilistic PGA

Data Sources: San Mateo County, Hazus MH
SECTION 2 - Chapter 5
Earthquake

FIGURE 5-5. SAN ANDREAS FAULT SCENARIO PGA

Northern San Andreas M7.8 Scenario
Peak Ground Acceleration

Incorporated Cities
Mercalli Scale (Potential Damage)
VII (Moderate)
VIII (Moderate/Heavy)

Data Sources: San Mateo County, U.S. Geological Survey

0 1 2 4 Miles
FIGURE 5-6. SAN GREGORIO FAULT SCENARIO PGA
Figure 5-7. National Earthquake Hazard Reduction Program - Soil Classification

National Earthquake Hazards Reduction Program (NEHRP) Soil Classification

- Incorporated Cities
- Site Class
  - B: Rock
  - C: Very dense soil, soft rock
  - D: Stiff soil
  - E: Soft soil

Data Sources: San Mateo County, California Department of Conservation

0 1 2 4 Miles
FIGURE 5-8. LIQUEFACTION SUSCEPTIBILITY

Liquefaction Susceptibility

Incorporated Cities

Liquefaction Susceptibility:
1 - Very Low
2 - Low
3 - Moderate
4 - High
5 - Very High

Data Sources:
San Mateo County,
Association of Bay Area Governments,
5.2.4 Severity

The severity of an earthquake can be expressed in terms of intensity or magnitude:

- Intensity represents the observed effects of ground shaking at any specified location. The intensity of earthquake shaking lessens with distance from the earthquake epicenter. Tabulated peak ground accelerations for a listed “maximum credible earthquakes” (MCE) are a measure of how a site will be affected by seismic events on distant faults.
- Magnitude represents the amount of seismic energy released at the hypocenter of the earthquake. It is based on the amplitude of the earthquake waves recorded on instruments. Magnitude is thus represented by a single, instrumentally determined value.

ABAG estimates a potential loss of 159,000 housing units in Bay Area communities after a large earthquake. This loss would have disastrous effects on local and regional economies. It also means that recovery, repair, and rebuilding time for each household would be very lengthy because of the number of homes that would need repairs or replacement.

5.2.5 Warning Time

There is no current reliable way to predict the day or month that an earthquake will occur at any given location. Research is being done with warning systems that use the low energy waves that precede major earthquakes. These potential warning systems would give approximately 40 seconds notice that a major earthquake is about to occur. The warning time is very short, but it could allow for someone to get under a desk, step away from a hazardous material, or shut down a computer system.

5.3 Secondary Hazards

Earthquakes can cause large and sometimes disastrous landslides and mudslides. River valleys are vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. Soil liquefaction occurs when water-saturated sands, silts, or gravelly soils are shaken so violently that the individual grains lose contact with one another and “float” freely in the water, turning the ground into a pudding-like liquid. Building and road foundations lose load-bearing strength and may sink quicksand-like into what was previously solid ground. Unless properly secured, hazardous materials can be released, causing significant damage to the environment and people.

Earthen dams and levees are highly susceptible to seismic events, and the impacts of their eventual failures can be considered secondary risk exposure to earthquakes. Depending on the location, earthquakes can also trigger tsunamis. Tsunamis significantly damage many locations beyond what the earthquake struck; however, coastal communities near the earthquake epicenter that are also vulnerable to tsunamis could experience devastating impacts. See Chapter 9 of this section for more information on the County’s vulnerability to tsunamis. Additionally, fires can result from gas lines or power lines that are broken or downed during the earthquake. It may be difficult to control a fire, particularly if the water lines feeding fire hydrants are also broken. After the 1906 earthquake in San Francisco, for example, a fire burned for 3 days, destroying much of the city and leaving 250,000 people homeless (UPSeis n.d.).
5.4 Exposure

5.4.1 Population

San Mateo County has a quickly growing population, with an estimated 753,123 residents as of January 1, 2015. All of this population would be considered exposed to the potential impacts of an earthquake, either directly or indirectly. The degree of exposure depends on many factors, including the age and construction type of the structures where people live, the soil type their homes are constructed on, and their proximity to the fault. Whether directly or indirectly impacted, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of functions of utilities could affect populations that suffered no direct damage from an event itself.

5.4.2 Property

According to County Assessor records, there are 207,020 assessment parcels in the planning area, with a total assessed value of more than $319.86 billion. Since all structures in the planning area are susceptible to earthquake impacts to varying degrees, this total represents the countywide property exposure to seismic events. Most of the buildings (95 percent) are residential.

5.4.3 Critical Facilities

All critical facilities in San Mateo County are exposed to the earthquake hazard. Table 5-8 shows the number of each type of facility by jurisdiction.

<table>
<thead>
<tr>
<th>TABLE 5-8. CRITICAL FACILITIES IN THE PLANNING AREAS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medical and</strong></td>
</tr>
<tr>
<td><strong>Health</strong></td>
</tr>
<tr>
<td><strong>Services</strong></td>
</tr>
<tr>
<td>Atherton</td>
</tr>
<tr>
<td>Belmont</td>
</tr>
<tr>
<td>Brisbane</td>
</tr>
<tr>
<td>Burlingame</td>
</tr>
<tr>
<td>Colma</td>
</tr>
<tr>
<td>Daly City</td>
</tr>
<tr>
<td>East Palo Alto</td>
</tr>
<tr>
<td>Foster City</td>
</tr>
<tr>
<td>Half Moon Bay</td>
</tr>
<tr>
<td>Hillsborough</td>
</tr>
<tr>
<td>Menlo Park</td>
</tr>
<tr>
<td>Millbrae</td>
</tr>
<tr>
<td>Pacifica</td>
</tr>
<tr>
<td>Portola Valley</td>
</tr>
</tbody>
</table>
TABLE 5-8. CRITICAL FACILITIES IN THE PLANNING AREAS

<table>
<thead>
<tr>
<th></th>
<th>Medical and Health Services</th>
<th>Emergency Services</th>
<th>Government</th>
<th>Utilities</th>
<th>Hazardous Materials</th>
<th>Community Economic Facilities</th>
<th>Other Assets</th>
<th>Total</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redwood City</td>
<td>2</td>
<td>7</td>
<td>11</td>
<td>37</td>
<td>34</td>
<td>10</td>
<td>9</td>
<td>24</td>
<td>134</td>
</tr>
<tr>
<td>San Bruno</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>30</td>
<td>2</td>
<td>3</td>
<td>17</td>
<td>58</td>
</tr>
<tr>
<td>San Carlos</td>
<td>0</td>
<td>3</td>
<td>7</td>
<td>18</td>
<td>8</td>
<td>16</td>
<td>6</td>
<td>10</td>
<td>68</td>
</tr>
<tr>
<td>San Mateo</td>
<td>2</td>
<td>7</td>
<td>2</td>
<td>19</td>
<td>57</td>
<td>1</td>
<td>8</td>
<td>32</td>
<td>128</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>19</td>
<td>38</td>
<td>14</td>
<td>13</td>
<td>18</td>
<td>111</td>
</tr>
<tr>
<td>Woodside</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>1</td>
<td>13</td>
<td>4</td>
<td>32</td>
<td>117</td>
<td>5</td>
<td>2</td>
<td>27</td>
<td>201</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>81</strong></td>
<td><strong>50</strong></td>
<td><strong>188</strong></td>
<td><strong>412</strong></td>
<td><strong>71</strong></td>
<td><strong>103</strong></td>
<td><strong>269</strong></td>
<td><strong>1,184</strong></td>
</tr>
</tbody>
</table>

5.4.4 Environment

Environmental problems as a result of an earthquake can be numerous. Secondary hazards will likely have some of the most damaging effects on the environment. Earthquake-induced landslides in landslide-prone areas can significantly damage surrounding habitat. It is also possible for streams to be rerouted after an earthquake. Rerouting can change the water quality, possibly damaging habitat and feeding areas. There is a possibility that streams fed by groundwater wells will dry up because of changes in underlying geology.

5.5 Vulnerability

Earthquake vulnerability data was generated using a Level 2 HAZUS-MH analysis. Once the location and size of a hypothetical earthquake are identified, HAZUS-MH estimates the intensity of the ground shaking, the number of buildings damaged, the damage to critical facilities and infrastructure, the number of people displaced from their homes, and additional information that can be used to estimate the cost of repair and clean up.

5.5.1 Population

There are estimated to be 297,452 people in 107,000 households living on soils with moderate to very high liquefaction potential in the planning area, or about 42 percent of the total population. Two groups are particularly vulnerable to earthquake hazards:

- **Population below Poverty Level**—An estimated 10,546 households in the planning area census blocks with moderate to very high liquefaction potential soils have household incomes less than $20,000 per year. This number is about 9.9 percent of all households located on moderate to very high liquefaction potential soils. These households may lack the financial resources to improve their homes to prevent or mitigate earthquake damage. Economically disadvantaged residents are also less likely to have insurance to compensate for losses in earthquakes.

- **Population over 65 Years Old**—An estimated 33,007 residents in the planning area census blocks with moderate to very high liquefaction potential soils are over 65 years old, or about 11.1 percent
of all residents located on moderate to very high liquefaction potential soils. This population group is vulnerable because they are more likely to need special medical attention, which may not be available because of the isolation caused by earthquakes. Elderly residents also have more difficulty leaving their homes during earthquake events and could be stranded in dangerous situations.

Impacts on persons and households in the planning area were estimated for the 100-year and 500-year earthquakes and the two scenario events through the Level 2 HAZUS-MH analysis. Table 5-9 summarizes the results.

### TABLE 5-9. ESTIMATED EARTHQUAKE IMPACT ON PERSONS AND HOUSEHOLDS

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Number of Households Displaced</th>
<th>Number of Persons Requiring Short-Term Shelter</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-Year Earthquake</td>
<td>3,696</td>
<td>2,221</td>
</tr>
<tr>
<td>500-Year Earthquake</td>
<td>22,949</td>
<td>13,268</td>
</tr>
<tr>
<td>Northern San Andreas Scenario, M7.5</td>
<td>2,363</td>
<td>1,337</td>
</tr>
<tr>
<td>San Gregorio Scenario, M7.8</td>
<td>9,463</td>
<td>5,342</td>
</tr>
</tbody>
</table>

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

#### 5.5.2 Property

**Building Age**

Table 5-10 identifies significant milestones in building and seismic code requirements that directly affect the structural integrity of development. Using these time periods, the planning team used San Mateo County assessor’s data to identify the number of structures in the planning area by date of construction. The number of structures does not reflect the number of total housing units, as many multi-family units and attached housing units are reported as one structure.

### TABLE 5-10. AGE OF STRUCTURES IN SAN MATEO COUNTY

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Number of Current County Structures Built in Period</th>
<th>Significance of Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-1933</td>
<td>15,734</td>
<td>Before 1933, there were no explicit earthquake requirements in building codes. State law did not require local governments to have building officials or issue building permits.</td>
</tr>
<tr>
<td>1933-1940</td>
<td>10,219</td>
<td>In 1940, the first strong motion recording was made.</td>
</tr>
<tr>
<td>1941-1960</td>
<td>85,564</td>
<td>In 1960, the Structural Engineers Association of California published guidelines on recommended earthquake provisions.</td>
</tr>
<tr>
<td>1961-1975</td>
<td>50,384</td>
<td>In 1975, significant improvements were made to lateral force requirements.</td>
</tr>
<tr>
<td>1976-1994</td>
<td>29,495</td>
<td>In 1994, the Uniform Building Code was amended to include provisions for seismic safety.</td>
</tr>
<tr>
<td>1995- Present</td>
<td>15,624</td>
<td>Seismic code is currently enforced.</td>
</tr>
</tbody>
</table>
### Table 5-10. Age of Structures in San Mateo County

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Number of Current County Structures Built in Period</th>
<th>Significance of Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>207,020</td>
<td></td>
</tr>
</tbody>
</table>

**Soft-Story Buildings**

A soft-story building is a multi-story building with one or more floors that are “soft” because of structural design. If a building has a floor that is 70-percent less stiff than the floor above it, it is considered a soft-story building. This soft story creates a major weak point in an earthquake. Since soft stories are typically associated with retail spaces and parking garages, they are often on the lower stories of a building. When they collapse, they can take the whole building down with them, causing serious structural damage that may render the structure totally unusable.

These floors can be especially dangerous in earthquakes because they cannot cope with the lateral forces caused by the swaying of the building during a quake. As a result, the soft story may fail, causing what is known as a soft-story collapse. Soft-story collapse is one of the leading causes of earthquake damage to private residences.

Exposure rates and vulnerability analysis associated with soft-story construction in the planning area are not currently known. ABAG and other agencies in the Bay Area have programs generating this type of data, but it is not known when such data will be available for San Mateo County. This type of data will need to be generated to support future risk assessments of the earthquake hazard.

**Unreinforced Masonry Buildings**

Unreinforced masonry (URM) buildings are constructed from materials such as adobe, brick, hollow clay tiles, or other masonry materials and do not contain an internal reinforcing structure, such as rebar in concrete or steel bracing for brick. URM poses a significant danger during an earthquake because the mortar holding masonry together is typically not strong enough to withstand significant earthquakes. Additionally, the brittle composition of these houses can break apart and fall away or buckle, potentially causing a complete collapse of the building.

In San Mateo County, URMs are generally brick buildings that were constructed before modern earthquake building codes and designs were enacted. The State of California enacted a law in 1986 that required all local governments in Seismic Zone 4 (nearest to active earthquake faults) to inventory URMs. The law encourages local governments to adopt local mandatory strengthening programs, delineate seismic retrofit standards, and put into place measures to reduce the number of people in URMs.

According to ABAG, housing units in URM buildings account for only 1-percent of the total Bay Area housing stock and 2.9-percent of the total Bay Area multi-family stock.
Loss Potential

Property losses were estimated through the Level 2 HAZUS-MH analysis for the 100-year and 500-year earthquakes and the two scenario events. Tables 5-11 through 5-14 show the results for two types of property loss:

- Structural loss, representing damage to building structures
- Non-structural loss, representing only the value of lost contents and inventory

The total of the two types of losses is also shown in the tables. A summary of the property-related loss results is as follows:

- For a 100-year probabilistic earthquake, the estimated damage potential is $15.3 billion, or 4.8 percent of the total assessed value for the planning area.
- For a 500-year earthquake, the estimated damage potential is $69 billion, or 21.6 percent of the total assessed value for the planning area.
- For a 7.5-magnitude event on the San Gregorio Fault, the estimated damage potential is $12.1 billion, or 3.8 percent of the total assessed value for the planning area.
- For a 7.8-magnitude event on the Northern San Andreas Fault, the estimated damage potential is $39.7 billion, or 12.4 percent of the total assessed value for the planning area.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Estimated Loss Associated with Earthquake</th>
<th>% of Total Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Structure</td>
<td>Contents</td>
</tr>
<tr>
<td>Atherton</td>
<td>$113,976,023</td>
<td>$34,655,155</td>
</tr>
<tr>
<td>Belmont</td>
<td>$215,989,637</td>
<td>$73,959,552</td>
</tr>
<tr>
<td>Brisbane</td>
<td>$100,320,140</td>
<td>$30,642,542</td>
</tr>
<tr>
<td>Burlingame</td>
<td>$830,147,394</td>
<td>$258,596,435</td>
</tr>
<tr>
<td>Colma</td>
<td>$116,760,992</td>
<td>$33,918,847</td>
</tr>
<tr>
<td>Daly City</td>
<td>$830,626,158</td>
<td>$236,341,837</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>$574,883,497</td>
<td>$184,501,244</td>
</tr>
<tr>
<td>Foster City</td>
<td>$401,940,879</td>
<td>$121,004,017</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>$112,993,953</td>
<td>$38,990,315</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>$62,689,622</td>
<td>$20,459,421</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>$722,405,057</td>
<td>$265,933,300</td>
</tr>
<tr>
<td>Millbrae</td>
<td>$299,930,363</td>
<td>$91,684,803</td>
</tr>
<tr>
<td>Pacifica</td>
<td>$236,152,220</td>
<td>$77,139,150</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>$69,329,270</td>
<td>$24,064,782</td>
</tr>
<tr>
<td>Redwood City</td>
<td>$1,411,640,567</td>
<td>$457,666,205</td>
</tr>
<tr>
<td>San Bruno</td>
<td>$652,442,245</td>
<td>$193,894,624</td>
</tr>
<tr>
<td>San Carlos</td>
<td>$707,967,434</td>
<td>$241,372,711</td>
</tr>
<tr>
<td>San Mateo</td>
<td>$1,734,702,671</td>
<td>$537,471,359</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>$1,479,545,072</td>
<td>$522,703,432</td>
</tr>
<tr>
<td>Woodside</td>
<td>$36,124,040</td>
<td>$14,370,184</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>$844,682,697</td>
<td>$284,270,041</td>
</tr>
</tbody>
</table>
### TABLE 5-11. LOSS ESTIMATES FOR 100-YEAR PROBABILISTIC EARTHQUAKE

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Estimated Loss Associated with Earthquake</th>
<th>% of Total Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Structure</td>
<td>Contents</td>
</tr>
<tr>
<td>Total</td>
<td>$11,555,249,930</td>
<td>$3,743,639,956</td>
</tr>
</tbody>
</table>

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

### TABLE 5-12. LOSS ESTIMATES FOR 500-YEAR PROBABILISTIC EARTHQUAKES

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Estimated Loss Associated with Earthquake</th>
<th>% of Total Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Structure</td>
<td>Contents</td>
</tr>
<tr>
<td>Atherton</td>
<td>$492,651,511</td>
<td>$149,187,781</td>
</tr>
<tr>
<td>Belmont</td>
<td>$1,311,375,811</td>
<td>$433,979,457</td>
</tr>
<tr>
<td>Brisbane</td>
<td>$703,014,180</td>
<td>$235,335,025</td>
</tr>
<tr>
<td>Burlingame</td>
<td>$3,690,729,606</td>
<td>$1,207,715,662</td>
</tr>
<tr>
<td>Colma</td>
<td>$590,188,366</td>
<td>$205,153,676</td>
</tr>
<tr>
<td>Daly City</td>
<td>$4,716,950,229</td>
<td>$1,524,747,713</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>$1,179,253,320</td>
<td>$397,905,279</td>
</tr>
<tr>
<td>Foster City</td>
<td>$1,126,082,890</td>
<td>$354,110,537</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>$1,004,113,335</td>
<td>$332,806,898</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>$436,829,316</td>
<td>$133,799,812</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>$2,340,895,894</td>
<td>$850,331,931</td>
</tr>
<tr>
<td>Millbrae</td>
<td>$1,597,406,949</td>
<td>$518,706,860</td>
</tr>
<tr>
<td>Pacifica</td>
<td>$1,651,528,201</td>
<td>$540,944,605</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>$357,840,718</td>
<td>$123,558,911</td>
</tr>
<tr>
<td>Redwood City</td>
<td>$5,676,232,334</td>
<td>$1,947,526,468</td>
</tr>
<tr>
<td>San Bruno</td>
<td>$3,344,158,019</td>
<td>$1,104,422,687</td>
</tr>
<tr>
<td>San Carlos</td>
<td>$3,246,525,158</td>
<td>$1,204,297,786</td>
</tr>
<tr>
<td>San Mateo</td>
<td>$6,808,844,339</td>
<td>$2,213,630,327</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>$6,424,306,423</td>
<td>$2,458,427,019</td>
</tr>
<tr>
<td>Woodside</td>
<td>$254,108,353</td>
<td>$88,027,367</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>$4,470,287,731</td>
<td>$1,561,647,690</td>
</tr>
<tr>
<td>Total</td>
<td>$51,423,322,684</td>
<td>$17,586,263,491</td>
</tr>
</tbody>
</table>

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

### TABLE 5-13. LOSS ESTIMATES FOR SAN GREGORIO, M7.5

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Estimated Loss Associated with Earthquake</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Structure</td>
<td>Contents</td>
</tr>
<tr>
<td>Atherton</td>
<td>$19,677,204</td>
<td>$9,684,580</td>
</tr>
<tr>
<td>Belmont</td>
<td>$93,048,949</td>
<td>$36,404,058</td>
</tr>
<tr>
<td>Brisbane</td>
<td>$189,625,154</td>
<td>$40,362,281</td>
</tr>
<tr>
<td>Burlingame</td>
<td>$958,824,187</td>
<td>$273,574,191</td>
</tr>
</tbody>
</table>
### Table 5-13. Loss Estimates for San Gregorio, M7.5

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Structure</th>
<th>Contents</th>
<th>Total</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colma</td>
<td>$89,806,293</td>
<td>$22,071,616</td>
<td>$111,877,909</td>
<td>4.8%</td>
</tr>
<tr>
<td>Daly City</td>
<td>$650,745,323</td>
<td>$172,509,268</td>
<td>$823,254,591</td>
<td>3.3%</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>$112,655,019</td>
<td>$39,250,478</td>
<td>$151,905,497</td>
<td>2.6%</td>
</tr>
<tr>
<td>Foster City</td>
<td>$267,624,614</td>
<td>$76,132,863</td>
<td>$343,757,477</td>
<td>4.2%</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>$278,383,417</td>
<td>$76,831,533</td>
<td>$355,214,950</td>
<td>4.5%</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>$38,053,962</td>
<td>$15,772,284</td>
<td>$53,826,246</td>
<td>1.1%</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>$129,358,772</td>
<td>$60,182,147</td>
<td>$189,540,919</td>
<td>1.0%</td>
</tr>
<tr>
<td>Millbrae</td>
<td>$331,905,526</td>
<td>$15,772,284</td>
<td>$347,677,810</td>
<td>2.6%</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>$17,519,880</td>
<td>$9,485,495</td>
<td>$27,005,376</td>
<td>1.0%</td>
</tr>
<tr>
<td>Redwood City</td>
<td>$791,008,476</td>
<td>$1,013,031,328</td>
<td>$1,013,031,328</td>
<td>2.8%</td>
</tr>
<tr>
<td>San Bruno</td>
<td>$656,888,038</td>
<td>$172,089,231</td>
<td>$828,977,269</td>
<td>4.8%</td>
</tr>
<tr>
<td>San Carlos</td>
<td>$309,394,109</td>
<td>$101,122,441</td>
<td>$410,516,550</td>
<td>2.0%</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>$1,138,513,114</td>
<td>$312,269,561</td>
<td>$1,450,782,676</td>
<td>3.3%</td>
</tr>
<tr>
<td>Woodside</td>
<td>$17,519,880</td>
<td>$9,485,495</td>
<td>$27,005,376</td>
<td>1.0%</td>
</tr>
<tr>
<td>Total</td>
<td>$9,292,523,842</td>
<td>$2,825,511,298</td>
<td>$12,118,035,139</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

### Table 5-14. Loss Estimates for San Andreas, M7.8

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Structure</th>
<th>Contents</th>
<th>Total</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>$152,011,769</td>
<td>$45,401,160</td>
<td>$197,412,929</td>
<td>5.1%</td>
</tr>
<tr>
<td>Belmont</td>
<td>$601,637,193</td>
<td>$186,594,479</td>
<td>$788,231,672</td>
<td>7.6%</td>
</tr>
<tr>
<td>Brisbane</td>
<td>$317,029,327</td>
<td>$76,750,817</td>
<td>$393,780,144</td>
<td>9.3%</td>
</tr>
<tr>
<td>Burlingame</td>
<td>$2,712,532,551</td>
<td>$835,718,453</td>
<td>$3,548,251,004</td>
<td>16.6%</td>
</tr>
<tr>
<td>Colma</td>
<td>$326,424,256</td>
<td>$96,502,478</td>
<td>$422,926,734</td>
<td>18.2%</td>
</tr>
<tr>
<td>Daly City</td>
<td>$2,538,674,418</td>
<td>$704,045,022</td>
<td>$3,242,719,440</td>
<td>13.0%</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>$546,342,364</td>
<td>$169,695,479</td>
<td>$716,037,843</td>
<td>12.2%</td>
</tr>
<tr>
<td>Foster City</td>
<td>$867,051,330</td>
<td>$265,023,822</td>
<td>$1,132,075,152</td>
<td>13.8%</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>$304,208,876</td>
<td>$89,851,951</td>
<td>$394,060,826</td>
<td>5.0%</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>$265,482,123</td>
<td>$79,246,720</td>
<td>$344,728,843</td>
<td>7.3%</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>$775,145,560</td>
<td>$272,064,609</td>
<td>$1,047,210,169</td>
<td>16.2%</td>
</tr>
<tr>
<td>Millbrae</td>
<td>$1,217,987,732</td>
<td>$366,606,664</td>
<td>$1,584,594,396</td>
<td>8.8%</td>
</tr>
<tr>
<td>Pacifica</td>
<td>$750,537,178</td>
<td>$224,876,654</td>
<td>$975,413,832</td>
<td>10.7%</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>$218,798,422</td>
<td>$71,829,801</td>
<td>$290,628,224</td>
<td>10.7%</td>
</tr>
</tbody>
</table>
TABLE 5-14. LOSS ESTIMATES FOR SAN ANDREAS, M7.8

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Estimated Loss Associated with Earthquake</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Structure</td>
<td>Contents</td>
</tr>
<tr>
<td>Redwood City</td>
<td>$3,134,686,143</td>
<td>$970,446,457</td>
</tr>
<tr>
<td>San Bruno</td>
<td>$2,523,134,653</td>
<td>$770,712,070</td>
</tr>
<tr>
<td>San Carlos</td>
<td>$2,064,220,283</td>
<td>$711,285,669</td>
</tr>
<tr>
<td>San Mateo</td>
<td>$4,177,042,528</td>
<td>$1,231,790,690</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>$4,799,981,960</td>
<td>$1,712,950,502</td>
</tr>
<tr>
<td>Woodside</td>
<td>$143,477,344</td>
<td>$50,405,067</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>$1,808,170,691</td>
<td>$566,788,321</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$30,244,376,700</strong></td>
<td><strong>$9,498,589,003</strong></td>
</tr>
</tbody>
</table>

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

**Earthquake-Caused Debris**

The HAZUS-MH analysis estimated the amount of earthquake-caused debris in the planning area for the 100-year and 500-year earthquakes and the two scenario events, as summarized in Table 5-15.

TABLE 5-15. ESTIMATED EARTHQUAKE-CAUSED DEBRIS

<table>
<thead>
<tr>
<th>Event</th>
<th>Debris to Be Removed (tons)</th>
<th>Estimated Number of Truckloads</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-Year Earthquake</td>
<td>4,202,544</td>
<td>168,102</td>
</tr>
<tr>
<td>500-Year Earthquake</td>
<td>18,214,779</td>
<td>728,591</td>
</tr>
<tr>
<td>Northern San Andreas Scenario, M7.5</td>
<td>3,708,560</td>
<td>148,342</td>
</tr>
<tr>
<td>San Gregorio Scenario, M7.8</td>
<td>12,012,789</td>
<td>480,512</td>
</tr>
</tbody>
</table>

a. Debris generation estimates were based on updated general building stock dataset at a Census Tract analysis level.
b. Hazus-MH assumes 25 tons/trucks

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

**5.5.3 Critical Facilities**

**Level of Damage**

HAZUS-MH classifies the vulnerability of critical facilities to earthquake damage in five categories: no damage, slight damage, moderate damage, extensive damage, or complete damage. The model was used to assign a vulnerability category to each critical facility in the planning area. The analysis was performed for the 100-Year Probabilistic, 500-Year Probabilistic, San Gregorio M 7.5 and N San Andreas M 7.8 events. Results are summarized in Table 5-16 through Table 5-19.

TABLE 5-16. ESTIMATED DAMAGE TO CRITICAL FACILITIES FROM 100-YEAR PROBABILISTIC EARTHQUAKE

<table>
<thead>
<tr>
<th>Category</th>
<th>Damage Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
</tr>
<tr>
<td>Medical and Health Services</td>
<td>74.59</td>
</tr>
</tbody>
</table>
### Table 5-16. Estimated Damage to Critical Facilities from 100-Year Probabilistic Earthquake

<table>
<thead>
<tr>
<th>Category</th>
<th>Damage Extent</th>
<th>None</th>
<th>Slight</th>
<th>Moderate</th>
<th>Extensive</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Services</td>
<td></td>
<td>59.75</td>
<td>25.99</td>
<td>6.90%</td>
<td>0.33</td>
<td>7.01</td>
</tr>
<tr>
<td>Government</td>
<td></td>
<td>25.43</td>
<td>21.99</td>
<td>29.65%</td>
<td>13.40</td>
<td>9.51</td>
</tr>
<tr>
<td>Utilities</td>
<td></td>
<td>17.98</td>
<td>39.77</td>
<td>31.36%</td>
<td>7.61</td>
<td>3.27</td>
</tr>
<tr>
<td>Transportation Infrastructure</td>
<td></td>
<td>67.34</td>
<td>13.66</td>
<td>3.63%</td>
<td>5.59</td>
<td>9.75</td>
</tr>
<tr>
<td>Community Economic Facilities</td>
<td></td>
<td>33.94</td>
<td>31.54</td>
<td>25.27</td>
<td>4.69</td>
<td>4.52</td>
</tr>
<tr>
<td>Other Assets</td>
<td></td>
<td>61.99</td>
<td>29.17</td>
<td>3.76</td>
<td>0.10</td>
<td>4.95</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>45.31</td>
<td>24.08</td>
<td>16.07</td>
<td>6.54</td>
<td>7.98</td>
</tr>
</tbody>
</table>

a. Damage extent was determined by selecting the highest probability damage state for each facility.
b. Hazus-MH does not produce damage estimates for dams. It is likely that owner/operators have already performed in depth, site-specific seismic hazard analysis.

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

### Table 5-17. Estimated Damage to Critical Facilities from 500-Year Probabilistic Earthquake

<table>
<thead>
<tr>
<th>Category</th>
<th>Damage Extent</th>
<th>None</th>
<th>Slight</th>
<th>Moderate</th>
<th>Extensive</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical and Health Services</td>
<td></td>
<td>41.06</td>
<td>40.72</td>
<td>8.18</td>
<td>0.51</td>
<td>9.51</td>
</tr>
<tr>
<td>Emergency Services</td>
<td></td>
<td>24.57</td>
<td>37.20</td>
<td>25.75</td>
<td>3.20</td>
<td>9.25</td>
</tr>
<tr>
<td>Government</td>
<td></td>
<td>1.04</td>
<td>3.06</td>
<td>15.03</td>
<td>30.51</td>
<td>50.32</td>
</tr>
<tr>
<td>Utilities</td>
<td></td>
<td>1.05</td>
<td>10.64</td>
<td>34.41</td>
<td>34.60</td>
<td>19.27</td>
</tr>
<tr>
<td>Transportation Infrastructure</td>
<td></td>
<td>28.15</td>
<td>14.10</td>
<td>9.23</td>
<td>17.37</td>
<td>31.13</td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td></td>
<td>0.84</td>
<td>2.38</td>
<td>13.30</td>
<td>26.90</td>
<td>56.55</td>
</tr>
<tr>
<td>Community Economic Facilities</td>
<td></td>
<td>1.50</td>
<td>6.42</td>
<td>30.15</td>
<td>30.90</td>
<td>31.01</td>
</tr>
<tr>
<td>Other Assets</td>
<td></td>
<td>27.82</td>
<td>46.89</td>
<td>17.78</td>
<td>1.10</td>
<td>6.39</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>15.75</td>
<td>20.18</td>
<td>19.23</td>
<td>18.14</td>
<td>26.68</td>
</tr>
</tbody>
</table>

a. Damage extent was determined by selecting the highest probability damage state for each facility.
b. Hazus-MH does not produce damage estimates for dams. It is likely that owner/operators have already performed in depth, site-specific seismic hazard analysis.

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

### Table 5-18. Estimated Damage to Critical Facilities from San Gregorio M7.5 Earthquake

<table>
<thead>
<tr>
<th>Category</th>
<th>Damage Extent</th>
<th>None</th>
<th>Slight</th>
<th>Moderate</th>
<th>Extensive</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical and Health Services</td>
<td></td>
<td>79.92</td>
<td>10.95</td>
<td>0.30</td>
<td>0.01</td>
<td>8.80</td>
</tr>
<tr>
<td>Emergency Services</td>
<td></td>
<td>74.46</td>
<td>17.21</td>
<td>1.74</td>
<td>0.04</td>
<td>6.55</td>
</tr>
<tr>
<td>Government</td>
<td></td>
<td>29.01</td>
<td>32.69</td>
<td>26.95</td>
<td>3.91</td>
<td>7.42</td>
</tr>
</tbody>
</table>
TABLE 5-18. ESTIMATED DAMAGE TO CRITICAL FACILITIES FROM SAN GREGORIO M7.5 EARTHQUAKE

<table>
<thead>
<tr>
<th>Category</th>
<th>None</th>
<th>Slight</th>
<th>Moderate</th>
<th>Extensive</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilities</td>
<td>21.35</td>
<td>40.34</td>
<td>28.40</td>
<td>6.35</td>
<td>3.55</td>
</tr>
<tr>
<td>Transportation Infrastructure</td>
<td>67.27</td>
<td>13.67</td>
<td>3.61</td>
<td>4.91</td>
<td>10.52</td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>38.55</td>
<td>22.66</td>
<td>22.39</td>
<td>3.60</td>
<td>12.77</td>
</tr>
<tr>
<td>Community Economic Facilities</td>
<td>29.52</td>
<td>43.30</td>
<td>21.73</td>
<td>1.94</td>
<td>3.50</td>
</tr>
<tr>
<td>Other Assets</td>
<td>78.52</td>
<td>16.55</td>
<td>0.45</td>
<td>0.02</td>
<td>4.44</td>
</tr>
<tr>
<td>Overall</td>
<td>52.33</td>
<td>24.67</td>
<td>13.20</td>
<td>2.60</td>
<td>7.19</td>
</tr>
</tbody>
</table>

c. Damage extent was determined by selecting the highest probability damage state for each facility.
d. Hazus-MH does not produce damage estimates for dams. It is likely that owner/operators have already performed in depth, site-specific seismic hazard analysis.

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

TABLE 5-19. ESTIMATED DAMAGE TO CRITICAL FACILITIES FROM SAN ANDREAS M7.8 EARTHQUAKE

<table>
<thead>
<tr>
<th>Category</th>
<th>None</th>
<th>Slight</th>
<th>Moderate</th>
<th>Extensive</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical and Health Services</td>
<td>64.36</td>
<td>25.99</td>
<td>0.73</td>
<td>0.00</td>
<td>8.90</td>
</tr>
<tr>
<td>Emergency Services</td>
<td>37.18</td>
<td>42.51</td>
<td>12.10</td>
<td>0.20</td>
<td>7.99</td>
</tr>
<tr>
<td>Government</td>
<td>0.66</td>
<td>5.54</td>
<td>33.60</td>
<td>41.45</td>
<td>18.73</td>
</tr>
<tr>
<td>Utilities</td>
<td>7.39</td>
<td>28.95</td>
<td>38.66</td>
<td>16.15</td>
<td>8.82</td>
</tr>
<tr>
<td>Transportation Infrastructure</td>
<td>49.73</td>
<td>16.88</td>
<td>6.85</td>
<td>9.96</td>
<td>16.56</td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>0.81</td>
<td>2.77</td>
<td>20.24</td>
<td>43.11</td>
<td>33.04</td>
</tr>
<tr>
<td>Community Economic Facilities</td>
<td>1.86</td>
<td>15.64</td>
<td>54.62</td>
<td>20.70</td>
<td>7.16</td>
</tr>
<tr>
<td>Other Assets</td>
<td>41.88</td>
<td>47.96</td>
<td>4.15</td>
<td>0.01</td>
<td>5.98</td>
</tr>
<tr>
<td>Overall</td>
<td>25.48</td>
<td>23.28</td>
<td>21.37</td>
<td>16.45</td>
<td>13.40</td>
</tr>
</tbody>
</table>

e. Damage extent was determined by selecting the highest probability damage state for each facility.
f. Hazus-MH does not produce damage estimates for dams. It is likely that owner/operators have already performed in depth, site-specific seismic hazard analysis.

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

**Time to Return to Functionality**

HAZUS-MH estimates the time to restore critical facilities to fully functional use. Results are presented as probability of being functional at specified time increments: 1, 3, 7, 14, 30 and 90 days after the event. For example, HAZUS-MH may estimate that a facility has 5 percent chance of being fully functional at Day 3, and a 95-percent chance of being fully functional at Day 90. Results from the 100- and 500-year probabilistic and the San Gregorio and San Andreas scenario events are summarized in Table 5-20 through Table 5-23.
### TABLE 5-20. FUNCTIONALITY OF CRITICAL FACILITIES FOR 100-YEAR EARTHQUAKE

<table>
<thead>
<tr>
<th>Category</th>
<th># of Critical Facilities</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;a&lt;/sup&gt;</th>
<th>at Day 1</th>
<th>at Day 3</th>
<th>at Day 7</th>
<th>at Day 14</th>
<th>at Day 30</th>
<th>at Day 90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical and Health Services</td>
<td>10</td>
<td>74.5</td>
<td>74.9</td>
<td>90.0</td>
<td>90.4</td>
<td>91.6</td>
<td>91.6</td>
<td></td>
</tr>
<tr>
<td>Emergency Services</td>
<td>81</td>
<td>59.7</td>
<td>60.3</td>
<td>85.1</td>
<td>85.7</td>
<td>92.6</td>
<td>92.8</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>50</td>
<td>25.4</td>
<td>26.4</td>
<td>47.3</td>
<td>47.4</td>
<td>77.0</td>
<td>90.1</td>
<td></td>
</tr>
<tr>
<td>Utilities</td>
<td>188</td>
<td>50.5</td>
<td>75.4</td>
<td>89.2</td>
<td>93.2</td>
<td>96.7</td>
<td>99.4</td>
<td></td>
</tr>
<tr>
<td>Transportation Infrastructure</td>
<td>412</td>
<td>80.4</td>
<td>84.2</td>
<td>85.4</td>
<td>85.6</td>
<td>86.1</td>
<td>89.4</td>
<td></td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>71</td>
<td>21.4</td>
<td>22.1</td>
<td>36.1</td>
<td>36.1</td>
<td>62.8</td>
<td>83.4</td>
<td></td>
</tr>
<tr>
<td>Community Economic Facilities</td>
<td>103</td>
<td>33.9</td>
<td>35.4</td>
<td>65.3</td>
<td>65.4</td>
<td>90.7</td>
<td>95.4</td>
<td></td>
</tr>
<tr>
<td>Other Assets</td>
<td>269</td>
<td>61.9</td>
<td>62.6</td>
<td>90.4</td>
<td>91.1</td>
<td>94.9</td>
<td>94.9</td>
<td></td>
</tr>
<tr>
<td><strong>Total/Average</strong></td>
<td><strong>1,184</strong></td>
<td><strong>51.0</strong></td>
<td><strong>55.2</strong></td>
<td><strong>73.6</strong></td>
<td><strong>74.4</strong></td>
<td><strong>86.6</strong></td>
<td><strong>92.1</strong></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Hazus-MH does not produce functionality estimates for dams. It is likely that owner/operators have already performed in depth, site-specific seismic hazard analysis.

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

### TABLE 5-21. FUNCTIONALITY OF CRITICAL FACILITIES FOR PROBABILISTIC 500-YEAR EARTHQUAKE

<table>
<thead>
<tr>
<th>Category</th>
<th># of Critical Facilities</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;a&lt;/sup&gt;</th>
<th>at Day 1</th>
<th>at Day 3</th>
<th>at Day 7</th>
<th>at Day 14</th>
<th>at Day 30</th>
<th>at Day 90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical and Health Services</td>
<td>10</td>
<td>41.0</td>
<td>42.0</td>
<td>80.8</td>
<td>81.7</td>
<td>89.9</td>
<td>90.2</td>
<td></td>
</tr>
<tr>
<td>Emergency Services</td>
<td>81</td>
<td>24.5</td>
<td>25.4</td>
<td>60.9</td>
<td>61.8</td>
<td>87.5</td>
<td>89.1</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>50</td>
<td>1.0</td>
<td>1.1</td>
<td>4.0</td>
<td>4.1</td>
<td>19.1</td>
<td>49.2</td>
<td></td>
</tr>
<tr>
<td>Utilities</td>
<td>188</td>
<td>20.4</td>
<td>36.1</td>
<td>54.2</td>
<td>65.2</td>
<td>80.8</td>
<td>95.3</td>
<td></td>
</tr>
<tr>
<td>Transportation Infrastructure</td>
<td>412</td>
<td>44.2</td>
<td>50.2</td>
<td>53.4</td>
<td>54.2</td>
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<td>66.5</td>
<td></td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>71</td>
<td>0.8</td>
<td>0.9</td>
<td>3.2</td>
<td>3.2</td>
<td>16.5</td>
<td>43.4</td>
<td></td>
</tr>
<tr>
<td>Community Economic Facilities</td>
<td>103</td>
<td>1.5</td>
<td>1.8</td>
<td>7.9</td>
<td>7.9</td>
<td>38.0</td>
<td>68.9</td>
<td></td>
</tr>
<tr>
<td>Other Assets</td>
<td>269</td>
<td>27.8</td>
<td>28.8</td>
<td>73.6</td>
<td>74.7</td>
<td>92.4</td>
<td>93.0</td>
<td></td>
</tr>
<tr>
<td><strong>Total/Average</strong></td>
<td><strong>1,184</strong></td>
<td><strong>20.2</strong></td>
<td><strong>23.3</strong></td>
<td><strong>42.3</strong></td>
<td><strong>44.1</strong></td>
<td><strong>60.0</strong></td>
<td><strong>74.5</strong></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Hazus-MH does not produce functionality estimates for dams. It is likely that owner/operators have already performed in depth, site-specific seismic hazard analysis.

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.
### Table 5-22. Functionality of Critical Facilities for San Gregorio M7.5 Earthquake

<table>
<thead>
<tr>
<th></th>
<th>Number of Critical Facilities</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;2&lt;/sup&gt; at Day 1</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;2&lt;/sup&gt; at Day 3</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;2&lt;/sup&gt; at Day 7</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;2&lt;/sup&gt; at Day 14</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;2&lt;/sup&gt; at Day 30</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;2&lt;/sup&gt; at Day 90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical and Health Services</td>
<td>10</td>
<td>79.9</td>
<td>80.1</td>
<td>90.6</td>
<td>90.8</td>
<td>91.1</td>
<td>91.1</td>
</tr>
<tr>
<td>Emergency Services</td>
<td>81</td>
<td>74.4</td>
<td>74.8</td>
<td>91.2</td>
<td>91.6</td>
<td>93.3</td>
<td>93.3</td>
</tr>
<tr>
<td>Government</td>
<td>50</td>
<td>29.0</td>
<td>30.5</td>
<td>61.5</td>
<td>61.7</td>
<td>88.6</td>
<td>92.2</td>
</tr>
<tr>
<td>Utilities</td>
<td>188</td>
<td>53.5</td>
<td>77.6</td>
<td>90.0</td>
<td>93.5</td>
<td>96.5</td>
<td>99.4</td>
</tr>
<tr>
<td>Transportation Infrastructure</td>
<td>412</td>
<td>80.3</td>
<td>84.1</td>
<td>85.3</td>
<td>85.6</td>
<td>86.0</td>
<td>89.0</td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>71</td>
<td>38.5</td>
<td>39.6</td>
<td>61.1</td>
<td>61.2</td>
<td>83.5</td>
<td>87.2</td>
</tr>
<tr>
<td>Community Economic Facilities</td>
<td>103</td>
<td>29.5</td>
<td>31.5</td>
<td>72.6</td>
<td>72.8</td>
<td>94.5</td>
<td>96.4</td>
</tr>
<tr>
<td>Other Assets</td>
<td>269</td>
<td>78.5</td>
<td>78.8</td>
<td>94.6</td>
<td>95.0</td>
<td>95.5</td>
<td>95.5</td>
</tr>
<tr>
<td><strong>Total/Average</strong></td>
<td><strong>1,184</strong></td>
<td><strong>58.0</strong></td>
<td><strong>62.1</strong></td>
<td><strong>80.9</strong></td>
<td><strong>81.5</strong></td>
<td><strong>91.1</strong></td>
<td><strong>93.0</strong></td>
</tr>
</tbody>
</table>

b. Hazus-MH does not produce functionality estimates for dams. It is likely that owner/operators have already performed in-depth, site-specific seismic hazard analysis.

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

### Table 5-23. Functionality of Critical Facilities for N San Andreas M7.8 Earthquake

<table>
<thead>
<tr>
<th></th>
<th>Number of Critical Facilities</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;2&lt;/sup&gt; at Day 1</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;2&lt;/sup&gt; at Day 3</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;2&lt;/sup&gt; at Day 7</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;2&lt;/sup&gt; at Day 14</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;2&lt;/sup&gt; at Day 30</th>
<th>Probability of Being Fully Functional (%)&lt;sup&gt;2&lt;/sup&gt; at Day 90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical and Health Services</td>
<td>10</td>
<td>64.3</td>
<td>64.9</td>
<td>89.7</td>
<td>90.3</td>
<td>91.0</td>
<td>91.0</td>
</tr>
<tr>
<td>Emergency Services</td>
<td>81</td>
<td>37.1</td>
<td>38.1</td>
<td>78.7</td>
<td>79.7</td>
<td>91.7</td>
<td>91.8</td>
</tr>
<tr>
<td>Government</td>
<td>50</td>
<td>0.6</td>
<td>0.9</td>
<td>6.1</td>
<td>6.1</td>
<td>39.8</td>
<td>80.9</td>
</tr>
<tr>
<td>Utilities</td>
<td>188</td>
<td>36.6</td>
<td>59.7</td>
<td>77.1</td>
<td>83.6</td>
<td>90.9</td>
<td>97.9</td>
</tr>
<tr>
<td>Transportation Infrastructure</td>
<td>412</td>
<td>66.5</td>
<td>72.3</td>
<td>74.6</td>
<td>75.1</td>
<td>76.0</td>
<td>82.0</td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>71</td>
<td>0.8</td>
<td>0.9</td>
<td>3.5</td>
<td>3.5</td>
<td>23.8</td>
<td>66.9</td>
</tr>
<tr>
<td>Community Economic Facilities</td>
<td>103</td>
<td>1.8</td>
<td>2.6</td>
<td>17.4</td>
<td>17.5</td>
<td>72.1</td>
<td>92.8</td>
</tr>
<tr>
<td>Other Assets</td>
<td>269</td>
<td>41.8</td>
<td>42.9</td>
<td>88.7</td>
<td>89.8</td>
<td>93.9</td>
<td>93.9</td>
</tr>
<tr>
<td><strong>Total/Average</strong></td>
<td><strong>1,184</strong></td>
<td><strong>31.2</strong></td>
<td><strong>35.3</strong></td>
<td><strong>54.5</strong></td>
<td><strong>55.7</strong></td>
<td><strong>72.4</strong></td>
<td><strong>87.2</strong></td>
</tr>
</tbody>
</table>

c. Hazus-MH does not produce functionality estimates for dams. It is likely that owner/operators have already performed in-depth, site-specific seismic hazard analysis.

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

**Hazardous Materials**

Hazardous material releases from fixed facilities and transportation-related releases can occur during an earthquake.
Transportation

Roads have the potential to be significantly damaged during an earthquake. Access to major roads is crucial to life and safety after a disaster event as well as to response and recovery operations. Disruption in transportation systems are of particular concern to coastal residents, as a major event has the potential to isolate communities from critical assistance and aid. Additionally, Bay Area Rapid Transit (BART) provides transportation service to the northern portion of San Mateo County from South San Francisco to Millbrae and the San Francisco Airport. Much of BART transportation infrastructure located in San Mateo County is underground. BART tunnels may collapse during a high magnitude event, leading to loss of life and potential hazardous materials release.

Bridges

Earthquake events can significantly damage bridges, which often provide the only access to some neighborhoods. Since soft soil regions generally follow floodplain boundaries, bridges that cross water courses are considered vulnerable. Since many of the County's bridges provide access across water courses, most are at least somewhat vulnerable to earthquakes. Key factors in the degree of vulnerability are the facility's age and type of construction, which indicate the standards to which the facility was built.

Water and Sewer Infrastructure

Water and sewer infrastructure would likely suffer considerable damage in the event of an earthquake. This factor is difficult to analyze based on the amount of infrastructure and because water and sewer infrastructure are usually linear easements, which are difficult to thoroughly assess in HAZUS. Without further analysis of individual system components, it should be assumed that these systems are exposed to breakage and failure.

5.5.4 Environment

The environment vulnerable to earthquake hazard is the same as the environment exposed to the hazard.

5.5.5 Economic Impact

Earthquake events can severely disrupt the economy of the affected area. Economic impact will be largely associated with the disruption of services caused by an earthquake event. In general, significant events may cause damage to land, buildings, transportation infrastructure, and businesses. With an event of such significance, economic recovery could take years, depending on available recovery funds.

5.6 Future Trends in Development

The County of San Mateo is expected to grow considerably in the next 10 years, with an estimated population of 832,000 by 2025. Significant non-residential development will occur as well, with increasing establishment of technology companies throughout the County likely in the near future.

San Mateo County considers land use development and environmental and hazard protection needs in its Shared Vision 2025. The County seeks to ensure a “prosperous community” through encouraging innovation in the local economy, creating jobs, and building community and educational opportunities; improving
affordability; and closing achievement gaps. It also seeks a “livable community,” with growth occurring near transit to promote affordable and interconnected communities. Under its “environmentally conscious community” category, San Mateo seeks to preserve natural resources through stewardship; reduce carbon emissions; and use energy, water, and land more efficiently. Performance measures and benchmarks are updated annually on the Shared Vision 2025 website (https://performance.smcgov.org/shared-vision), allowing residents to consistently assess the success and outcomes of local initiatives.

Unincorporated San Mateo County and the development departments in participating jurisdictions will strictly enforce all seismic building codes and design standards to prevent loss of life and property caused by earthquake. Public education, cooperation with the development community, and individual preparedness are essential as the planning area welcomes thousands of new residents and hundreds of new businesses to each year.

Additionally, land use planning is also directed by general plans adopted under California’s General Planning Law. Municipal planning partners are encouraged to establish General Plans with policies directing land use and dealing with issues of geologic and seismic safety. These plans provide the capability at the local municipal level to protect future development from the impacts of earthquakes. All planning partners reviewed their general plans under the capability assessments performed for this effort. Deficiencies identified by these reviews can be identified as mitigation actions to increase the capability to deal with future trends in development.

Since all of San Mateo is located within an earthquake hazard zone, all future development will, to some extent, be exposed to the earthquake hazard. Tables 5-24 through 5-26 provides future development acres and percentages as related specifically to moderate, high, and very high liquefaction susceptibility.
9.c

San Mateo County Hazard Mitigation Plan

Jurisdiction
ATHERTON

Agriculture/Resource
Extraction
Commercial
Education
Industrial
Mixed Use
Area
Area
Area
Area
Area
(acres)
% of Total
(acres) % of Total (acres) % of Total (acres) % of Total (acres) % of Total
0.0
0.00%
0.6
0.02%
203.0
8.16%
0.0
0.00%
0.0
0.00%

Other/Unknown
Parks/Open Space
Area
Area
(acres) % of Total (acres) % of Total
37.7
1.51%
54.8
2.20%

Residential
Area
(acres)
% of Total
2,192.2 88.10%

Area
(acres) % of Total
0.0
0.00%

Total
Area
(acres)
2,488.3

BELMONT

0.0

0.00%

57.9

15.37%

57.0

15.12%

5.6

1.47%

10.6

2.82%

37.0

9.82%

26.5

7.04%

182.3

48.37%

0.0

0.00%

376.8

BRISBANE

0.0

0.00%

40.4

79.95%

0.0

0.00%

0.0

0.00%

0.0

0.00%

9.1

17.91%

0.9

1.70%

0.2

0.44%

0.0

0.00%

50.6

BURLINGAME

0.0

0.00%

87.7

13.42%

22.4

3.42%

0.0

0.00%

24.4

3.73%

218.1

33.37%

5.1

0.77%

296.1

45.29%

0.0

0.00%

653.7

COLMA

0.0

0.00%

11.6

71.93%

0.0

0.00%

0.0

0.00%

0.0

0.00%

4.5

28.04%

0.0

0.00%

0.0

0.03%

0.0

0.00%

16.2

DALY CITY

0.0

0.00%

3.9

12.83%

0.0

0.00%

0.0

0.00%

0.0

0.00%

5.5

17.91%

8.8

28.73%

12.4

40.53%

0.0

0.00%

30.7

EAST PALO ALTO

0.2

0.02%

32.0

4.54%

0.0

0.00%

15.8

2.24%

0.0

0.00%

124.2

17.59%

142.2

20.15%

391.4

55.46%

0.0

0.00%

705.8

FOSTER CITY

0.0

0.00%

155.5

53.74%

7.0

2.42%

0.3

0.12%

0.5

0.17%

7.5

2.61%

42.5

14.68%

75.0

25.91%

1.0

0.36%

289.4

HALF MOON BAY

101.7

6.69%

103.2

6.79%

54.2

3.57%

9.7

0.64%

0.0

0.00%

555.7

36.58%

219.0

14.42%

475.5

31.30%

0.0

0.00%

1,518.9

HILLSBOROUGH

0.0

0.00%

0.0

0.00%

6.6

6.00%

0.0

0.00%

0.0

0.00%

21.0

18.99%

0.1

0.12%

82.7

74.89%

0.0

0.00%

110.4

MENLO PARK

1,747.2

35.14%

343.4

6.91%

206.0

4.14%

517.6

10.41%

0.0

0.00%

205.1

4.13%

399.8

8.04%

1,552.5

31.23%

0.0

0.00%

4,971.6

MILLBRAE

0.0

0.00%

23.1

10.34%

18.3

8.19%

0.0

0.00%

0.1

0.07%

36.2

16.24%

29.8

13.34%

115.7

51.83%

0.0

0.00%

223.2

PACIFICA

9.4

0.69%

86.0

6.34%

109.9

8.11%

0.0

0.00%

0.0

0.00%

207.8

15.32%

134.7

9.93%

808.2

59.60%

0.1

0.01%

1,356.1

PORTOLA VALLEY

0.0

0.00%

5.9

1.43%

70.1

16.94%

0.0

0.00%

0.0

0.00%

12.8

3.08%

135.0

32.60%

190.2

45.95%

0.0

0.00%

414.0

REDWOOD CITY

0.0

0.00%

235.9

2.71%

122.5

1.41%

313.6

3.61%

126.8

1.46%

2,943.6

33.87%

3,338.9

38.42%

1,608.6

18.51%

0.0

0.00%

8,689.9

SAN BRUNO

0.0

0.00%

5.4

6.41%

1.9

2.25%

13.3

15.88%

0.0

0.00%

5.2

6.24%

21.4

25.56%

36.5

43.66%

0.0

0.00%

83.6

SAN CARLOS

0.0

0.00%

177.5

16.75%

0.0

0.00%

157.9

14.91%

0.0

0.00%

13.4

1.26%

60.7

5.73%

649.8

61.35%

0.0

0.00%

1,059.3

SAN MATEO

0.0

0.00%

251.6

17.18%

105.3

7.19%

7.3

0.50%

97.2

6.64%

127.5

8.71%

81.1

5.54%

794.2

54.24%

0.0

0.00%

1,464.3

SOUTH SAN FRANCISCO

0.0

0.00%

17.1

11.93%

0.9

0.66%

0.8

0.54%

4.5

3.13%

56.5

39.29%

2.5

1.71%

61.4

42.74%

0.0

0.00%

143.7

WOODSIDE

0.0

0.00%

0.3

0.04%

0.0

0.00%

0.0

0.00%

0.3

0.04%

5.9

0.74%

663.9

83.05%

129.0

16.14%

0.0

0.00%

799.4

UNINCORPORATED

3,383.6

40.92%

108.9

1.32%

33.9

0.41%

173.3

2.10%

309.4

3.74%

479.7

5.80%

2,573.8

31.13%

1,205.8

14.58%

0.0

0.00%

8,268.4

Total

5,242.1

15.55%

1,747.9

5.18%

1,019.1

3.02%

1,215.1

3.60%

573.9

1.70%

5,114.0

15.17%

7,941.4

23.55%

10,859.8 32.21%

1.2

0.00%

33,714.4

Water

Attachment: San Mateo HMP - Volume I - Final Revised (2013 : Resolution Adopting the SMC Hazard Mitigation Plan Update)

TABLE 5-24. FUTURE DEVELOPMENT ACRES AND PERCENTAGES RELATED TO MODERATE

99
SECTION 2 - Chapter 5
Earthquake

Packet Pg. 397


### Table 5-25. Future Development Acres and Percentages Related to High

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<th>Agriculture/Resource Extraction</th>
<th>Commercial</th>
<th>Education</th>
<th>Industrial</th>
<th>Mixed Use</th>
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<th>Parks/Open Space</th>
<th>Residential</th>
<th>Water</th>
<th>Total</th>
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<tr>
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<tr>
<td>Colma</td>
<td>0.0 0.00% 32.5 45.70% 1.3 1.80% 0.0 0.00% 0.1 0.10% 37.2 52.28% 0.0 0.00% 0.1 0.12% 0.0 0.00% 71.1</td>
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</tr>
<tr>
<td>Daly City</td>
<td>0.0 0.00% 4.2 15.38% 7.7 28.51% 0.0 0.00% 0.0 0.00% 1.5 5.37% 5.5 20.32% 8.2 30.42% 0.0 0.00% 27.0</td>
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<tr>
<td>South San Francisco</td>
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<td>Woodside</td>
<td>0.0 0.00% 0.0 0.00% 0.0 0.00% 0.0 0.00% 2.7 6.29% 4.9 11.30% 35.5 82.02% 0.2 0.38% 0.0 0.00% 43.3</td>
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<td>Unincorporated</td>
<td>2,467.6 73.81% 13.5 0.40% 32.1 0.96% 0.2 0.01% 68.8 2.06% 35.4 1.06% 616.9 18.45% 108.8 3.26% 0.0 0.00% 3,343.3</td>
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<td>Total</td>
<td>2,467.6 64.50% 97.8 2.56% 55.3 1.44% 9.5 0.25% 98.0 2.56% 176.7 4.82% 696.0 18.19% 224.6 5.87% 0.0 0.00% 3,825.5</td>
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<td></td>
<td>Water</td>
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</tr>
</tbody>
</table>

**Table 5-26: Future Development Acres and Percentages Related to Very High**

- **Atheron**: 0.0 0.00% 0.0 0.00% 2.6 3.94% 0.0 0.00% 0.7 1.09% 19.9 30.47% 42.0 64.50% 0.0 0.00% 65.2
- **Belmont**: 0.0 0.00% 7.0 3.50% 3.5 1.74% 27.6 13.83% 62.5 31.35% 55.8 27.97% 7.9 3.94% 33.2 16.63% 2.1 1.03% 199.3
- **Brisbane**: 0.1 0.01% 645.8 64.70% 0.0 0.00% 0.0 0.00% 0.0 0.00% 210.4 21.08% 141.7 14.19% 0.2 0.02% 0.0 0.00% 998.1
- **Burlingame**: 0.0 0.00% 196.0 26.48% 0.0 0.00% 0.0 0.00% 0.0 0.00% 259.3 35.03% 159.1 21.49% 118.2 15.97% 7.6 1.03% 0.0 0.00% 740.2
- **Colma**: 0.0 0.00% 0.1 3.31% 0.0 0.00% 0.0 0.00% 0.0 0.00% 2.9 96.69% 0.0 0.00% 0.0 0.00% 0.0 0.00% 3.0
- **Daly City**: 0.0 0.00% 0.3 0.95% 0.0 0.00% 0.1 0.36% 0.0 0.00% 1.1 3.63% 29.4 95.06% 0.0 0.00% 0.0 0.00% 30.9
- **East Palo Alto**: 0.5 0.06% 91.3 10.06% 0.2 0.02% 119.0 13.11% 0.0 0.00% 193.6 21.32% 115.6 12.74% 387.5 42.69% 0.0 0.00% 907.7
- **Foster City**: 0.0 0.00% 298.2 12.75% 80.6 3.45% 54.5 2.33% 12.6 0.54% 16.7 0.71% 166.0 7.10% 1,478.0 63.22% 231.3 9.89% 2,337.8
- **Half Moon Bay**: 11.6 5.57% 9.6 4.59% 3.6 1.71% 1.2 0.59% 0.0 0.00% 69.9 33.57% 106.6 51.19% 5.8 2.79% 0.0 0.00% 208.2
- **Hillsborough**: 0.0 0.00% 0.0 0.00% 0.3 0.70% 0.0 0.00% 0.0 0.00% 9.1 21.77% 7.6 18.12% 24.8 59.41% 0.0 0.00% 41.7
- **Menlo Park**: 80.5 10.47% 49.9 6.48% 49.7 6.46% 113.7 14.77% 0.0 0.00% 144.2 18.74% 71.5 9.29% 260.0 33.78% 0.0 0.00% 769.5
- **Millbrae**: 0.0 0.00% 15.4 9.90% 0.0 0.00% 19.9 12.80% 0.5 0.30% 86.9 55.96% 11.7 7.54% 21.0 13.50% 0.0 0.00% 155.3
- **Pacifica**: 1.2 0.56% 4.8 2.26% 2.3 1.08% 0.0 0.00% 0.0 0.00% 56.5 26.73% 107.5 50.83% 24.5 11.57% 14.7 6.97% 211.5
- **Portola Valley**: 0.0 0.00% 0.0 0.00% 0.3 0.54% 0.0 0.00% 0.0 0.00% 5.9 10.01% 17.1 28.86% 33.1 55.71% 0.0 0.00% 59.4
- **Redwood City**: 0.0 0.00% 439.2 15.64% 31.9 1.14% 309.6 11.02% 14.7 0.52% 1,120.7 39.90% 398.5 14.19% 494.4 17.60% 0.0 0.00% 2,809.0
- **San Bruno**: 0.0 0.00% 0.6 2.10% 0.0 0.00% 11.2 38.53% 0.0 0.00% 1.7 5.75% 0.0 0.00% 15.6 53.61% 0.0 0.00% 29.2
- **San Carlos**: 0.0 0.00% 36.2 8.90% 9.4 2.31% 156.8 38.59% 0.0 0.00% 183.0 45.03% 10.7 2.64% 10.3 2.53% 0.0 0.00% 406.3
- **San Mateo**: 0.0 0.00% 311.9 11.04% 126.0 4.46% 32.0 0.11% 82.6 2.92% 338.5 11.98% 489.2 17.31% 1,474.2 52.17% 0.0 0.00% 2,825.7
- **South San Francisco**: 0.0 0.00% 476.1 34.66% 0.0 0.00% 465.7 33.90% 21.4 1.56% 355.7 25.89% 49.9 3.63% 5.1 0.37% 0.0 0.00% 1,373.9
- **Woods**: 0.0 0.00% 1.6 1.37% 0.0 0.00% 0.0 0.00% 0.0 0.00% 5.7 4.88% 54.7 47.07% 54.2 46.68% 0.0 0.00% 116.1
- **Unincorporated**: 669.3 12.54% 7.2 0.13% 3.9 0.07% 17.0 0.32% 102.8 1.93% 2,341.0 43.86% 2,146.4 40.21% 50.9 0.94% 0.0 0.00% 5,337.5
- **Total**: 763.2 3.89% 2,591.0 13.20% 317.1 1.62% 1,299.5 6.62% 556.3 2.83% 5,359.0 27.31% 4,070.0 20.74% 4,421.4 22.53% 248.1 1.26% 19,625.6
5.7 Scenario

Any seismic activity of 6.0 or greater on faults within the planning area would have significant impacts throughout the County. Potential warning systems could give approximately 40 seconds notice that a major earthquake is about to occur. This warning would not provide adequate time for preparation. Earthquakes of this magnitude or higher would lead to massive structural failure of property on NEHRP C, D, E, and F soils. Levees and revetments built on these poor soils would likely fail, representing a loss of critical infrastructure. These events could cause secondary hazards, including landslides and mudslides that would further damage structures. Hydraulic-fill sediment areas are also vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. Soil liquefaction would occur in water-saturated sands, silts, or gravelly soils.

5.8 Issues

Important issues associated with an earthquake include but are not limited to the following:

- More information is needed on the exposure and performance of soft-story construction within the planning area.
- Based on the modeling of critical facility performance performed for this plan, a high number of facilities in the planning area are expected to suffer complete or extensive damage from scenario events. These facilities are prime targets for structural retrofits.
- Critical facility owner should be encouraged to create or enhance Continuity of Operations Plans using the information on risk and vulnerability contained in this plan.
- Geotechnical standards should be established that take into account the probable impacts from earthquakes in the design and construction of new or enhanced facilities.
- There are a large number of earthen dams within the planning area. Dam failure warning and evacuation plans and procedures should be reviewed and updated to reflect the dams’ risk potential associated with earthquake activity in the region. The County levees should also be included in any assessments for earthquake risk.
- Earthquakes could trigger other natural hazard events such as dam failures, flooding, fire, and landslides, which could severely damage the County.
- A worst-case scenario would be the occurrence of a large seismic event during a flood or high-water event. Levees would fail at multiple locations, increasing the impacts of the individual events.
- Citizens are expected to be self-sufficient up to 3 days after a major earthquake without government response agencies, utilities, private-sector services, and infrastructure components. Education programs are currently in place to facilitate development of individual, family, neighborhood, and business earthquake preparedness. Government alone can never make this region fully prepared. It takes individuals, families, and communities working in concert with one another to truly be prepared for disaster.
- After a major seismic event, San Mateo County is likely to experience disruptions in the flow of goods and services resulting from the destruction of major transportation infrastructure across the broader region.
Chapter 6. Flood

6.1 Hazard Description

Floods are one of the most common natural hazards in the United States. They can develop slowly over a period of days or develop quickly, with disastrous effects that can be local (impacting a neighborhood or community) or regional (affecting entire river basins, coastlines, and multiple counties or states).

6.1.1 General Background

A floodplain is defined as the land adjoining a channel of a river, stream, ocean, lake, or other watercourse or water body that becomes inundated with water during a flood. Floodplains may be broad, as when a river crosses an extensive flat landscape, or narrow, as when a river is confined in a canyon.

When floodwaters recede after a flood event, they leave behind layers of rock and mud. These gradually build up to create a new floor of the floodplain. Floodplains generally contain unconsolidated sediments (accumulations of sand, gravel, loam, silt, and/or clay), often extending below the bed of the stream. These sediments provide a natural filtering system, with water percolating back into the ground and replenishing groundwater. These are often important aquifers, as water drawn from them has been filtered, unlike water in the stream. Fertile, flat, reclaimed floodplain lands are commonly used for agriculture, commerce, and residential development.

Connections between a water source and its floodplain are most apparent during and after major flood events. These areas form a complex physical and biological system that not only supports a variety of natural resources but also provides natural flood and erosion control. When a river is separated from its floodplain by levees and other flood control facilities, natural, built-in benefits can be lost, altered, or significantly reduced.

DEFINITIONS

- **Flood** — Inundation of normally dry land resulting from rising and overflowing of a body of water.
- **Floodplain** — Land area along the sides of a river that becomes inundated with water during a flood.
- **Regulatory Floodway** — Channel of a river or other watercourse and adjacent land areas that must be reserved for discharge of the base flood without cumulatively increasing water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure no increases in upstream flood elevations.
- **1-Percent Annual Chance Flood** — Also known as the Special Flood Hazard Area (SFHA) or 100-year floodplain. The area inundated by a flood that has a 1-percent chance of being equaled or exceeded each year.
- **0.2-Percent Annual Chance Flood** — Also known as the 500-year floodplain. The area inundated by floodwaters that has a 0.2-percent chance of being equaled or exceeded each year.
- **Return Period** — Average number of years between occurrences of a hazard (equal to the inverse of the annual likelihood of occurrence).
6.1.2 Measuring Floods and Floodplains

Frequency and severity of flooding are measured by use of a discharge probability—probability that a certain river discharge (flow) level will be equaled or exceeded in a given year. Flood studies reference historical records to determine probabilities of occurrence of different discharge levels. Flood frequency equals 100 divided by the discharge probability. For example, the 100-year discharge has a 1-percent chance of being equaled or exceeded in any given year. The “annual flood” is the greatest flood event expected to occur in a typical year. Measurements reflect statistical averages only; two or more floods with 100-year or higher recurrence intervals can occur within a short time period. Recurrence intervals can differ at different points on a river; for example, an event may be a 100-year flood on the main river but a 50-year flood on the river’s tributaries or farther downstream.

Extent of flooding associated with a 1-percent annual probability of occurrence (the base flood or 100-year flood) is used as the regulatory boundary by many federal, state, and local agencies. Also referred to as the special flood hazard area (SFHA), this boundary is a convenient tool for assessing vulnerability and risk in flood-prone communities. Many communities have maps that show the extent and likely depth of flooding for the base flood. Corresponding water-surface elevations describe the elevation of water that will result from a given discharge level, one of the most important factors in estimating flood damage.

6.1.3 Floodplain Ecosystems

Floodplains can support ecosystems rich in plant and animal species. A floodplain can contain 100 or even 1,000 times as many species as a river. Wetting of the floodplain soil releases an immediate surge of nutrients: those left over from the last flood, and those that result from rapid decomposition of organic matter that has accumulated since then. Microscopic organisms thrive and larger species enter a rapid breeding cycle. Opportunistic feeders (particularly birds) move in to take advantage. Production of nutrients peaks and falls away quickly, but the surge of new growth endures for some time. This renders floodplains valuable for agriculture. Species growing in floodplains differ markedly from those that grow outside floodplains. For instance, riparian trees (trees that grow in floodplains) tend to be very tolerant of root disturbance and very quick-growing compared to non-riparian trees.

6.1.4 Effects of Human Activities

Because they border water bodies, floodplains have historically been popular sites to establish settlements. Human activities tend to concentrate in floodplains for a number of reasons: water is readily available, land is fertile and suitable for farming, transportation by water is easily accessible, and land is flatter and easier to develop. Yet human activity in floodplains frequently interferes with natural functions of floodplains. It can affect distribution and timing of drainage, thereby increasing flood problems. Human development can create local flooding problems by altering or confining drainage channels, increasing flood potential in two ways: reducing the stream’s capacity to contain flows, and increasing flow rates or velocities downstream during all stages of a flood event. As a result, Flood Insurance Rate Maps (FIRM) delineate regulatory floodways where development is minimized or prohibited. Development projects within floodways are highly regulated and proceed case by case.
6.1.5 Federal Flood Programs

National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. For most participating communities, the Federal Emergency Management Agency (FEMA) has prepared a detailed Flood Insurance Study (FIS). The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood. Base flood elevations and boundaries of the 1-percent and 0.2-percent annual chance floodplains are shown on FIRMs, the principle tool for identifying extent and location of a flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. In recent years, FIRMs have been digitized and renamed Digital Flood Insurance Rate Maps (DFIRM). This change renders the documents more accessible to residents, local governance, and stakeholders.

Minimally, participants in the NFIP must regulate development within floodplain areas in accordance with NFIP criteria. Before issuing a permit to build in a floodplain, participating jurisdictions must ensure that three criteria are met:

- Minimally, new buildings and those undergoing substantial improvements must be elevated to protect against damage by the base flood.
- New floodplain development must not aggravate existing flood problems or increase damage to other properties.
- New floodplain development must exercise a reasonable and prudent effort to reduce its adverse impacts on listed threatened/endangered aquatic species.

In participating communities, structures that had been permitted or built in the planning area before implementation of NFIP and related building code regulations are called “pre-FIRM” structures, and structures built afterwards are called “post-FIRM” structures. Insurance rates differ for these two types of structures. Communities participating in the NFIP may adopt regulations more stringent than those specified in 44 Code of Federal Regulations (CFR) 60.3, but not less stringent.

The most recent DFIRMs in the County are from July 5, 2015, and include revisions made as part of the 2015 FIS for the County. Both the DFIRMs and the FIS are updates from the October 2012 versions. FEMA has also developed preliminary DFIRMs that will be dated 2016. Although the preliminary data are the most recent available, until officially approved and adopted, these data can be used only for review and guidance purposes. Preliminary data are subject to change until official approval, and thus cannot be used to rate flood insurance policies or enforce the federal mandatory purchase requirement.

In the State of California, the Department of Water Resources (DWR) is the coordinating agency for floodplain management. DWR works with FEMA and local governments by providing grants and technical assistance, evaluating community floodplain management programs, reviewing local floodplain ordinances, participating in statewide flood hazard mitigation planning, and facilitating annual statewide workshops. Compliance is
monitored by FEMA regional staff and by DWR. Again, maintaining compliance under the NFIP is an important component of flood risk reduction.

**FEMA Regulatory Flood Zones**

According to FEMA, flood hazard areas are defined as areas shown on a map to be inundated by a flood of a given magnitude. These areas are determined via statistical analyses of records of river flow, storm tides, and rainfall; information obtained through consultation with the community; floodplain topographic surveys; and hydrologic and hydraulic analyses. Flood hazard areas are delineated on DFIRMs, which are official maps of a community on which the Federal Insurance and Mitigation Administration has delineated both SFHAs and risk premium zones applicable to the community. In addition to this, DFIRMS identify locations of specific properties in relation to SFHAs; base flood elevations (1-percent annual chance) at specific sites; magnitudes of flood within specific areas; undeveloped coastal barriers where flood insurance is not available; and regulatory floodways and floodplain boundaries (1-percent and 0.2-percent annual chance floodplain boundaries).

Land area covered by floodwaters of the base flood is the SFHA on a DFIRM—an area where NFIP floodplain management regulations must be enforced, and where mandatory purchase of flood insurance applies. This regulatory boundary is a convenient tool for assessing vulnerability and risk in flood-prone communities, because many communities have maps showing the extent of the base flood and likely depths that will occur.

The 1-percent annual chance flood is also referred to as the base flood elevation. As noted earlier, the NFIP defines the base flood elevation as the elevation of a base flood event or a flood which has a 1-percent chance of occurring in any given year. The base flood elevation is the exact elevation of water that will result from a given discharge level, one of the most important factors in estimating potential damage within a given area. A structure within a 1-percent annual chance floodplain has a 26-percent chance of undergoing flood damage during the term of a 30-year mortgage. The 1-percent annual chance flood is a regulatory standard adopted by federal agencies and most states to administer floodplain management programs. The 1-percent annual chance flood is used by the NFIP as the basis for insurance requirements nationwide. DFIRMs also depict 0.2-percent annual chance flood designations (500-year events).

DFIRM, FIRMs, and other flood hazard information can be used to identify the expected spatial extent of flooding from a 1-percent and 0.2-percent annual chance event. DFIRMS and FIRMS depict SFHAs—those areas subject to inundation from the 1-percent annual chance. Those areas are defined as follows:

- **Zones A1-30 and AE:** SFHAs that are subject to inundation by the base flood, determined using detailed hydraulic analysis. Base Flood Elevations are shown within these zones.
- **Zone A (Also known as Unnumbered A-zones):** SFHAs where no Base Flood Elevations or depths are shown because detailed hydraulic analyses have not been performed.
- **Zone AO:** SFHAs subject to inundation by types of shallow flooding where average depths are between 1 and 3 feet. These are normally areas prone to shallow sheet flow flooding on sloping terrain.
- **Zone VE, V1-30**: SFHAs along coasts that are subject to inundation by the base flood with additional hazards due to waves with heights of 3 feet or greater. Base Flood Elevations derived from detailed hydraulic analysis are shown within these zones.

- **Zone B and X (shaded)**: Zones where the land elevation as been determined to be above the Base Flood Elevation, but below the 500-year flood elevation. These zones are not SFHAs.

- **Zones C and X (unshaded)**: Zones where the land elevation has been determined to be above both the Base Flood Elevation and the 500-year flood elevation. These zones are not SFHAs.

Coastal SFHAs are of concern to San Mateo County, particularly along the areas of the coastline at or slightly above sea level. In 2013, FEMA issued additional information regarding the flood hazard area associated with coastal zones.

The NFIP depicts two coastal flood hazard zones on its DFIRMS:

- Zone VE, as described above
- Zone AE, where flood elevation includes wave heights less than 3 feet.

Post-storm field visits and laboratory tests throughout coastal areas of the United States have consistently confirmed that wave heights as low as 1.5 feet can cause significant damage to structures built without consideration of coastal hazards. DFIRMs recently published also include a line showing the Limit of Moderate Wave Action (LiMWA), the inland limit of the area expected to receive 1.5-foot or greater breaking waves during the 1-percent annual-chance flood event beyond the coastal VE zones and into the AE zone (Figure 6-1).

**Source:** FEMA 2014c

**Figure 6-1. Limit of Moderate Wave Action**

Addition of LiMWA area to DFIRMs allows communities and individuals to better understand flood risks to their properties. The LiMWA area alerts property owners on the coastal side of the line that despite locations within Zone AE, their properties may be affected by 1.5-foot or higher breaking waves, and may therefore be at risk.
significant risk during a 1-percent-annual-chance flood event. While not formally defined in NFIP regulations or mapped as a flood zone, the area between Zone VE and the LiMWA is called the Coastal A Zone. This area is subject to flood hazards associated with floating debris and high-velocity flow that can erode and scour building foundations and, in extreme cases, cause foundation failure (FEMA 2014a).

The current effective DFIRM for the County of San Mateo does not delineate LiMWA areas. Future map updates will include this information and should be used to develop additional coastal flooding mitigation items.

The Community Rating System

The Community Rating System (CRS) is a voluntary program within the NFIP that encourages floodplain management activities exceeding minimum NFIP requirements. Flood insurance premiums are discounted to reflect reduced flood risk resulting from community actions meeting the following three goals of the CRS:

- Reduce flood losses.
- Facilitate accurate insurance rating.
- Promote awareness of flood insurance.

For participating communities, flood insurance premium rates are discounted in increments of 5 percent. For example, a Class 1 community would receive a 45 percent premium discount, and a Class 9 community would receive a 5 percent discount. (Class 10 communities are those that do not participate in the CRS; they receive no discount.) The CRS classes for local communities are based on 18 creditable activities in the following categories:

- Public information
- Mapping and regulations
- Flood damage reduction
- Flood preparedness.

Figure 6-2 shows the nationwide number of CRS communities by class as of May 2016, when 1,391 communities were receiving flood insurance premium discounts under the CRS program.
CRS activities can help save lives and reduce property damage. Communities participating in the CRS represent a significant portion of the nation’s flood risk; over 66 percent of the NFIP’s policy base is within these communities. Communities receiving premium discounts through the CRS range from small to large and represent a broad mixture of flood risks, including both coastal and riverine flood risks.

Specific CRS ratings are detailed both within each jurisdiction’s annex and in Table 6-1 below. As indicated by the table, the discount associated with CRS partially depends on location of the property. Properties outside the SFHA receive smaller discounts—a 10% discount if the community is at Class 1-6 and a 5% discount if the community is at Class 7-9.

![Figure 6-2](image_url)

**Figure 6-2. CRS Communities by Class Nationwide as of May 2016**

**Table 6-1. CRS Participation in San Mateo County**

<table>
<thead>
<tr>
<th>NFIP Community Number</th>
<th>Community Name</th>
<th>CRS Entry Date</th>
<th>CRS Class</th>
<th>% Premium Discount, SFHA/Non-SFHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>060312</td>
<td>Atherton</td>
<td>Not applicable (N/A)</td>
<td>10</td>
<td>0/0</td>
</tr>
<tr>
<td>065016B</td>
<td>Belmont</td>
<td>N/A</td>
<td>10</td>
<td>0/0</td>
</tr>
<tr>
<td>060314</td>
<td>Brisbane</td>
<td>N/A</td>
<td>10</td>
<td>0/0</td>
</tr>
<tr>
<td>065019B</td>
<td>Burlingame</td>
<td>5/1/2012</td>
<td>9</td>
<td>5/5</td>
</tr>
<tr>
<td>060316</td>
<td>Colma</td>
<td>N/A</td>
<td>10</td>
<td>0/0</td>
</tr>
<tr>
<td>060317</td>
<td>Daly City</td>
<td>N/A</td>
<td>10</td>
<td>0/0</td>
</tr>
<tr>
<td>060708</td>
<td>East Palo Alto</td>
<td>10/1/11</td>
<td>8</td>
<td>10/5</td>
</tr>
<tr>
<td>060318</td>
<td>Foster City</td>
<td>N/A</td>
<td>10</td>
<td>0/0</td>
</tr>
<tr>
<td>060319</td>
<td>Half Moon Bay</td>
<td>N/A</td>
<td>10</td>
<td>0/0</td>
</tr>
<tr>
<td>060320</td>
<td>Hillsborough</td>
<td>N/A</td>
<td>10</td>
<td>0/0</td>
</tr>
<tr>
<td>060321</td>
<td>Menlo Park</td>
<td>N/A</td>
<td>10</td>
<td>0/0</td>
</tr>
</tbody>
</table>
With five communities in the County participating in CRS and receiving flood insurance premium reductions, many mitigation activities in this Hazard Mitigation Plan (HMP) were developed to be creditable activities under the CRS program. Therefore, successful implementation of this HMP offers potential to enhance the CRS classification.

6.2 Hazard Profile

The following information is largely extracted from the San Mateo County Flood Insurance Study (FEMA 2015):

- Heavy rains are the most frequent cause of flooding within San Mateo County jurisdictions, although coastal jurisdictions may also undergo flooding as a result of high winds, high tides, storm surge, and tsunami events.
- Flood problems occur primarily along streams located on the bayside. This flooding is shallow, with depths of less than 1 foot, and where railroad or highway embankments can become barriers, thus exacerbating ponding or sheetflow flooding.
- Flooding on the oceanside area of the County is confined primarily to well-defined riverine valleys, with flood surface extending uniformly across the floodplain. Flooding is typically associated with concurrent occurrences of high tides, large waves, and storm swells—often during winter. Storms from the southwest are often responsible for the most serious coastal flooding, and they typically bring other hazardous weather phenomena, including high winds, high tides, and heavy rains.
- Stormwater and overland flows exacerbate flooding and create shallow flood zones in some parts of the County, such as San Bruno, Crystal Springs, Lomita, and Holly Street Channels, as well as Belmont Creek. Inadequate or nonexistent stormwater facilities, as well as the aforementioned railroad and highway embankments, contribute to shallow flood issues.
Additionally, San Mateo County notes that its rural mountainous sections often act as a rain trap. Average rainfall in the rural regions can range from 30 to 45 inches per year, depending on locality. Its urban areas receive much less rain; for instance, Redwood City averages around 19 inches of rain per year (San Mateo County Sheriff 2015).

### 6.3 Types of Flood-Related Hazards

Flooding in San Mateo County typically occurs during the rainy winter season. Four types of flooding primarily affect the County: stormwater runoff, riverine, flash floods, and coastal floods.

#### Stormwater Runoff Floods

Stormwater flooding is a result of local drainage issues and high groundwater levels. Locally, heavy precipitation, especially during high lunar tide events, may induce flooding within areas other than delineated floodplains or along recognizable channels due to presence of storm system outfalls inadequate to provide gravity drainage into the adjacent body of water. If local conditions cannot accommodate intense precipitation through a combination of infiltration and surface runoff, water may accumulate and cause flooding problems. Flooding issues of this nature generally occur within areas with flat gradients, and generally increase with urbanization, which speeds accumulation of floodwaters because of impervious areas. Shallow street flooding can occur unless channels have been improved to account for increased flows (FEMA 1997). Numerous areas within the County undergo stormwater flooding that contributes to street and structure inundation.

Urban drainage flooding is caused by increased water runoff due to urban development and drainage systems. Drainage systems are designed to remove surface water from developed areas as quickly as possible to prevent localized flooding on streets and within other urban areas. These systems utilize a closed conveyance system that channels water away from an urban area to surrounding streams, and bypasses natural processes of water filtration through the ground, containment, and evaporation of excess water. Because drainage systems reduce the amount of time surface water takes to reach surrounding streams, flooding in those streams can occur more quickly and reach greater depths than prior to development within that area (FEMA 2008).

#### Riverine Floods

Riverine flooding is overbank flooding of rivers and streams. Natural processes of riverine flooding add sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers. Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas inundated by the 100-year flood with flood depths of only 1 to 3 feet. These areas are generally flooded by low-velocity sheet flows of water. Two types of flood hazards are generally associated with riverine flooding:

- **Inundation**—Inundation occurs when floodwater is present and debris flows through an area not normally covered by water. These events cause minor to severe damage, depending on velocity and depth of flows, duration of the flood event, quantity of logs and other debris carried by the flows, and amount and type of development and personal property along the floodwater’s path.
Channel Migration—Erosion of banks and soils worn away by flowing water, combined with sediment deposition, causes migration or lateral movement of a river channel across a floodplain. A channel can also abruptly change location (termed “avulsion”); a shift in channel location over a large distance can occur within as short a time as one flood event.

Natural stream channels in rural parts of San Mateo County typically can accommodate average rainfall amounts and mild storm systems; however, severe floods occur in years of abnormally high rainfall or unusually severe storms. During those periods of severe floods, high-velocity floodwaters carry debris over long distances, block stream channels, and create severe localized flooding. To control these floodwaters when they reach more urban areas, the County and its cities have developed various flood control districts and flood improvements, such as culverts, bridges, levees, channel alterations, and underground storm drains (San Mateo County Sheriff 2015).

Flash Floods
A flash flood is:

“a rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within 6 hours of the causative event (e.g., intense rainfall, dam failure). However, the actual time threshold may vary in different parts of the country. Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters” (National Weather Service [NWS] 2009).

Flash floods can tear out trees, undermine buildings and bridges, and scour new channels. In urban areas, flash flooding is an increasingly serious problem due to removal of vegetation and replacement of ground cover with impermeable surfaces such as roads, driveways, and parking lots. The greatest risk from flash floods is occurrence with little to no warning. Major factors in predicting potential damage are intensity and duration of rainfall, and steepness of watershed and streams.

Coastal Floods
Coastal floods are characterized by inundation of normally dry lands by ocean waters, often caused by storm surge associated with severe storms, tsunamis, or extreme high tide events that result in shallow flooding of low lying coastal areas. Storm surge floods typically result in coastal erosion, salinization of freshwater sources, and contamination of water supplies. These floods are also responsible for significant agricultural losses, loss of life, and damage to public and private structures and infrastructure. The San Mateo County coastline extends 55 miles and hosts both residential and agricultural communities (San Mateo County Sheriff 2015). The Pacific Ocean is the most likely source of coastal flooding in the County, although flooding from the San Francisco Bay is also a possibility during significant events.

San Mateo County has mitigated some of its vulnerability to coastal flooding through a series of levees originally installed for salt evaporation ponds in the southeastern part of the County and for flood protection in the north and central parts of the County. These levees were not designed to withstand floods at or greater than the 1-percent-annual-chance flood (San Mateo County Sheriff 2015).
Coastal flooding is becoming increasingly exacerbated by sea level rise as a result of climate change or relative sea level rise caused by local increase in the level of the ocean relative to land as a result of tectonic activity (National Oceanic and Atmospheric Administration [NOAA] no date).

6.3.1 Principal Flooding Sources

Principal flooding sources for San Mateo County as identified on FEMA flood maps include the following streams and waterbodies (for descriptions of each of these areas, refer to Volume I of the San Mateo County FIS [FEMA 2015]):

- Colma Creek
- San Bruno Channel
- Crystal Springs Channel
- Lomita Channel
- Belmont Creek
- Holly Street Channel
- San Francisquito Creek
- Montara Creek
- San Vincente Creek
- Denniston Creek
- El Granada Creek
- Woodhams Creek
- La Honda Creek
- Alpine Creek
- San Gregorio Creek
- Pescadero Creek
- Butano Creek
- Pacific Ocean

Over 20 creeks, channels, and waterbodies, including those identified as principal flooding sources, were assessed as part of the County’s FIS. In addition to the waterways above, the FIS identified areas at risk for potential tsunami inundation. The Cities of Half Moon Bay and Pacifica are both associated with potential tsunami issues (FEMA 2015). Additional information regarding the tsunami hazard is in Chapter 13.

Investigation of San Mateo County’s vulnerability to flooding can also include assessments of watershed locations. Every watershed has unique qualities that affect its response to rainfall. San Mateo County contains 34 watersheds, all of which are relatively small and drain into either the Pacific Ocean or San Francisco Bay. Unincorporated areas in the County contain 21 major watersheds. Except for Crystal Springs and San Francisquito, which both drain into the San Francisco Bay, all the rural watersheds drain into the Pacific Ocean (San Mateo County Sheriff 2015).

6.3.2 Past Events

Known flood events affecting San Mateo County between 1996 and 2015 are identified in Table 6-2. Flood events prior to 1996 are not included in the NOAA National Climatic Data Center (NCDC) Severe Storms Database, perhaps because they were labeled under another category such as Thunderstorm Wind. Additionally, 45 flood-related Presidentially-declared disasters (DR) or emergencies (EM) have occurred in the State of California since 1954 (all 45 events were non-tsunami flood events). This equates to a major, non-tsunami or hurricane-related flood event impacting the State every 1.37 years on average.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Locations</th>
<th>Deaths or Injuries</th>
<th>Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 10, 1996</td>
<td>Flood</td>
<td>San Mateo</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>January 1, 1997*</td>
<td>Flash Flood</td>
<td>Southwest Portion, Countywide</td>
<td>0</td>
<td>$0</td>
</tr>
</tbody>
</table>
TABLE 6-2. HISTORY OF FLOOD EVENTS

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Locations</th>
<th>Deaths or Injuries</th>
<th>Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2, 1997*</td>
<td>Flash Flood</td>
<td>Countywide</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>January 25, 1997</td>
<td>Flash Flood</td>
<td>Countywide</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>February 3, 1997</td>
<td>Flash Flood</td>
<td>Loma Mar</td>
<td>1 Death</td>
<td>$0</td>
</tr>
<tr>
<td>February 2, 1998*</td>
<td>Flash Flood</td>
<td>Pescadero, East Palo Alto</td>
<td>0</td>
<td>$200,000</td>
</tr>
<tr>
<td>February 6, 1998*</td>
<td>Flash Flood</td>
<td>Pescadero, East Palo Alto</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>February 7, 1998*</td>
<td>Flash Flood</td>
<td>Pescadero, East Palo Alto</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>February 13, 2000</td>
<td>Flash Flood</td>
<td>Pescadero</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>December 31, 2005</td>
<td>Flood</td>
<td>Countywide</td>
<td>0</td>
<td>$5,000,000</td>
</tr>
<tr>
<td>January 1, 2006</td>
<td>Flood</td>
<td>Countywide</td>
<td>0</td>
<td>$5,000,000</td>
</tr>
<tr>
<td>January 5, 2008</td>
<td>Coastal Flood</td>
<td>San Francisco Peninsula Coast</td>
<td>0</td>
<td>$5,000</td>
</tr>
<tr>
<td>January 25, 2008</td>
<td>Flash Flood</td>
<td>Moss Beach</td>
<td>0</td>
<td>$100,000</td>
</tr>
<tr>
<td>February 16, 2009</td>
<td>Flood</td>
<td>Pescadero</td>
<td>0</td>
<td>$8,000</td>
</tr>
<tr>
<td>January 19, 2010</td>
<td>Flood</td>
<td>Ladera</td>
<td>0</td>
<td>$15,000</td>
</tr>
<tr>
<td>January 20, 2010</td>
<td>Flood</td>
<td>Pescadero, San Carlos, San Carlos Airport</td>
<td>0</td>
<td>$65,000</td>
</tr>
<tr>
<td>December 29, 2010</td>
<td>Coastal Flood</td>
<td>San Francisco Peninsula Coast</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>December 23, 2012*</td>
<td>Flash Flood</td>
<td>Pescadero, Loma Mar</td>
<td>0</td>
<td>$500</td>
</tr>
<tr>
<td>December 2, 2014</td>
<td>Flood</td>
<td>Belmont, San Bruno</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>December 11, 2014</td>
<td>Flash Flood, Flood</td>
<td>San Mateo County</td>
<td>0</td>
<td>$505,500</td>
</tr>
<tr>
<td>February 6, 2015</td>
<td>Flood</td>
<td>Atherton, West Menlo Park</td>
<td>0</td>
<td>$0</td>
</tr>
</tbody>
</table>

*Multiple locations are associated with this event.
Source: NCDC Storm Events Database 2016, NBC Bay Area 2014

Descriptions of these flood events (from NCDC) are as follows:

**December 10, 1996**
Widespread urban flooding was reported throughout the County, and Highway 101 was reportedly underwater as a result of the flooding event.

**January 1, 1997**
Southwest portions of San Mateo County underwent heavy rainfall of approximately ½ inch per hour for several hours. Ground saturation prevented rainfall absorption. Pescadero Creek reached flood stage by late morning. By 10:00 a.m., La Honda Road was closed due to ground saturation and a resulting mudslide. Butano Creek flooded, closing Pescadero Road.

**February 3, 1997**
A levee breached along a dry creek bed, Arroyo Mocha. The breach cased damage to roads and property, and resulted in the death of an individual. Cascading effects caused flash flooding along San Francisquito Creek and Pescadero Creek.
February 14, 2000
Widespread rain with 24-hour accumulations of more than 5 inches occurred over the area during February 13th into February 14th. Urban and small stream flooding occurred in most counties of the area, including San Mateo. A number of houses in Daly City had to be abandoned and eventually destroyed due to mudslides that resulted from consecutive years of above-average rain.

December 31, 2005
Widespread flooding occurred throughout San Mateo County as a result of small stream overflow and poor drainage. Most damage occurred in East Palo Alto, the City of San Mateo, Daly City, Colma, Brisbane, San Bruno, South San Francisco, and Pacifica. Approximately 3 inches of rain fell on the area over a 24-hour period.

January 20, 2010
A significant storm brought strong winds and heavy rain to the San Francisco and Monterey Bay areas. This storm, the strongest of the week, developed over the Pacific Ocean with a strong parent low pressure based in the Gulf of Alaska. Areas of flooding occurred, causing problems mainly for vehicles. Heavy rain induced Pulgas Creek to overflow its banks and flood some classrooms at Central Middle School in San Carlos. Also, several streets were blocked off in low-lying areas just west of US Highway 101, including Taylor Avenue in San Carlos and parts of Rolison Road in Redwood City. In Atherton, officials closed March Road from Middlefield Road to Fair Oaks Avenue because a creek had begun to flood. Heavy rain caused Harbor Boulevard at the underpass of State Route 82 to flood, submerging a car to the base of its windows. The road was barricaded to stop anyone else from driving into the water. Belmont Creek flooding led to evacuation of a car repair business as 3 inches of water covered the floor.

February 6, 2015
A strong winter storm impacted California following nearly a month and a half of no rain and the driest January on record. The storm brought heavy rain, gusty winds, and damage to trees and power lines, along with some minor flooding of urban areas. Rainfall amounts were heaviest in the mountains, with 5-10 inches or more occurring. Heavy rain resulted in flooding of Southbound US 101 off-ramp in Atherton.

December 2015/January 2016
Although NOAA has not yet compiled 2016 data for the Severe Storms database, heavy rains associated with 2015/2016 winter El Niño storms will likely be included for parts of California. To mitigate impacts of expected associated flooding, the San Mateo County Department of Public Works and cities in the County set up two dozen sites where residents could pick up free sandbags (Patch.com 2016). Compared to previous years, this year’s winter storms were much more noteworthy—2016 El Niño rains brought more rain into the Bay Area in 2 days than during the past three Januaries combined (Mercury News 2016). In general, San Mateo County avoided severe damages and flooding from the rains. La Honda recorded the largest amount of rainfall in the County, at 1.5 inches, compared to 4.5 inches in Sonoma County (the area hardest hit by the storms). Other than debris, some power outages, and transportation accidents, the County did not report any major issues. Response personnel for the cities were prepared; they monitored debris build-up, helping to reduce potential
events (Silverfarb 2016). The worst effect of these rains was likely significant increase of coastal erosion in the City of Pacifica, placing residents along the cliff lines at risk of losing their homes.

6.3.3 Location

Flooding in San Mateo County has been documented by gage records, high water marks, damage surveys, and personal accounts. This documentation was the basis for the July 2015 Flood Insurance Study that is incorporated in the current effective DFIRMs. The DFIRMs are the most detailed and consistent data source available for determining flood extent. The July 2015 Flood Insurance Study is the sole source of data used in this risk assessment to map extents and locations of flood hazard areas, as shown on Figure 6-3.

![Figure 6-3. FEMA DFIRM Flood Hazard Areas, San Mateo County](image-url)
6.3.4 Frequency

San Mateo County has undergone 21 significant flooding events since 1996, most of which have been flash floods. Smaller floods may occur more frequently and be categorized under different hazard event types, typically Severe Weather or Severe Storms. Recurrence intervals and average annual numbers of events in San Mateo County were calculated based on data from 1996 to 2015 in the Storm Events Database. Coastal floods have a 10% chance of occurring in any given year, flash floods have a 55.6% chance, and other floods have a 40% chance of occurrence. Total estimated percent chance of occurrence for any flood type in a given year is 105%, meaning that flooding will likely continue to be an annual hazard.

6.3.5 Severity

The principal factors affecting flood damage are flood depth and velocity. The deeper and faster flood flows become, the more damage they can cause. Shallow flooding with high velocities can cause as much damage as deep flooding with slow velocity—especially when a channel migrates over a broad floodplain, redirecting high velocity flows and transporting debris and sediment. Flood severity is often evaluated by examining peak discharges. Peak flows used by FEMA to map floodplains within the planning area are listed in Table 6-3.

---

**Table 6-3. Summary of Peak Discharges – San Mateo County**

<table>
<thead>
<tr>
<th>Source/Location</th>
<th>Drainage Area (square miles)</th>
<th>Discharge (cubic feet/second [cfs])</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10-Percent</td>
<td>2-Percent</td>
</tr>
<tr>
<td><strong>16th Avenue Drainage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern Pacific Railroad Crossing</td>
<td>--4</td>
<td>--4</td>
</tr>
<tr>
<td>Highway 101</td>
<td>--4</td>
<td>--4</td>
</tr>
<tr>
<td><strong>19th Avenue Drainage Channel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At South Pacific Railroad Crossing</td>
<td>--4</td>
<td>--4</td>
</tr>
<tr>
<td>At Delaware Street</td>
<td>--4</td>
<td>--4</td>
</tr>
<tr>
<td>At Bermuda Drive</td>
<td>--4</td>
<td>--4</td>
</tr>
<tr>
<td>Highway 101</td>
<td>--4</td>
<td>--4</td>
</tr>
<tr>
<td><strong>Atherton Creek</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Railroad</td>
<td>5.0</td>
<td>350^1</td>
</tr>
<tr>
<td><strong>Belmont Creek</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At El Camino Real</td>
<td>2.5</td>
<td>570</td>
</tr>
<tr>
<td>At Highway 101</td>
<td>2.8</td>
<td>660</td>
</tr>
<tr>
<td><strong>Colma Creek</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At F Street</td>
<td>1.7</td>
<td>800</td>
</tr>
<tr>
<td>Below Hickey Boulevard Tributary</td>
<td>6.0</td>
<td>1,700</td>
</tr>
<tr>
<td>At USGS Gage in Orange Park</td>
<td>10.9</td>
<td>2,400</td>
</tr>
<tr>
<td>Below Spruce Branch</td>
<td>12.7</td>
<td>2,500</td>
</tr>
<tr>
<td>At San Francisco Bay</td>
<td>16.0</td>
<td>2,900</td>
</tr>
<tr>
<td><strong>Cordilleras Creek</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Alameda de las Pulgas</td>
<td>2.6</td>
<td>400</td>
</tr>
</tbody>
</table>
### Table 6-3. Summary of Peak Discharges – San Mateo County*

<table>
<thead>
<tr>
<th>Source/Location</th>
<th>Drainage Area (square miles)</th>
<th>Discharge (cubic feet/second [cfs])</th>
<th>10-Percent</th>
<th>2-Percent</th>
<th>1-Percent</th>
<th>0.2-Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>At Stanford Lane</td>
<td>3.1</td>
<td>460</td>
<td>900</td>
<td>1,120</td>
<td>1,700</td>
<td></td>
</tr>
<tr>
<td>At El Camino Real</td>
<td>3.3</td>
<td>470</td>
<td>940</td>
<td>1,170</td>
<td>1,800</td>
<td></td>
</tr>
<tr>
<td>Old County Road</td>
<td>3.3</td>
<td>470</td>
<td>620</td>
<td>680</td>
<td>1,190</td>
<td></td>
</tr>
<tr>
<td>Bayshore Freeway</td>
<td>3.6</td>
<td>525</td>
<td>700</td>
<td>850</td>
<td>1,490</td>
<td></td>
</tr>
<tr>
<td>Denniston Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Reservoir</td>
<td>3.2</td>
<td>700</td>
<td>1,200</td>
<td>1,400</td>
<td>1,800</td>
<td></td>
</tr>
<tr>
<td>Near Sheltercove Drive</td>
<td>3.8</td>
<td>780</td>
<td>1,300</td>
<td>1,600</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td>At Half Moon Bay</td>
<td>4.0</td>
<td>800</td>
<td>1,400</td>
<td>1,600</td>
<td>2,100</td>
<td></td>
</tr>
<tr>
<td>Easton Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Railroad</td>
<td>0.79</td>
<td>260</td>
<td>410</td>
<td>470</td>
<td>540</td>
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<td>El Granada Creek</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>At Reservoir</td>
<td>0.5</td>
<td>160</td>
<td>250</td>
<td>290</td>
<td>370</td>
<td></td>
</tr>
<tr>
<td>At Half Moon Bay</td>
<td>0.6</td>
<td>190</td>
<td>300</td>
<td>340</td>
<td>440</td>
<td></td>
</tr>
<tr>
<td>Holly Street Channel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Highway 101</td>
<td>0.4</td>
<td>240</td>
<td>370</td>
<td>420</td>
<td>420</td>
<td></td>
</tr>
<tr>
<td>Industrial Branch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Colma Creek</td>
<td>1.5</td>
<td>490</td>
<td>720</td>
<td>800</td>
<td>970</td>
<td></td>
</tr>
<tr>
<td>La Honda Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upstream of confluence with Woodhams Creek</td>
<td>10.0</td>
<td>1,800</td>
<td>3,100</td>
<td>3,600</td>
<td>4,800</td>
<td></td>
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<tr>
<td>Downstream of confluence with Woodhams Creek</td>
<td>10.9</td>
<td>1,900</td>
<td>3,300</td>
<td>3,800</td>
<td>5,200</td>
<td></td>
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<tr>
<td>At confluence with San Gregorio Creek</td>
<td>11.8</td>
<td>2,100</td>
<td>3,500</td>
<td>4,200</td>
<td>5,500</td>
<td></td>
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<tr>
<td>Laurel Creek</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Alameda de las Pulgas</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>970</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>At Otay</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>1,130</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>At George Hall School</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>1,420</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>At Highway 101</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>1,950</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Lomita Channel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Railroad³</td>
<td>___</td>
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<td>___</td>
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</tr>
<tr>
<td>Mills Creek</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>At Railroad</td>
<td>0.52</td>
<td>190</td>
<td>290</td>
<td>330</td>
<td>370</td>
<td></td>
</tr>
<tr>
<td>Mills Creek and Easton Creek</td>
<td></td>
<td>2.46</td>
<td>750</td>
<td>840</td>
<td>840</td>
<td>840</td>
</tr>
<tr>
<td>Montara Creek</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>At Riviera Street</td>
<td>0.80</td>
<td>220</td>
<td>360</td>
<td>420</td>
<td>560</td>
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<td>At Harte Street</td>
<td>1.30</td>
<td>310</td>
<td>530</td>
<td>620</td>
<td>830</td>
<td></td>
</tr>
<tr>
<td>At Pacific Ocean</td>
<td>1.70</td>
<td>380</td>
<td>640</td>
<td>760</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Navigable Slough</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Colma Creek</td>
<td>0.4</td>
<td>200</td>
<td>270</td>
<td>300</td>
<td>300</td>
<td></td>
</tr>
</tbody>
</table>

* Source/Location

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**Notes:**
- ___ indicates data not available.
- Table values are rounded to the nearest whole number.
- Discharge values are for 10-, 2-, and 1-Percent events for 0.2-Percent event.
- Additional notes for specific locations may be found in the body of the text.
### TABLE 6-3. SUMMARY OF PEAK DISCHARGES — SAN MATEO COUNTY*

<table>
<thead>
<tr>
<th>Source/Location</th>
<th>Drainage Area (square miles)</th>
<th>10-Percent</th>
<th>2-Percent</th>
<th>1 - Percent</th>
<th>0.2 - Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pescadero Creek</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Pescadero Road east of Town</td>
<td>53.3</td>
<td>7,700</td>
<td>13,900</td>
<td>16,700</td>
<td>20,000</td>
</tr>
<tr>
<td>At Pacific Ocean</td>
<td>81.3</td>
<td>11,000</td>
<td>20,000</td>
<td>24,000</td>
<td>29,000</td>
</tr>
<tr>
<td><strong>Ralston Creek and Burlingame Creek</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Railroad</td>
<td>1.65</td>
<td>500</td>
<td>800</td>
<td>930</td>
<td>1,100</td>
</tr>
<tr>
<td><strong>Redwood Creek</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At El Camino Real</td>
<td>5.2</td>
<td>1,200</td>
<td>2,11</td>
<td>2,500</td>
<td>3,200</td>
</tr>
<tr>
<td>At Broadway</td>
<td>8.8</td>
<td>1,800</td>
<td>3,200</td>
<td>3,800</td>
<td>4,800</td>
</tr>
<tr>
<td>At Bayshore Freeway</td>
<td>9.3</td>
<td>1,900</td>
<td>3,300</td>
<td>4,000</td>
<td>5,000</td>
</tr>
<tr>
<td><strong>Sanchez Creek</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Railroad</td>
<td>1.65</td>
<td>500</td>
<td>800</td>
<td>930</td>
<td>1,100</td>
</tr>
<tr>
<td><strong>Sanchez Creek, Ralston Creek, and Burlingame Creek</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Highway 101</td>
<td>4.65</td>
<td>1,100</td>
<td>1,600</td>
<td>1,600</td>
<td>1,600</td>
</tr>
<tr>
<td><strong>San Francisquito Creek</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At El Camino Real</td>
<td>40.6</td>
<td>4,350</td>
<td>7,050</td>
<td>8,280</td>
<td>9,850(^{11})</td>
</tr>
<tr>
<td>Upstream of Middlefield Road</td>
<td>41.6</td>
<td>4,350</td>
<td>7,100</td>
<td>8,330 ()</td>
<td></td>
</tr>
<tr>
<td>Downstream of Middlefield Road</td>
<td>41.6</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>6,965 ()</td>
<td></td>
</tr>
<tr>
<td>Downstream of Pope Street</td>
<td>41.6</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>6,250 ()</td>
<td></td>
</tr>
<tr>
<td>At Highway 101</td>
<td>41.7</td>
<td>4,400</td>
<td>6,020(^{7})</td>
<td>6,060(^{7})</td>
<td>6,300(^{7})</td>
</tr>
<tr>
<td><strong>San Francisquito Creek — Overflow</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Middlefield Road</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>640</td>
<td>--(^{4})</td>
</tr>
<tr>
<td>At Pope Street</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>730</td>
<td>--(^{4})</td>
</tr>
<tr>
<td>Combined Middlefield Road and Pope Street Overflows</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>1,154</td>
<td>--(^{4})</td>
</tr>
<tr>
<td>South of Highway 101</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>1,154</td>
<td>--(^{4})</td>
</tr>
<tr>
<td>North of Highway 101</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>570</td>
<td>--(^{4})</td>
</tr>
<tr>
<td><strong>San Gregorio Creek</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At upstream limit of study</td>
<td>9.3</td>
<td>1,800</td>
<td>3,000</td>
<td>3,500</td>
<td>4,500</td>
</tr>
<tr>
<td>Upstream of confluence with La Honda Creek</td>
<td>9.5</td>
<td>1,800</td>
<td>3,000</td>
<td>3,600</td>
<td>4,600</td>
</tr>
<tr>
<td>Downstream of confluence with La Honda Creek</td>
<td>21.3</td>
<td>3,300</td>
<td>4,800</td>
<td>6,900</td>
<td>9,300</td>
</tr>
<tr>
<td>Downstream of State Highway 84</td>
<td>21.8</td>
<td>3,300</td>
<td>4,800</td>
<td>6,900</td>
<td>9,300</td>
</tr>
<tr>
<td>At downstream limit of study</td>
<td>22.4</td>
<td>3,500</td>
<td>6,100</td>
<td>7,200</td>
<td>9,700</td>
</tr>
<tr>
<td><strong>San Mateo Creek</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At mouth (City of San Mateo)</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>1,017(^{7})</td>
<td>--(^{4})</td>
</tr>
<tr>
<td>At downstream side of South Humboldt Street and East Third Avenue</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>1,493(^{7})</td>
<td>--(^{4})</td>
</tr>
<tr>
<td>Approximately 400 feet downstream of Crystal Springs Road</td>
<td>33.3</td>
<td>--(^{4})</td>
<td>--(^{4})</td>
<td>2,124</td>
<td>--(^{4})</td>
</tr>
<tr>
<td><strong>San Vicente Creek</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At upper study limit</td>
<td>1.4</td>
<td>340</td>
<td>570</td>
<td>660</td>
<td>880</td>
</tr>
</tbody>
</table>

*Source: San Mateo County Hazard Mitigation Plan Update*
### Table 6-3. Summary of Peak Discharges — San Mateo County*

<table>
<thead>
<tr>
<th>Source/Location</th>
<th>Drainage Area (square miles)</th>
<th>Discharge (cubic feet/second [cfs])</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10-Percent</td>
<td>2-Percent</td>
</tr>
<tr>
<td>At Etheldore Street</td>
<td>1.7</td>
<td>400</td>
</tr>
<tr>
<td>At Pacific Ocean</td>
<td>1.9</td>
<td>430</td>
</tr>
<tr>
<td><strong>Spruce Branch</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Colma Creek</td>
<td>1.5</td>
<td>540</td>
</tr>
<tr>
<td><strong>Woodhams Creek</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Esmeralda Terrace</td>
<td>0.7</td>
<td>220</td>
</tr>
<tr>
<td>At confluence with La Honda Creek</td>
<td>0.9</td>
<td>270</td>
</tr>
</tbody>
</table>

Source: San Mateo County FIS, FEMA 2015

Note: All locations are at mouth unless otherwise noted. Locations do not include jurisdictional boundaries.

1 = Capacity of Atherton Creek box culvert
2 = 1,750 cfs spilled upstream of study area during the 1-percent annual chance flood event
3 = 170 cfs spilled to Redwood City during the 1-percent annual chance flood event
4 = Data not available
5 = 170 cfs spilled to Redwood City during the 1-percent annual chance flood event
6 = Flows reduced due to overflow into San Carlos and Redwood City
7 = Flows reduced due to upstream spill
8 = Values do not include overland flow from Belmont Creek
9 = Inflow to low area west of track; 1-percent annual chance outflow is 170 cfs.
10 = Flows limited by culvert capacity, ponding, and pump capacity
11 = Value reflects spills from the channel into Palo Alto

Although jurisdictions can implement mitigation and take preventative actions to significantly reduce severity and threat of flood events, some type of residual risk will always exist (i.e., risk of a hazard event occurring despite technical and scientific measures applied to reduce/prevent it). Threats associated with residual risk could include failure of a reservoir, a dam breach, or other infrastructure failure, or a severe flood event that exceeds flood design standards or drainage capacity.

#### 6.3.6 Warning Time

Potential warning time available to a community for response to a flooding threat depends on the time span between the first measurable rainfall and the first occurrence of flooding. The time duration necessary to recognize a flooding threat reduces potential warning time for a community that must take actions to protect lives and property. Another element that characterizes a community’s flood threat is length of time floodwaters remain above flood stage.

Because of the sequential pattern of weather conditions needed to cause serious flooding, occurrence of a flood without warning is unusual. Warning times for floods can be between 24 and 48 hours. Flash flooding can be less predictable, but populations in potential hazard areas can be warned in advance of flash flooding danger. NWS issues watches and warnings when forecasts indicate rivers may approach bank-full levels. Flood
extent or severity categories used by NWS include minor flooding, moderate flooding, and major flooding, based on property damage and public threat:

- **Minor Flooding** – Minimal or no property damage, but possibly some public threat or inconvenience.
- **Moderate Flooding** – Some inundation of structures and roads near streams. Some necessary evacuations of people and/or transfer of property to higher elevations.
- **Major Flooding** – Extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations (NWS 2011).

When a watch is issued, the public should prepare for the possibility of a flood. When a warning is issued, the public is advised to stay tuned to a local radio station for further information and be prepared to take quick action if needed. A warning means a flood is imminent, generally within 12 hours, or is occurring. Local media broadcast NWS warnings. Thresholds for flood warnings have been established on some of the major rivers in San Mateo County, based on available stream gage information, as follows:

- **Lower Crystal Springs Reservoir at Dam:**
  - Action state, minor flooding/initial flood stage, and major flood stage data are not available.
  - Moderate flooding is 284 feet.
- **San Francisquito Creek At Stanford University:**
  - Action state is 8 feet.
  - Moderate flooding is 9.5 feet.
  - Minor flooding/initial flood and major flood stages are not available (NWS 2016).

### 6.4 Secondary Hazards

The most problematic secondary hazard for riverine flooding is bank erosion, in some cases more harmful than actual flooding. This is especially true in the upper courses of rivers with steep gradients, where floodwaters may pass quickly and without much damage, but scour banks, edging properties closer to the floodplain or causing them to fall in. Flooding is also responsible for hazards such as landslides when high flows over-saturate soils on steep slopes, causing them to fail. Hazardous materials spills are also a secondary hazard of flooding if storage tanks rupture and spill into streams, rivers, or storm sewers. A secondary hazard along the coastal flood area is coastal erosion, which could augment high surf or tsunami/run-up incidents along VE zones.

In San Mateo County and particularly the City of Pacifica, coastal erosion is the secondary hazard of greatest concern. Within the last decade, abandonment of multiple homes, apartment buildings, and other buildings has been necessary, as shoreline and cliff erosions have led to falls of infrastructure and land off the cliff into the ocean. Coastal erosion usually becomes a much more acute hazard during winter, especially when El Niño storms and rains impact the coastline. The Red Cross and City officials have been working with residents forced to evacuate after their homes were labeled uninhabitable because of potential for collapse. Real-time impacts from coastal erosion are evident in online drone videos, for example at: [http://mashable.com/2016/01/26/coastal-erosion-pacifica/](http://mashable.com/2016/01/26/coastal-erosion-pacifica/) (Gilmer 2016).
6.5 Exposure

The Level 2 (user-defined) Hazards United States – Multi-Hazards (Hazus-MH) protocol was used to assess risk and vulnerability to flooding within the planning area. The model used census data at the block level and FEMA floodplain data, which have a level of accuracy acceptable for planning purposes. Where possible, Hazus-MH default data were enhanced by use of local Geographic Information System (GIS) data from county, state, and federal sources.

Importantly, the 1-percent-annual-chance flood hazard (100-year floodplain) and the 0.2-percent-annual-chance flood hazard (500-year floodplain) are very similar for the planning area. For the purposes of this risk assessment, exposure and associated effects were modeled for the 10-percent (10-year floodplain) and the 1-percent-annual-chance flood event. The 0.2 percent event is assumed to affect approximately the same number of people and property as the 1-percent event, although flood depths may be greater, resulting in more losses per property impacted.

6.5.1 Population

Population counts of those living in the floodplain within the planning area were generated by estimating percent of residential buildings in each jurisdiction within the 1-percent-annual-chance flood hazard areas and multiplying this by total population within the planning area. This approach yielded an estimated exposed population within the entire County of 24,388 persons within the 100-year floodplain (3.2 percent of the total County population). Exposure estimates are not available for the 10-percent-annual-chance flood. Table 6-4 lists population estimates by jurisdiction.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Population Exposed</th>
<th>% of Total Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Belmont</td>
<td>540</td>
<td>2.0%</td>
</tr>
<tr>
<td>Brisbane</td>
<td>6</td>
<td>0.1%</td>
</tr>
<tr>
<td>Burlingame</td>
<td>1,227</td>
<td>4.1%</td>
</tr>
<tr>
<td>Colma</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daly City</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>8,217</td>
<td>28.2%</td>
</tr>
<tr>
<td>Foster City</td>
<td>78</td>
<td>0.2%</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>29</td>
<td>0.2%</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>12</td>
<td>0.1%</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>4,410</td>
<td>13.3%</td>
</tr>
<tr>
<td>Millbrae</td>
<td>229</td>
<td>1.0%</td>
</tr>
<tr>
<td>Pacifica</td>
<td>748</td>
<td>1.9%</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>53</td>
<td>1.2%</td>
</tr>
<tr>
<td>Redwood City</td>
<td>763</td>
<td>0.9%</td>
</tr>
<tr>
<td>San Bruno</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
6.5.2 Property

Structures in the Floodplain

Table 6-5 summarizes total area and number of structures within the 1-percent-annual-chance flood zone by jurisdiction. Spatial analysis determined that 6,479 structures are within the 100-year floodplain, and 87 percent (5,656) of these structures are believed residential. Exposure estimates for the 10-percent-annual-chance flood hazard are not available.
### Table 6-5. Area and Structures in the 1-percent Annual Chance Floodplain

<table>
<thead>
<tr>
<th>Area in Floodplain (Acres)</th>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Agriculture</th>
<th>Religion</th>
<th>Government</th>
<th>Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>South San Francisco</td>
<td>13,121</td>
<td>257</td>
<td>88</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Woodside</td>
<td>103</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>15,005</td>
<td>302</td>
<td>28</td>
<td>1</td>
<td>25</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>78,437</strong></td>
<td><strong>5,656</strong></td>
<td><strong>583</strong></td>
<td><strong>174</strong></td>
<td><strong>31</strong></td>
<td><strong>19</strong></td>
<td><strong>3</strong></td>
<td><strong>6,479</strong></td>
</tr>
</tbody>
</table>

*a* Includes area acreage submerged by bay waters.

### Exposed Value

Table 6-6 summarizes estimated values of exposed buildings within the planning area. An estimated $15 billion worth of building and contents are exposed to the 1-percent-annual-chance flood zone, representing 4.7 percent of total replacement value within the planning area. Exposure estimates are not available for the 10-percent-annual-chance flood hazard area.

### Table 6-6. Value of Structures in the 1-percent Annual Chance Flood Hazard Area

<table>
<thead>
<tr>
<th>Structure</th>
<th>Value Exposed</th>
<th>Contents</th>
<th>Total</th>
<th>Replacement value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Belmont</td>
<td>$310,129,450</td>
<td>$260,033,735</td>
<td>$570,163,185</td>
<td>5.5%</td>
</tr>
<tr>
<td>Brisbane</td>
<td>$430,427,003</td>
<td>$416,870,538</td>
<td>$847,297,541</td>
<td>20.0%</td>
</tr>
<tr>
<td>Burlingame</td>
<td>$597,080,937</td>
<td>$479,516,306</td>
<td>$1,076,597,243</td>
<td>5.0%</td>
</tr>
<tr>
<td>Colma</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daly City</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>$574,618,898</td>
<td>$423,738,098</td>
<td>$998,356,996</td>
<td>17.0%</td>
</tr>
<tr>
<td>Foster City</td>
<td>$5,672,239</td>
<td>$2,836,119</td>
<td>$8,508,358</td>
<td>0.1%</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>$6,517,502</td>
<td>$5,280,871</td>
<td>$11,798,373</td>
<td>0.2%</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>$3,354,476</td>
<td>$1,677,238</td>
<td>$5,031,714</td>
<td>0.1%</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>$1,513,428,916</td>
<td>$1,513,743,477</td>
<td>$3,027,172,393</td>
<td>16.4%</td>
</tr>
<tr>
<td>Millbrae</td>
<td>$58,966,027</td>
<td>$43,358,336</td>
<td>$102,324,362</td>
<td>0.1%</td>
</tr>
<tr>
<td>Pacifica</td>
<td>$145,419,893</td>
<td>$124,626,167</td>
<td>$270,046,060</td>
<td>2.4%</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>$26,935,241</td>
<td>$22,131,741</td>
<td>$49,066,982</td>
<td>1.8%</td>
</tr>
<tr>
<td>Redwood City</td>
<td>$380,946,367</td>
<td>$415,452,764</td>
<td>$796,399,132</td>
<td>2.2%</td>
</tr>
<tr>
<td>San Bruno</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td>San Carlos</td>
<td>$1,296,296,795</td>
<td>$1,391,147,533</td>
<td>$2,687,444,328</td>
<td>13.3%</td>
</tr>
<tr>
<td>San Mateo</td>
<td>$1,147,909,623</td>
<td>$892,421,005</td>
<td>$2,040,330,628</td>
<td>4.7%</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>$862,088,157</td>
<td>$861,699,354</td>
<td>$1,723,787,512</td>
<td>5.4%</td>
</tr>
<tr>
<td>Woodside</td>
<td>$134,885</td>
<td>$67,442</td>
<td>$202,327</td>
<td>0.0%</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>$461,513,350</td>
<td>$420,790,755</td>
<td>$882,304,105</td>
<td>2.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$7,821,439,759</strong></td>
<td><strong>$7,275,391,479</strong></td>
<td><strong>$15,096,831,240</strong></td>
<td><strong>4.7%</strong></td>
</tr>
</tbody>
</table>
Note: Values shown are accurate only for comparisons among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

Land Use in the Floodplain

Some land uses are more vulnerable to flooding, such as single-family homes, while others are less vulnerable, such as agricultural land or parks. Table 6-7 lists building counts that intersect the 1-percent-annual-chance flood hazard area.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Agriculture</th>
<th>Religion</th>
<th>Government</th>
<th>Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
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<td><strong>31</strong></td>
<td><strong>19</strong></td>
<td><strong>3</strong></td>
<td><strong>13</strong></td>
<td><strong>6479</strong></td>
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</table>

The area of the floodplain that contains vacant, developable land is not known. This would be valuable information for gauging future development potential of the floodplain.

6.5.3 Critical Facilities and Assets

Table 6-8 summarizes critical facilities and assets within the 1-percent-annual-chance flood zone (100-year floodplain) of the planning area. Details appear in the following sections.
### TABLE 6-8. CRITICAL FACILITIES IN THE 1-PERCENT-ANNUAL-CHANCE FLOOD ZONE

<table>
<thead>
<tr>
<th>Facility</th>
<th>Medical and Health Services</th>
<th>Emergency Services</th>
<th>Government</th>
<th>Utilities</th>
<th>Transportation Infrastructure</th>
<th>Hazardous Materials</th>
<th>Community Economic Facilities</th>
<th>Other Assets</th>
<th>Total</th>
</tr>
</thead>
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<td><strong>2</strong></td>
<td><strong>8</strong></td>
<td><strong>142</strong></td>
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</tr>
</tbody>
</table>

**Toxic Release Inventory Reporting Facilities**

Toxic Release Inventory (TRI) facilities are known to manufacture, process, store, or otherwise use certain chemicals above minimum thresholds. If damaged by a flood, these facilities could release chemicals that cause cancer or other human health effects, significant adverse acute human health effects, or significant adverse environmental effects (U.S. Environmental Protection Agency [EPA] 2015). During a flood event, containers holding these materials can rupture and leak into the surrounding area, disastrously affecting the environment and residents. One facility within the 1-percent-annual-chance flood zone is a TRI reporting facility.
Utilities and Infrastructure

It is important to determine who may be at risk if flooding damages infrastructure. Roads blocked or damaged can isolate residents, and can prevent access throughout the planning area for emergency service providers attempting to reach vulnerable populations or make repairs. Washout or blockage of bridges by floods or debris also can isolate individuals or segments of the population. Flooded or backed-up water and sewer systems can trigger health problems. Underground utilities can be damaged. Dikes can fail or be overtopped, inundating the land that they protect. The following sections describe types of critical infrastructure.

Roads

The following major roads within the planning area pass through the 1-percent-annual-chance flood zone (100-year floodplain), and thus are exposed to flooding:

- State Highway 1
- State Highway 92
- US Highway 101
- State Highway 82
- State Highway 109
- Interstate 380
- State Highway 84
- State Highway 114
- State Highway 114

Some of these roads were built above the flood level, and others function as levees to prevent flooding. Still, during severe flood events, these roads can be blocked or damaged, preventing access to some areas.

Bridges

Flooding events can significantly impact road bridges, important because many provide the only ingress and egress to some neighborhoods. An analysis indicated that 62 bridges are within or cross over the 1-percent-annual-chance flood zone (100-year floodplain).

Levees

Historically, levees have been used to control flooding in portions of San Mateo County. The County constructed levees both for flood protection (in the north and central portions of the County) and for salt evaporation ponds (in the southeast portion of the County). The County does not believe these levees could withstand intensities of a 1-percent-annual-chance flood. Additionally, coastal flooding from San Francisco Bay circumvents levees near the Bay, leading to flooding within the residential area next to San Francisquito Creek on the east side of the City. These risk estimates are based on current flood levels and do not account for potential sea level rise, which would exacerbate vulnerability and even further reduce ability of the levees to prevent/control flooding. Details on San Mateo County levees could not be supplemented by the U.S. Army Corps of Engineers (USACE) National Levee Database (NLD). Although the NLD contains records of the majority of levees within the USACE system, it does not include records of all levees in the United States, which include the levees in San Mateo County.

Levee failures could place large numbers of people and great amounts of property at risk. Unlike dams, levees do not serve any purpose beyond providing flood protection and (less frequently) recreational space for residents. A levee failure could be devastating, depending on severity of flooding and amount of land development present. In addition to damaging buildings, infrastructure, trees, and other large objects, levee failure can result in significant water quality and debris disposal issues. Severe erosion is also a consideration.
Presence and effects of levee systems in San Mateo County are not reflected on the DFIRM, meaning that areas, structures, and populations vulnerable to failures of those levees cannot be determined. However, because the County estimates that the levees in their current state could not withstand a 1-percent-chance annual flood, reflections of effects of the levees on the DFIRM would not be reliable anyway. The 2016 preliminary DFIRMs do account for estimated sea level rise; however, because not yet finalized, these maps could not be utilized to contribute to vulnerability estimates of flooding within leveed areas. Following approval of the 2016 DFIRMs, San Mateo County will consider the extent to which the levees must be updated as a future mitigation action item, and consider protection from sea level rise. Action may not be considered until the next HMP update, and levee vulnerability will also be explored in further detail.

**Water and Sewer Infrastructure**

Water and sewer systems can be affected by flooding. Floodwaters can back up drainage systems, causing localized flooding. Culverts can be blocked by debris from flood events, also triggering localized urban flooding. Floodwaters can enter and thus contaminate drinking water supplies. Sewer systems can back up, spilling wastewater into homes, neighborhoods, rivers, and streams.

### 6.5.4 Environment

Flooding is a natural event, and floodplains provide many natural and beneficial functions. Nonetheless, with human development factored in, flooding can impact the environment in negative ways. Migrating fish can wash into roads or over dikes into flooded fields, with no possibility of escape. Pollution from roads, such as oil, and hazardous materials can wash into rivers and streams. During floods, these can settle onto normally dry soils, polluting them for agricultural uses. Human development such as bridge abutments and levees can increase stream bank erosion, causing rivers and streams to migrate into non-natural courses.

### 6.6 Vulnerability

Many areas exposed to flooding may not undergo serious flooding or flood damage. This section describes vulnerabilities in terms of population, property, infrastructure, and environment.

#### 6.6.1 Population

A geographic analysis of demographics by application of the Hazus-MH model identified populations vulnerable to the flood hazard as follows:

- **Economically Disadvantaged Populations**—An estimated 9.1 percent of households within the 1-percent-annual-chance flood zone (100-year floodplain) are economically disadvantaged (household incomes of $20,000 or less).
- **Population over 65 Years Old**—An estimated 9.1 percent of the population within the 1-percent-annual-chance flood zone (100-year floodplain) is over 65 years old.
- **Population under 16 Years Old**—An estimated 26 percent of the population within the 1-percent-annual-chance flood zone (100-year floodplain) is under 16 years of age.
Additionally, an estimated 100,000+ persons in San Mateo County commute on any given day. This segment of the population is also considered vulnerable to the flood hazard. Commuters whose workplaces or major transportation routes are within or near the 1-percent-annual-chance flood zone (100-year floodplain) may be especially vulnerable.

Impacts on Persons and Households

Table 6-9 summarizes estimated impacts on persons in the planning area within the 10-percent-annual-chance flood zone (10-year floodplain) and 1-percent-annual-chance flood zone (100-year floodplain).

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<th>10 Percent Annual Chance</th>
<th>1 Percent Annual Chance</th>
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</thead>
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<td>Persons Requiring Short-Term Shelter</td>
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<td>Colma</td>
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<td>0</td>
</tr>
<tr>
<td>Daly City</td>
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<td>0</td>
</tr>
<tr>
<td>East Palo Alto</td>
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<td>0</td>
</tr>
<tr>
<td>Foster City</td>
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</tr>
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<td>Half Moon Bay</td>
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</tr>
<tr>
<td>Hillsborough</td>
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</tr>
<tr>
<td>Menlo Park</td>
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</tr>
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<td>Millbrae</td>
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</tr>
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<td>241</td>
</tr>
<tr>
<td>Total</td>
<td>302</td>
<td>241</td>
</tr>
</tbody>
</table>

a. Hazus-MH results in this table are not intended to be exact estimates of damage after a hazard event. They represent generalized estimates of damage that may occur as a result of the modeled scenario, based on available data.

Public Health and Safety

Flooding and their aftermath present the following threats to public health and safety:

- **Unsafe food**—Floodwaters contain disease-causing bacteria, dirt, oil, human and animal waste, and farm and industrial chemicals. They carry away whatever lies on the ground and upstream. Their
contact with food items, including food crops in agricultural lands, can render that food unsafe to eat and hazardous to human health. Power failures caused by floods damage stored food. Refrigerated and frozen foods are affected during the outage periods, and must be carefully monitored and examined prior to consumption. Foods kept inside cardboard, plastic bags, jars, bottles, and paper packaging are subject to disposal if contaminated by floodwaters. Even though the packages do not appear to be wet, they may be unhygienic with mold contamination and deteriorate rapidly.

- **Contaminated drinking and washing water and poor sanitation**—Flooding impairs clean water sources with pollutants. Contact with the contaminants—whether through direct food intake, vector insects such as flies, unclean hands, or dirty plates and utensils—can result in waterborne illnesses and life-threatening infectious disease. The pollutants also saturate into groundwater or can infiltrate sanitary sewer lines through the ground. Wastewater treatment plants, if flooded and caused to malfunction, can be overloaded with polluted runoff waters and sewage beyond their disposal capacity, resulting in backflows of raw sewage to homes and low-lying grounds. Private wells can be contaminated or damaged severely by floodwaters, while private sewage disposal systems can become a cause of infection if broken or overflowing. Unclean drinking and washing water and sanitation, coupled with lack of adequate sewage treatment, can lead to disease outbreaks.

- **Mosquitoes and animals**—Prolonged rainfall and floods provide new breeding grounds for mosquitoes—wet areas and stagnant pools—and can lead to an increase in the number of mosquito-borne diseases such as malaria and dengue and West Nile fevers. Rats and other rodents and wild animals also can carry viruses and diseases. The public should avoid such animals and should dispose of dead animals in accordance with guidelines issued by local animal control authorities. Leptospirosis—a bacterial disease associated predominantly with rats—often accompanies floods in developing countries, although the risk is low in industrialized regions unless cuts or wounds have direct contact with disease-contaminated floodwaters or animals.

- **Mold and mildew**—Excessive exposure to mold and mildew can cause flood victims—especially those with allergies and asthma—to contract upper respiratory diseases, triggering cold-like symptoms. Molds grow in as short a period as 24 to 48 hours in wet and damp areas of buildings and homes that have not been cleaned after flooding, such as water-infiltrated walls, floors, carpets, toilets, and bathrooms. Very small mold spores can be easily inhaled by human bodies and, in large enough quantities, cause allergic reactions, asthma episodes, and other respiratory problems. Infants, children, elderly people, and pregnant women are considered most vulnerable to mold-induced health problems.

- **Carbon monoxide poisoning**—Carbon monoxide poisoning is a potential hazard after major floods. In the event of power outages following floods, flood victims tend to use alternative sources of fuels for heating or cooking inside enclosed or partly enclosed houses, garages, or buildings without adequate levels of air ventilation. Carbon monoxide can be found in combustion fumes such as those generated by small gasoline engines, stoves, generators, lanterns, gas ranges, or burning of charcoal or wood. Built-up carbon monoxide from these sources can poison people and animals.
Hazard Mitigation Plan

SECTION 2 - Chapter 6
Flood

- **Hazards when reentering and cleaning flooded homes and buildings**—Flooded buildings can pose significant health hazards to people entering and cleaning damaged buildings or working to restore utility service after floodwaters recede. Electrical power systems, including fallen power lines, can become hazardous. Gas leaks from pipelines or propane tanks can trigger fire and explosion. Flood debris—such as broken bottles, wood, stones, and walls—may cause wounds and injuries to those removing contaminated mud and cleaning damaged buildings. Containers of hazardous chemicals, including pesticides, insecticides, fertilizers, car batteries, propane tanks, and other industrial chemicals, may be hidden or buried under flood debris. A health hazard can also occur when hazardous dust and mold in ducts, fans, and ventilators of air-conditioning and heating equipment are circulated through a building and inhaled by those engaged in cleanup and restoration.

- **Mental stress and fatigue**—Having experienced a devastating flood and seen loved ones lost or injured and homes damaged or destroyed, flood victims can experience long-term psychological impact. The expense and effort required to repair flood-damaged homes imposes severe financial and psychological burdens on the people affected, in particular the unprepared and uninsured. Post-flood recovery—especially when prolonged—can cause mental disorders, anxiety, anger, depression, lethargy, hyperactivity, sleeplessness, and, in an extreme case, suicide. Behavior changes may also occur in children, such as increases in bed-wetting and aggression. The affected also harbor long-term concern that their homes can flood again in the future.

Current loss estimation models such as Hazus-MH are not equipped to measure public health impacts such as these. The best preparation for these effects includes awareness that they can occur, education of the public on prevention, and planning to deal with them during responses to flood events.

### 6.6.2 Property

**Structural and Non-Structural Loss**

Hazus-MH calculates losses to structures from flooding via examinations of depth of flooding and types of structure. Using historical flood insurance claim data, Hazus-MH estimates percentage of damage to structures and their contents by applying established damage functions to an inventory. For this analysis, local data on facilities were used instead of the default inventory data provided with Hazus-MH.

The analysis is summarized in Table 6-10 and Table 6-11 for the 10-percent-annual-chance event (10-year flood) and 1-percent-annual-chance event (100-year flood), respectively. Loss estimates from the 1-percent-annual-chance flood (100-year floodplain) represent 7.5 percent of total exposure to the 1-percent-annual-chance flood (100-year floodplain) and less than 1 percent of total replacement value within the planning area.

| TABLE 6-10. LOSS ESTIMATES FOR 10-PERCENT-ANNUAL-CHANCE EVENT |
|----------------------------------|------------------|------------------|------------------|------------------|
| **Structures Impacted** | **Estimated Loss Associated with 10-year flood** | **% of Total Replacement value** |
| Structure | Contents | Total | Structure | Contents | Total | Structure | Contents | Total |
| Atherton | 0 | $0 | $0 | $0 | 0.0% |
| Belmont | 0 | $0 | $0 | $0 | 0.0% |
### TABLE 6-10. LOSS ESTIMATES FOR 10-PERCENT-ANNUAL-CHANCE EVENT

<table>
<thead>
<tr>
<th>Structures Impacted(^a)</th>
<th>Estimated Loss Associated with 10-year flood</th>
<th>% of Total Replacement value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Structure</td>
<td>Contents</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Burlingame</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Colma</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Daly City</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Foster City</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Millbrae</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Pacifica</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Redwood City</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>San Bruno</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>San Carlos</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>San Mateo</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Woodside</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>14</td>
<td>$452,557</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>$452,557</td>
</tr>
</tbody>
</table>

\(^a\) Impacted structures have finished floor elevations below the tsunami water surface elevation, and are most likely to undergo significant damage during a tsunami event.

Note: Values shown are accurate only for comparisons among results in this HMP. See Section 2, Chapter 1 for a discussion of data limitations.

---

### TABLE 6-11. LOSS ESTIMATES FOR 1-PERCENT-ANNUAL-CHANCE EVENT

<table>
<thead>
<tr>
<th>Structures Impacted(^a)</th>
<th>Estimated Loss Associated with 100-year flood</th>
<th>% of Total Replacement value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Structure</td>
<td>Contents</td>
</tr>
<tr>
<td>Atherton</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Belmont</td>
<td>17</td>
<td>$7,943,732</td>
</tr>
<tr>
<td>Brisbane</td>
<td>70</td>
<td>$150,636,560</td>
</tr>
<tr>
<td>Burlingame</td>
<td>208</td>
<td>$29,985,664</td>
</tr>
<tr>
<td>Colma</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Daly City</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>686</td>
<td>$32,638,232</td>
</tr>
<tr>
<td>Foster City</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>2</td>
<td>$1,982,901</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>445</td>
<td>$25,292,706</td>
</tr>
</tbody>
</table>

---

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**SECTION 2 - Chapter 6**

Flood...
Table 6-11. Loss Estimates for 1-percent-annual-chance Event

<table>
<thead>
<tr>
<th>Structures Impacted</th>
<th>Estimated Loss Associated with 100-year flood</th>
<th>% of Total Replacement value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Structure</td>
<td>Contents</td>
</tr>
<tr>
<td>Millbrae</td>
<td>54</td>
<td>$2,278,862</td>
</tr>
<tr>
<td>Pacifica</td>
<td>94</td>
<td>$7,559,058</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>4</td>
<td>$2,303,649</td>
</tr>
<tr>
<td>Redwood City</td>
<td>66</td>
<td>$6,545,094</td>
</tr>
<tr>
<td>San Bruno</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>San Carlos</td>
<td>205</td>
<td>$23,093,350</td>
</tr>
<tr>
<td>San Mateo</td>
<td>1,206</td>
<td>$99,239,555</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>259</td>
<td>$17,055,119</td>
</tr>
<tr>
<td>Woodside</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>223</td>
<td>$31,194,421</td>
</tr>
<tr>
<td>Total</td>
<td>3,539</td>
<td>$437,748,903</td>
</tr>
</tbody>
</table>

a. Impacted structures have finished floor elevations below the tsunami water surface elevation, and are most likely to undergo significant damage during a tsunami event.

Note: Values shown are accurate only for comparisons among results in this HMP. See Section 2, Chapter 1 for a discussion of data limitations.

Flood-Caused Debris

The Hazus-MH analysis estimated the amount of flood-caused debris within the planning area generated by flooding, as summarized in Table 6-12.

Table 6-12. Estimated Flood-Caused Debris

<table>
<thead>
<tr>
<th></th>
<th>10-percent-annual-chance flood</th>
<th>1-percent-annual-chance flood</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Debris to Be Removed (tons)a</td>
<td>Estimated Number of Truckloadsb</td>
</tr>
<tr>
<td>Atherton</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Belmont</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Burlingame</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Colma</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Daly City</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Foster City</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Millbrae</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pacifica</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Redwood City</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
**TABLE 6-12. ESTIMATED FLOOD-CAUSED DEBRIS**

<table>
<thead>
<tr>
<th></th>
<th>10-percent-annual-chance flood</th>
<th>1-percent-annual-chance flood</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Debris to Be Removed (tons)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Estimated Number of Truckloads&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>San Bruno</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>San Carlos</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>San Mateo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Woodside</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>2,030</td>
<td>81</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,041</strong></td>
<td><strong>82</strong></td>
</tr>
</tbody>
</table>

<sup>a</sup> Debris generation estimates were based on updated general building stock dataset at a Census Block analysis level.

<sup>b</sup> Hazus-MH assumes 25 tons/trucks.

Note: Values shown are accurate only for comparison among results in this HMP. See Section 2, Chapter 1 for a discussion of data limitations.

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**National Flood Insurance Program**

Unincorporated San Mateo County and all incorporated planning partner municipalities within the County are participants in the NFIP; all are also currently in good standing with the provisions of the NFIP. Maintaining compliance under the NFIP is an important component of flood risk reduction and all NFIP communities have committed to maintain compliance with the NFIP. Multiple jurisdictions within San Mateo County are participants in the NFIP, but do not have any SFHAs within their boundaries. These jurisdictions maintain minimum requirements for NFIP communities with no SFHAs, and are noted in jurisdictional annexes in Volume II. NFIP participants with an identified SFHA will maintain compliance through continuing to enforce floodplain management regulations that meet minimum NFIP criteria. Additionally, all communities have identified mitigation initiatives, further documenting their commitment to NFIP compliance and good standing.

Table 6-13 lists flood insurance statistics that help identify vulnerability within the planning area. More than 6,200 policies are in force providing more than $1.75 billion in insurance. According to FEMA statistics, 853 flood insurance claims were paid between January 1, 1978, and December 31, 2015, for a total of $9.3 million, an average of $10,923 per claim.

Properties constructed after adoption of a FIRM or DFIRM are considered less vulnerable to flooding because they were constructed after adoption of regulations and codes to decrease vulnerability. Properties built before adoption of a FIRM or DFIRM are more vulnerable to flooding because either they do not meet code or are within hazardous areas. The first flood maps of the planning area became available as early as 1971; however, most FIRMs were not available until the 1980s.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>10/28/1977</td>
<td>41</td>
<td>$13,256,000</td>
<td>$17,084</td>
<td>6</td>
<td>$235,254.45</td>
</tr>
<tr>
<td>Belmont</td>
<td>03/09/1982</td>
<td>105</td>
<td>$37,675,300</td>
<td>$193,183</td>
<td>30</td>
<td>$170,678.17</td>
</tr>
<tr>
<td>Brisbane</td>
<td>03/29/1983</td>
<td>26</td>
<td>$12,650,000</td>
<td>$86,440</td>
<td>5</td>
<td>$5,216.07</td>
</tr>
<tr>
<td>Burlingame</td>
<td>09/16/1981</td>
<td>295</td>
<td>$81,952,600</td>
<td>$424,853</td>
<td>70</td>
<td>$285,343.40</td>
</tr>
<tr>
<td>Colma</td>
<td>11/01/1979</td>
<td>4</td>
<td>$3,600,000</td>
<td>$12,840</td>
<td>2</td>
<td>$1,795.76</td>
</tr>
<tr>
<td>Daly City</td>
<td>07/31/1979</td>
<td>63</td>
<td>$10,164,000</td>
<td>$14,992</td>
<td>30</td>
<td>$193,521.77</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>09/19/1984</td>
<td>925</td>
<td>$218,408,500</td>
<td>$1,140,945</td>
<td>33</td>
<td>$197,483.82</td>
</tr>
<tr>
<td>Foster City</td>
<td>01/07/1977</td>
<td>257</td>
<td>$81,280,900</td>
<td>$98,861</td>
<td>7</td>
<td>$37,157.09</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>08/08/1979</td>
<td>104</td>
<td>$34,439,900</td>
<td>$58,904</td>
<td>7</td>
<td>$56,296.05</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>09/01/1981</td>
<td>58</td>
<td>$18,978,100</td>
<td>$36,837</td>
<td>9</td>
<td>$24,962.63</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>02/04/1981</td>
<td>862</td>
<td>$234,099,300</td>
<td>$1,075,579</td>
<td>31</td>
<td>$241,351.37</td>
</tr>
<tr>
<td>Millbrae</td>
<td>09/30/1981</td>
<td>59</td>
<td>$18,021,100</td>
<td>$62,013</td>
<td>38</td>
<td>$151,186.94</td>
</tr>
<tr>
<td>Pacifica</td>
<td>02/04/1981</td>
<td>370</td>
<td>$104,294,600</td>
<td>$283,622</td>
<td>110</td>
<td>$756,405.53</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>10/17/1978</td>
<td>42</td>
<td>$12,542,599</td>
<td>$43,104</td>
<td>24</td>
<td>$670,141.76</td>
</tr>
<tr>
<td>Redwood City</td>
<td>05/17/1982</td>
<td>315</td>
<td>$97,688,100</td>
<td>$254,375</td>
<td>37</td>
<td>$438,904.88</td>
</tr>
<tr>
<td>San Bruno</td>
<td>03/30/1981</td>
<td>11</td>
<td>$1,697,400</td>
<td>$12,467</td>
<td>18</td>
<td>$96,688.67</td>
</tr>
<tr>
<td>San Carlos</td>
<td>09/15/1977</td>
<td>237</td>
<td>$82,788,500</td>
<td>$330,704</td>
<td>56</td>
<td>$163,319.72</td>
</tr>
<tr>
<td>San Mateo (City)</td>
<td>03/30/1981</td>
<td>1,589</td>
<td>$436,456,200</td>
<td>$1,903,073</td>
<td>76</td>
<td>$136,933.83</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>09/02/1981</td>
<td>379</td>
<td>$114,596,500</td>
<td>$400,401</td>
<td>70</td>
<td>$3,103,895.86</td>
</tr>
<tr>
<td>Woodside</td>
<td>11/15/1979</td>
<td>31</td>
<td>$8,804,000</td>
<td>$13,744</td>
<td>16</td>
<td>$342,979.80</td>
</tr>
<tr>
<td>Unincorporated San Mateo County</td>
<td>07/05/1984</td>
<td>457</td>
<td>$133,178,200</td>
<td>$575,964</td>
<td>178</td>
<td>$2,293,176.01</td>
</tr>
<tr>
<td>Total</td>
<td>N/A</td>
<td>6,230</td>
<td>$1,756,571,799</td>
<td>$7,039,985</td>
<td>853</td>
<td>$9,317,330</td>
</tr>
</tbody>
</table>

**Repetitive Loss**

A repetitive loss property is defined by FEMA as an NFIP-insured property that has undergone any of the following since 1978, regardless of any changes in ownership:

- Four or more paid losses exceeding $1,000
- Two paid losses exceeding $1,000 within any rolling 10-year period
- Three or more paid losses equaling or exceeding the current value of the insured property.

Repetitive loss properties make up only 1 percent of flood insurance policies in force nationally, yet they account for 40 percent of the nation’s flood insurance claim payments (National Wildlife Federation 2006). In 1998, FEMA reported that the NFIP’s 75,000 repetitive loss structures have already cost $2.8 billion in flood insurance payments, and that numerous other flood-prone structures at high risk remain within the floodplain.
The government has instituted programs encouraging communities to identify and mitigate causes of repetitive losses. A report on repetitive losses by the National Wildlife Federation found that 20 percent of these properties are outside any mapped 1-percent-annual-chance (100-year) floodplain. The key identifiers for repetitive loss properties are existence of flood insurance policies and claims paid by the policies. With potential for minor flood events every year and major events every 5 to 7 years, the County and its planning partners consider all mapped floodplain areas susceptible to repetitive flooding.

FEMA-sponsored programs, such as the CRS, require participating communities to identify repetitive loss areas. A repetitive loss area is the portion of a floodplain hosting structures that FEMA has identified as meeting the definition of repetitive loss. Identifying repetitive loss areas helps identify structures at risk but not on FEMA’s list of repetitive loss structures because no flood insurance policy was in force at the time of loss.

The San Mateo County planning area contains no repetitive loss structures and three severe repetitive loss (SRL) properties per the FEMA definition above:

<table>
<thead>
<tr>
<th>Jurisdiction Name</th>
<th>Number of SRL Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millbrae</td>
<td>1</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>1</td>
</tr>
<tr>
<td>Unincorporated San Mateo County</td>
<td>1</td>
</tr>
</tbody>
</table>

Severe repetitive loss properties in San Mateo County are shown on
Figure 6-4.
6.6.3 Critical Facilities and Assets

Hazus-MH was used to estimate flood loss potential of critical facilities exposed to the flood risk. Using depth/damage function curves to estimate percent of damage to the building and contents of critical facilities, Hazus-MH correlates these estimates to estimate functional down-time (estimated time necessary to restore a facility to 100 percent of its functionality). This helps gauge how long the planning area could have limited usage of facilities deemed critical to flood response and recovery. The Hazus-MH critical facility results are summarized in Table 6-14.
On average, critical facilities would undergo 3.72 percent damage to the structure and 19.82 percent damage to contents during a 1-percent-annual-chance (100-year) flood event. Estimated time to restore these facilities to 100 percent of functionality is 492 days.

<table>
<thead>
<tr>
<th>Number of Facilities Affected</th>
<th>Average % of Total Value Damaged</th>
<th>Days to 100% Functionality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical and Health Services</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Emergency Services</td>
<td>5</td>
<td>2.92</td>
</tr>
<tr>
<td>Government</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Utilities</td>
<td>34</td>
<td>10.40</td>
</tr>
<tr>
<td>Transportation Infrastructure</td>
<td>69</td>
<td>0.93</td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>24</td>
<td>6.07</td>
</tr>
<tr>
<td>Community Economic Facilities</td>
<td>2</td>
<td>0.0</td>
</tr>
<tr>
<td>Other Assets</td>
<td>8</td>
<td>4.62</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>142</strong></td>
<td><strong>3.72</strong></td>
</tr>
</tbody>
</table>

### 6.6.4 Environment

The environment vulnerable to flood hazard is the same as the environment exposed to the hazard. Loss estimation platforms such as Hazus-MH are not currently equipped to measure environmental impacts of flood hazards. The best gauge of vulnerability of the environment would be a review of damage from past flood events. Loss data that segregates damage to the environment were not available at the time of this HMP. Capturing this data from future events could be beneficial in measuring vulnerability of the environment for future updates.

Additionally, while the vulnerability assessment typically focuses on human vulnerability to flood events, the opposite is also worth noting. Floodplains have many natural and beneficial functions; however, due to negative impacts of floods, many structural and other measures have been devised to limit how far a floodplain can extend. Disruption of natural systems can have long-term consequences for entire regions; however, this potential impact has only recently been noted. Some well-known, water-related functions of floodplains (noted by FEMA) include:

- Natural flood and erosion control
- Provide flood storage and conveyance
- Reduce flood velocities
- Reduce flood peaks
- Reduce sedimentation
- Surface water quality maintenance
- Filter nutrients and impurities from runoff
- Process organic wastes
- Moderate temperatures of water
- Groundwater recharge
- Promote infiltration and aquifer recharge
- Reduce frequency and duration of low surface flows.
Areas within the floodplain that typically provide these natural functions are wetlands, riparian areas, sensitive areas, and habitats for rare and endangered species.

### 6.6.5 Economic Impact

Locations of flooding will undergo heaviest economic impact. Within these areas, renovations of commercial buildings may be necessary, disrupting associated services. Additionally, significant damage within agricultural areas may occur with destruction of crops and other agricultural products. The tourism industry may also be affected by major flood events, as popular vacation areas tend to overlap flood hazard zones. Finally, flooding can cause extensive damage to public utilities and disruptions to delivery of services. Loss of power and communications may occur; and drinking water and wastewater treatment facilities may be temporarily out of operation.

### 6.7 Future Trends in Development

As discussed under the County Profile, areas targeted for future growth and development have been identified across the County. Any areas of growth could be impacted by the flood hazard if located within the identified hazard areas. The County intends to discourage development within vulnerable areas and/or to encourage higher regulatory standards on the local level.

The County and its jurisdictions are equipped to handle future growth within flood hazard areas. All municipal planning partners have general plans that address frequently flooded areas in their safety elements. All partners have committed to link their general plans to this HMP. This will create an opportunity for wise land use decisions as future growth impacts flood hazard areas.

Additionally, all municipal planning partners are participants in the NFIP and have adopted flood damage prevention ordinances in response to its requirements. With 25 percent of communities in the County participating in the CRS program, there is incentive to adopt consistent, appropriate, higher regulatory standards in communities with the highest degree of flood risk. All municipal planning partners have committed to maintain their good standing under the NFIP through initiatives identified in this HMP. Communities participating or considering participation in the CRS program will be able to refine this commitment using CRS programs and templates as a guide.
<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Agriculture/Resource Extraction</th>
<th>Commercial</th>
<th>Education</th>
<th>Industrial</th>
<th>Mixed Use</th>
<th>Other/Water</th>
<th>Parks/Open Space</th>
<th>Residential</th>
<th>Total</th>
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<td></td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
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<td>0.54%</td>
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<td>3.40%</td>
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<td>128.5</td>
<td>0.16%</td>
<td>912.0</td>
<td>1.16%</td>
<td>257.9</td>
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</table>
6.8 Scenario

Historically, floods have regularly affected San Mateo County. The County can expect noteworthy flooding about once a year, with a flash flood approximately every 2 years. Duration and intensity of heavy winter rains and El Niño storms that cause flooding may increase due to climate change. The floodplains mapped and identified by San Mateo County will continue to take the brunt of these floods. County residents prepare themselves for flooding by seeking and receiving information, and by pursuing mitigation. Impacts of flood events should decrease as the County, local cities, and residents continue to promote and implement hazard mitigation and preparedness.

The worst-case scenario would be a series of heavy rains or storm events during an El Niño event or winter rainy season, particularly if the rains also occur at high tide. These rains could flood numerous areas within a short time. This could overwhelm the response and floodplain management capability within the planning area, as the planning area would be subject immediately to flash flooding and coastal flooding, with subsequent influences on the County’s streams. Major roads could be blocked, preventing critical access for many residents and critical functions. High in-channel flows could cause water courses to scour, possibly washing out roads and creating more isolation problems. In the event of multi-basin flooding, San Mateo County would not be able to make repairs quickly enough to restore critical facilities and assets.

6.9 Issues

The planning team has identified the following flood-related issues relevant to the planning area:

- Accuracy of existing flood hazard mapping by FEMA regarding true flood risk within the planning area is questionable. This is most prevalent within areas protected by levees not accredited by the FEMA mapping process.
- Extent of flood protection currently provided by flood control facilities (dams, dikes, and levees) is not known due to lack of established national policy on flood protection standards.
- The levee system within the planning area is not consistently adequate to mitigate effects of a 1-percent annual chance flood.
- Risk associated with the flood hazard overlaps risks associated with other hazards such as earthquakes, landslides, and coastal erosion. This provides opportunity to seek mitigation alternatives with multiple objectives that can reduce risks from multiple hazards.
- Land-use practices are not consistent with the scope of regulatory floodplain management within the planning area.
- How climate change will affect flood conditions in San Mateo County is uncertain.
- More information is needed regarding flood risk to support the concept of risk-based analysis of capital projects.
- To determine cost-effectiveness of future mitigation projects, sustained effort is necessary to gather damage reports and historical damage data such as high water marks on structures.
- Ongoing flood hazard mitigation will require funding from multiple sources.
A coordinated hazard mitigation effort is necessary among jurisdictions affected by flood hazards within the County.

Floodplain residents must continue to seek and receive information about flood preparedness and resources available during and after floods.

The concept of residual risk should be considered in design of future capital flood control projects, and should be communicated to residents living in the floodplain.

Promotion of flood insurance as a means of protecting private property owners from economic impacts of frequent flood events should continue.

Existing floodplain-compatible uses such as agricultural and open space must be maintained. Pressure is constant to convert these existing uses to more intense uses within the planning area during times of moderate to high growth.

The economy affects a jurisdiction’s ability to manage its floodplains. Budget cuts and personnel losses can strain resources needed to support floodplain management.
Chapter 7. Landslide

7.1 General Background

Landslides and mudslides can be initiated by storms, earthquakes, fires, volcanic eruptions, or human modification of the land. They can move rapidly down slopes or through channels and can strike with little or no warning at avalanche speeds.

According to the U.S. Geological Survey (USGS), the term “landslide” includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over-steepened slope is the primary reason for a landslide, there are other contributing factors (NJGWS 2013). Landslide hazard areas are areas where characteristics such as the following indicate a risk of downhill movement of material:

- A slope greater than 33 percent
- A history of landslide activity during the last 10,000 years
- Stream or wave activity that has caused erosion or cut into a bank to make the surrounding land unstable
- The presence or potential for snow avalanches
- The presence of an alluvial fan, which indicates vulnerability to the flow of debris or sediments
- The presence of impermeable soils, such as silt or clay, mixed with granular soils such as sand and gravel.

Scientists from the USGS also monitor stream flow, noting changes in sediment load in rivers and streams that may result from landslides. All of these types of landslides are considered aggregately in USGS landslide mapping.

Mudslides (or mudflows or debris flows) are rivers of rock, earth, organic matter, and other soil materials saturated with water. They develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil’s reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud. The material can travel miles from its source, growing as it descends, picking up trees, boulders, cars, and anything else in its path. Although these slides behave as fluids, they pack many times the hydraulic force of water because of the mass of material they encompass.

A debris avalanche (Figure 7-1) is a fast-moving debris flow that travels faster than about 10 miles per hour (mph). Speeds in excess of 20 mph are not uncommon, and speeds in excess of 100 mph, although rare, can occur. Debris avalanches are like mudslides in that they can travel many miles from their source, picking up
large objects in their path, and that they can have many times the hydraulic force of water because of the mass of material in them. They can be among the most destructive events in nature.

Several other types of landslides also exist. These include:

- **Rock Falls**: blocks of rock that fall away from a bedrock unit without a rotational component
- **Rock Topples**: blocks of rock that fall away from a bedrock unit with a rotational component
- **Rotational Slump**: blocks of fine grained sediment that rotate and move down slope
- **Transitional Slide**: sediments that move along a flat surface without a rotational component
- **Earth Flows**: fine-grained sediments that flow downhill and typically form a fan structure
- **Creep**: a slow-moving landslide, often noticed only through crooked trees and disturbed structures
- **Block Slides**: blocks of rock that slide along a slip plane as a unit down a slope.

Landslides can pose a serious hazard to properties on or below hillsides. When landslides occur — in response to such changes as increased water content, earthquake shaking, addition of load, or removal of downslope support — they deform and tilt the ground surface. The result can be destruction of foundations, offset of roads, breaking of underground pipes, or overriding of downslope property and structures.

![Figure 7-1. Typical Debris Avalanche Scar and Track](#)

### 7.1.1 Landslide Types and Run-Out

Two characteristics are essential to conducting an accurate risk assessment of the landslide hazard:

- The type of initial ground failure that occurs
- The post-failure movement of the loosened material (“run-out”), including travel distance and velocity.
Landslides are commonly categorized by the type of initial ground failure. Figure 7-2 through Figure 7-5 show common types of slides (Ecology 2014). The most common is the shallow colluvial slide, occurring particularly in response to intense, short-duration storms. The largest and most destructive are deep-seated slides, although they are less common than other types.

**Figure 7-2. Deep Seated Slide**

**Figure 7-3. Shallow Colluvial Slide**

**Figure 7-4. Bench Slide**

**Figure 7-5. Large Slide**

All current landslide models — those in practical applications and those more recently developed — use simplified hypothetical descriptions of mass movement to simulate the complex behavior of actual flow. The models attempt to reproduce the general features of the moving mass of material through measurable factors, such as base shear, that define a system and determine its behavior. Because of the lack of experimental data and the limited current knowledge about the behavior of the moving flows, landslide models use simplified parameters to account for complex aspects that may not be defined. These simplified parameters are not related to specific physical processes that can be directly measured, and there is a great deal of uncertainty in their definition. Some, but not all, models provide estimates of the level of uncertainty associated with the modeling approach.

Run-out modeling is complicated because the movement of materials may change over the course of a landslide event, depending on the initial composition, the extent of saturation by water, the ground shape of
the path traveled, and whether additional material is incorporated during the event (Savage and Hutter 1991; Rickenmann 2000; Iverson et al. 2004).

### 7.1.2 Landslide Causes

Mass movements are caused by a combination of geological and climate conditions, as well as the encroaching influence of urbanization. Vulnerable natural conditions are affected by human residential, agricultural, commercial, and industrial development and the infrastructure that supports it. The following factors can contribute to landslide: change in slope of the terrain, increased load on the land, shocks and vibrations, change in water content, groundwater movement, frost action, weathering of rocks, and removing or changing the type of vegetation covering slopes.

**Excavation and Grading**

Slope excavation is common in development of home sites or roads on sloping terrain. Grading can result in some slopes that are steeper than the pre-existing natural slopes. Since slope steepness is a major factor in landslides, these steeper slopes can be at an increased risk for landslides. The added weight of fill on slopes can also result in an increased landslide hazard. Small landslides can be fairly common along roads, in either the road cut or the road fill. Landslides below new construction sites are indicators of the potential impacts stemming from excavation.

**Drainage and Groundwater Alterations**

Water flowing through or above ground is often the trigger for landslides. Any activity that augments the amount of water flowing into landslide-prone slopes can increase landslide hazards. Broken or leaking water or sewer lines can be especially problematic, as can water retention facilities that direct water onto slopes. However, even lawn irrigation and minor alterations to small streams in landslide-prone locations can result in damaging landslides. Ineffective stormwater management and excess runoff can also cause erosion and increase the risk of landslide hazards. Drainage can be affected naturally by the geology and topography of an area. Development that results in an increase in impervious surface impairs the ability of the land to absorb water and may redirect water to other areas. Channels, streams, flooding, and erosion on slopes all indicate potential slope problems.

Road and driveway drains, gutters, downspouts, and other constructed drainage facilities can concentrate and accelerate flow. Ground saturation and concentrated velocity flow are major causes of slope problems and may trigger landslides.

**Changes in Vegetation**

Removing vegetation from very steep slopes can increase landslide hazards. A study by the Oregon Department of Forestry found that landslide hazards in three out of four steeply sloped areas were highest for a period of roughly 10 years after timber harvesting (Oregon Department of Forestry 1999). Areas that have experienced wildfire and land clearing for development may experience long periods of increased landslide hazard. In addition, woody debris in stream channels (both natural and man-made from logging) may cause the impacts from debris flows to be more severe.
7.1.3 Landslide Management

While small landslides are frequently a result of human activity, the largest landslides are often naturally occurring phenomena with little or no human contribution. The sites of large landslides are typically areas of previous landslide movement that are periodically reactivated by significant precipitation or seismic events. These naturally occurring landslides can disrupt roadways and other infrastructure lifelines, destroy private property, and cause flooding, bank erosion, and rapid channel migration.

Landslides can create immediate, critical threats to public safety. Engineering solutions to protect structures on or adjacent to large active landslides are often extremely or prohibitively expensive.

In spite of their destructive potential, landslides can serve beneficial functions to the natural environment. They supply sediment and large wood to the channel network and can contribute to complexity and dynamic channel behavior critical for aquatic and riparian ecological diversity. Effective landslide management should include the following elements:

- Continuing investigation to identify natural landslides, understand their mechanics, assess their risk to public health and welfare, and understand their role in ecological systems
- Regulation of development in or near existing landslides or areas of natural instability through the San Mateo County Code and City ordinances.
- Preparation for emergency response to landslides to facilitate rapid, coordinated action among San Mateo County, local cities, and state and federal agencies, and to provide emergency assistance to affected or at-risk citizens
- Evaluation of options including landslide stabilization or structure relocation where landslides are identified that threaten critical public structures or infrastructure

7.2 Hazard Profile

7.2.1 Past Events

Landslides have occurred regularly within San Mateo County; one such event led to the deaths of three children in 1982, and several events (conjointly with coastal erosion) have required apartment evacuations along coastal bluffs. The table below lists known landslide events that have affected San Mateo County between 1980 and 2016. Two other landslides (outside of San Mateo County) were also recorded by the USGS in its “Did you see it?” archives. One occurred in 2012 and the other in 1970; both were about an hour’s drive from the County but still near the Bay Area.
### Table 7-1. Landslide Events in San Mateo County

<table>
<thead>
<tr>
<th>Dates of Event</th>
<th>Event Type</th>
<th>FEMA Declaration Number</th>
<th>Location</th>
<th>Losses/Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Various</td>
<td>Debris Flows</td>
<td>N/A</td>
<td>Tunitas Creek, San Gregorio, and Pescadero watersheds; Alpine Road, Crystal Springs, San Bruno Mountain, and Point San Pedro; Coastal sea cliffs</td>
<td>Damage from debris flows has particularly been incurred the southwestern portion of the County, including the Tunitas Creek, San Gregorio, and Pescadero watersheds. Debris flows are widespread on the natural slopes west of Skyline Ridge; they are present but rare on natural slopes east of Skyline Ridge; and they have been observed in Alpine Road, Crystal Springs, San Bruno Mountain, and Point San Pedro, as well as the County’s coastal sea cliffs.</td>
</tr>
<tr>
<td>January 4, 1982</td>
<td>Landslides, Severe Storm</td>
<td>N/A</td>
<td>San Mateo County (Pacifica and Various)</td>
<td>Hundreds of small to major landslides resulted from an intense storm saturating the County. Many of the landslides occurred in steep sections of the western and northern portions of the County, mostly in areas of low population density. In Pacifica, three children died after a strip of hillside behind their homes slid hundreds of feet and destroyed two homes. The County recorded millions of dollars in property damage from the landslides.</td>
</tr>
<tr>
<td>1995</td>
<td>Landslide</td>
<td>N/A</td>
<td>Highway 1 by Devils Slide</td>
<td>Highway 1 has been closed by landslides multiple times at Devils Slide. In 1995 and 2006, landslides led to extended closures. The new Tom Lantos Tunnel, opened in March 2013, allows the highway to bypass Devils Slide and reduce vulnerability.</td>
</tr>
<tr>
<td>February 1995</td>
<td>Late Winter Storms (Severe Winter Storms, Flood, Landslide, Mudflows)</td>
<td>1046-DR-CA</td>
<td>San Mateo County</td>
<td>All 57 counties excepting Del Norte were included in this declaration, where more than 100 stations recorded their greatest ever 1-day rainfall total. In total, the state recorded 17 deaths; $190.6 million in public property damages, $122.4 million in individual damages, $46.9 million in business damages, $79 million in highway damages, and $651.6 million in agricultural damages; and significant damage to homes, with 1,322 recording major damage, 267 listed as destroyed, and 2,299 recording minor damage.</td>
</tr>
</tbody>
</table>
## Table 7-1. Landslide Events in San Mateo County

<table>
<thead>
<tr>
<th>Dates of Event</th>
<th>Event Type</th>
<th>FEMA Declaration Number</th>
<th>Location</th>
<th>Losses/Impacts</th>
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</thead>
<tbody>
<tr>
<td>February 1998</td>
<td>Landslides</td>
<td>N/A</td>
<td>San Mateo County</td>
<td>These landslides are most likely associated with the El Niño damages described in more detail immediately below. The main slide in La Honda began moving continuously since at least February 11, and movement accelerated after a period of rain. Three houses at the head of the slide were red tagged, as were five other houses on or adjacent to it. San Mateo County drilled three wells in a road crossing the slide and began pumping wells on February 26. The County also dug plastic-lined trenches to facilitate drainage. Residents of seven homes on Esplanade Drive in Pacifica evacuated on February 22 after landslides and cliff erosion. The 30-foot cliff had retreated 10 feet to the rear edge of the homes in a 2-week period. Eventually cliff erosion, soil fall, and rock falls slowed; however, water continued seeping from the face. Plans began for sea wall and other mitigation measures.</td>
</tr>
<tr>
<td>February 2, 1998</td>
<td>El Niño (Flood and Landslides)</td>
<td>DR-1203</td>
<td>San Mateo County (Various Cities)</td>
<td>More than 11,000 people were evacuated because of 80 mph winds and floods. Record flooding was declared in San Mateo and Santa Clara Counties. Severe and widespread landslides in San Mateo County, four other counties, and 13 cities were triggered by intense rain all winter. In total, the region recorded 17 deaths and damage estimates of $550 million. San Mateo County recorded a minimum of $55 million in damages to public and private properties from landslides resulting from the 1998 winter storms. La Honda, Moss Beach, Pacifica, Daly City, and Portola Valley listed $38 million in damages. Hundreds of hillside slope failures occurred, particularly during the week of February 2. The most common types of damaging failures were earthflows and earth slumps, and the pre-existing Polhemus landslide (earth slump) reactivated. Shoreline retreat in Daly City, Pacifica, Tunitas Creek, and Moss Beach were included in this assessment.</td>
</tr>
</tbody>
</table>
**Table 7-1. Landslide Events in San Mateo County**

<table>
<thead>
<tr>
<th>Dates of Event</th>
<th>Event Type</th>
<th>FEMA Declaration Number</th>
<th>Location</th>
<th>Losses/Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 17, 2005 – January 12, 2006</td>
<td>Winter Storms (Severe Storms, Flood, Mudslides, Landslides)</td>
<td>DR-1628</td>
<td>San Mateo County</td>
<td>Damage estimates for the region exceeded $100 million. Storms were blamed for two deaths from falling trees, around 50 businesses declared damaged, and three homes were nearly wiped out by mudslides. Event included severe storms, flooding, mudslides, and landslides.</td>
</tr>
<tr>
<td>March 29 – April 1, 2006</td>
<td>Spring Storms (Severe Storms, Flood, Landslides, Mudslides)</td>
<td>DR-1646</td>
<td>San Mateo County</td>
<td>Damages not available.</td>
</tr>
<tr>
<td>April 1, 2006</td>
<td>Debris Flow</td>
<td>N/A</td>
<td>San Francisco Peninsula Coast</td>
<td>Well above normal and persistent rainfall caused several mudslides across the area through the month of April. The hardest hit areas were water-soaked hillsides in Brisbane, Broadmoor, and El Granada. In total, 83 damage sites were documented throughout San Mateo County. One slide caused Highway 1 at Devil’s Slide to be closed for an estimated period of several months.</td>
</tr>
<tr>
<td>April 4, 2006</td>
<td>Debris Flow</td>
<td>N/A</td>
<td>Santa Cruz Mountains (Zone)</td>
<td>Heavy and persistent rains in the Santa Cruz mountains during the first half of April caused many landslides. Damage was estimated at nearly $13 million, with at least $6 million charged to county road damages.</td>
</tr>
<tr>
<td>April 22, 2006</td>
<td>Landslide</td>
<td>N/A</td>
<td>Half Moon Bay</td>
<td>Landslide downed fiber optic phone lines on Saturday evening, leading to phone services outages in several San Mateo County coastal cities. The landslide occurred in a coastal mountainous area near state Highway 92 in an area not accessible by vehicle.</td>
</tr>
<tr>
<td>December 2009</td>
<td>Coastal Erosion (with associated landslides)</td>
<td>N/A</td>
<td>Pacifica</td>
<td>A breakaway bluff significantly eroded, forcing evacuations in several apartments on Esplanade Avenue. The evacuation order was triggered by a 30-foot land mass falling from the cliff.</td>
</tr>
<tr>
<td>December 6, 2014</td>
<td>Landslide</td>
<td>N/A</td>
<td>CA-84 East, between Old La Honda Rd., and Highway 35/Skyline Blvd.</td>
<td>A landslide led to a traffic alert for motorists on CA-84 East, where only one lane was open for traffic. Motorists were advised to expect delays and to avoid the area, if possible.</td>
</tr>
</tbody>
</table>
## Table 7-1. Landslide Events in San Mateo County

<table>
<thead>
<tr>
<th>Dates of Event</th>
<th>Event Type</th>
<th>FEMA Declaration Number</th>
<th>Location</th>
<th>Losses/Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>January/February 2016</td>
<td>Coastal Erosion (with associated landslides and sinkholes)</td>
<td>N/A</td>
<td>Pacifica</td>
<td>Residents with apartments along coastal bluffs have been forced to evacuate after significant erosion has led to dangers of building collapse. Further south, Beach Boulevard has suffered notable infrastructure damage from erosion.</td>
</tr>
</tbody>
</table>


Note: For more information on the impacts of coastal erosion, refer to the Flood Hazard Profile. Coastal erosion events have been included here based on the speed and magnitude of the occurrences, and the possibility of joint landslide incidents.
7.2.2 Location

The entire U.S. experiences landslides, with 36 states having moderate to highly severe landslide hazards. Expansion of urban and recreational developments into hillside areas exposes more people to the threat of landslides each year. According to the USGS, San Mateo County has a high to very high landslide potential. For a figure displaying the landslide potential of the conterminous United States, please refer to http://pubs.usgs.gov/fs/2005/3156/2005-3156.pdf (USGS 2005).

The California Landslide Hazard Identification Act directs the State Geologist to identify and map hazardous landslide areas for use by municipalities in planning and decision-making on grading and building permits. Three factors that characterize landslide hazard areas include significant slope, weak rocks, and heavy rains. This program focuses on urban areas and growth areas that exhibit these characteristics. Although the California Geological Survey (CGS) provides access to many of these maps through its California Landslide Inventory, it does not offer them at the County level for San Mateo County (CGS 2016).

The Association of Bay Area Governments (ABAG) Resilience Program provides more detailed mapping for the Bay Area through use of USGS Summary of Distribution of Slides and Earth Flows (1997) and Map Showing Principal Debris-Flow Source Areas (1997). The County of San Mateo overlayed these data with its jurisdictional boundaries to develop Figure 7-1 below. Based on these data, the majority of the County is vulnerable to some type of landsliding, with the southern half of the County having a higher rate of landslides (San Mateo County 2016). The County also notes that more than 92 percent of the areas vulnerable to landslides are located within unincorporated areas; 7.53 percent of acres vulnerable to landslides are in incorporated areas of the County (San Mateo Sheriff 2015).

Landslide hazard areas and steep slopes within the planning area are shown on Figure 7-6. The landslide areas presented are provided by ABAG.
FIGURE 7-6. LANDSLIDE HAZARD AREAS
7.2.3 Frequency

Landslides are often triggered by other natural hazards such as earthquakes, heavy rain, floods (and associated coastal erosion), or wildfires, so the frequency of landslides is related to the frequency of these other hazards. In San Mateo County, landslides are most likely to occur during and after major storms.

Based on risk factors for the County and past occurrences, it is highly likely that landslides will continue to occur in San Mateo County. Landslide probabilities are largely a function of surface geology, but are also influenced by both weather and human activities.

7.2.4 Severity

Landslides destroy property and infrastructure and can take the lives of people. Slope failures in the United States result in an average of 25 lives lost per year and an annual cost of about $1.5 billion. Landslides can also create travel delays and other side effects.

The affected areas need to be identified and the probability that the landslide will occur within some time period needs to be evaluated to assess the magnitude or extent of a landslide hazard. Natural variables that contribute to the overall extent of potential landslide activity in any particular area include soil properties, topographic position and slope, and historical incidence. Predicting a landslide is difficult, even under ideal conditions and with reliable information. As a result, the landslide hazard is often represented by landslide incidence or susceptibility, as defined below:

- Landslide incidence is the number of landslides that have occurred in a given geographic area. High incidence means greater than 15 percent of a given area has been involved in landsliding; medium incidence means that 1.5 to 15 percent of an area has been involved; and low incidence means that less than 1.5 percent of an area has been involved (State of Alabama Date Unknown).
- Landslide susceptibility is defined as the probable degree of response of geologic formations to natural or artificial cutting, to loading of slopes, or to unusually high precipitation. It can be assumed that unusually high precipitation or changes in existing conditions can initiate landslide movement in areas where rocks and soils have experienced numerous landslides in the past. Landslide susceptibility depends on slope angle and the geologic material underlying the slope. Landslide susceptibility identifies only areas potentially affected and does not imply a time frame when a landslide might occur. High, medium, and low susceptibility are delimited by the same percentages used for classifying the incidence of landsliding (State of Alabama Date Unknown).

7.2.5 Warning Time

Mass movements can occur suddenly or slowly. The velocity of movement may range from a slow creep of inches per year to many feet per second, depending on slope angle, material, and water content. Generally accepted warning signs for landslide activity include the following:

- Springs, seeps, or saturated ground in areas that have not typically been wet before
- New cracks or unusual bulges in the ground, street pavements, or sidewalks
Landslide

- Soil moving away from foundations
- Ancillary structures such as decks and patios tilting or moving relative to the main house
- Tilting or cracking of concrete floors and foundations
- Broken water lines and other underground utilities
- Leaning telephone poles, trees, retaining walls or fences
- Offset fence lines
- Sunken or down-dropped road beds
- Rapid increase in creek water levels, possibly accompanied by increased turbidity (soil content)
- Sudden decrease in creek water levels though rain is still falling or just recently stopped
- Sticking doors and windows and visible open spaces indicating frames out of plumb
- A faint rumbling sound that increases in volume as the landslide nears
- Unusual sounds, such as trees cracking or boulders knocking together.

Some methods used to monitor mass movements can provide an idea of the type of movement and the amount of time prior to failure. Assessing the geology, vegetation, and amount of predicted precipitation for an area can help in predictions of what areas are at risk during general time periods. Currently, there is no practical warning system for individual landslides, however. The standard operating procedure is to monitor situations on a case-by-case basis and respond after an event has occurred.

7.3 Secondary Hazards

Landslides can cause several types of secondary effects, such as blocking access to roads, which can isolate residents and businesses and delay emergency response or commercial, public, and private transportation. This blocked access could result in economic losses for businesses. Other potential problems resulting from landslides are power and communication failures. Utility poles on slopes can be knocked over, resulting in losses to power and communication lines. Landslides also have the potential to destabilize the foundation of structures, which may result in monetary loss for residents. They also can damage rivers or streams, potentially harming water quality, fisheries, and spawning habitat.

7.4 Exposure

7.4.1 Population

Population could not be examined by landslide hazard area because census block group areas do not coincide with the hazard areas. Population was estimated using the structure count of buildings within the landslide hazard areas and multiplying the estimated population for each jurisdiction by the percent of the residential structures in the jurisdiction exposed to the landslide hazard. Using this approach, the estimated population living in the landslide risk area is 20,570 or 2.7 percent of the total planning area population. This estimate includes only populations within defined landslide risk areas; it does not include persons who may be affected by landslide runout. Table 7-2 shows the estimated population exposure by city.
TABLE 7-2. ESTIMATED POPULATION RESIDING IN LANDSLIDE RISK AREAS

<table>
<thead>
<tr>
<th>Location</th>
<th>Population Exposed</th>
<th>% of Total Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Belmont</td>
<td>868</td>
<td>3.2%</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Burlingame</td>
<td>1,046</td>
<td>3.5%</td>
</tr>
<tr>
<td>Colma</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daly City</td>
<td>4,742</td>
<td>4.5%</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Foster City</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>106</td>
<td>0.9%</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Millbrae</td>
<td>1,739</td>
<td>7.6%</td>
</tr>
<tr>
<td>Pacifica</td>
<td>922</td>
<td>2.4%</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>791</td>
<td>17.5%</td>
</tr>
<tr>
<td>Redwood City</td>
<td>177</td>
<td>0.2%</td>
</tr>
<tr>
<td>San Bruno</td>
<td>81</td>
<td>0.2%</td>
</tr>
<tr>
<td>San Carlos</td>
<td>163</td>
<td>0.6%</td>
</tr>
<tr>
<td>San Mateo</td>
<td>1,462</td>
<td>1.4%</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>3,323</td>
<td>5.0%</td>
</tr>
<tr>
<td>Woodside</td>
<td>514</td>
<td>9.3%</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>4,637</td>
<td>7.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20,570</strong></td>
<td><strong>2.7%</strong></td>
</tr>
</tbody>
</table>

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

7.4.2 Property

Table 7-3 shows the number and replacement value of structures exposed to the landslide risk. Table 7-4 shows the types of structures in landslide hazard areas. There are an estimated 5,652 structures located in the landslide risk areas, with an estimated value of $5.69 billion. This number represents 1.8 percent of the total replacement value for the planning area. More than 95 percent of the exposed structures are estimated to be residential. Table 7-5 shows the general land use of parcels exposed to landslides in San Mateo County.

TABLE 7-3. EXPOSURE AND VALUE OF STRUCTURES IN LANDSLIDE RISK AREAS

<table>
<thead>
<tr>
<th>Location</th>
<th>Buildings Exposed</th>
<th>Value Exposed</th>
<th>% of Total Replacement Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Structure</td>
<td>Contents</td>
</tr>
<tr>
<td>Atherton</td>
<td>0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Belmont</td>
<td>246</td>
<td>$128,514,301</td>
<td>$91,688,832</td>
</tr>
<tr>
<td>Brisbane</td>
<td>1</td>
<td>$263,145</td>
<td>$394,718</td>
</tr>
<tr>
<td>Burlingame</td>
<td>274</td>
<td>$112,569,905</td>
<td>$66,851,882</td>
</tr>
</tbody>
</table>
### Table 7-3. Exposure and Value of Structures in Landslide Risk Areas

<table>
<thead>
<tr>
<th>Location</th>
<th>Buildings Exposed</th>
<th>Structure</th>
<th>Contents</th>
<th>Total</th>
<th>% of Total Replacement Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colma</td>
<td>0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daly City</td>
<td>1,029</td>
<td>$331,386,628</td>
<td>$218,376,516</td>
<td>$529,763,144</td>
<td>2.1%</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Foster City</td>
<td>0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>1</td>
<td>$4,044,240</td>
<td>$4,044,240</td>
<td>$8,088,480</td>
<td>0.1%</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>36</td>
<td>$18,627,015</td>
<td>$9,313,508</td>
<td>$27,940,523</td>
<td>0.6%</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Millbrae</td>
<td>496</td>
<td>$176,554,277</td>
<td>$97,619,450</td>
<td>$274,173,727</td>
<td>2.8%</td>
</tr>
<tr>
<td>Pacifica</td>
<td>284</td>
<td>$104,425,677</td>
<td>$75,092,863</td>
<td>$179,518,540</td>
<td>1.6%</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>273</td>
<td>$176,362,023</td>
<td>$126,643,111</td>
<td>$303,005,134</td>
<td>11.1%</td>
</tr>
<tr>
<td>Redwood City</td>
<td>42</td>
<td>$34,471,736</td>
<td>$25,899,988</td>
<td>$60,371,723</td>
<td>0.2%</td>
</tr>
<tr>
<td>San Bruno</td>
<td>22</td>
<td>$5,916,554</td>
<td>$2,958,277</td>
<td>$8,874,832</td>
<td>0.1%</td>
</tr>
<tr>
<td>San Carlos</td>
<td>55</td>
<td>$15,886,974</td>
<td>$7,943,487</td>
<td>$23,830,460</td>
<td>0.1%</td>
</tr>
<tr>
<td>San Mateo</td>
<td>390</td>
<td>$154,245,073</td>
<td>$95,259,137</td>
<td>$249,504,210</td>
<td>0.6%</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>824</td>
<td>$311,300,934</td>
<td>$199,042,380</td>
<td>$510,343,314</td>
<td>1.6%</td>
</tr>
<tr>
<td>Woodside</td>
<td>186</td>
<td>$106,567,081</td>
<td>$71,289,972</td>
<td>$177,857,053</td>
<td>6.1%</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>1,493</td>
<td>$1,559,578,176</td>
<td>$1,375,305,107</td>
<td>$2,934,883,283</td>
<td>9.1%</td>
</tr>
<tr>
<td>Total</td>
<td>5,652</td>
<td>$3,220,713,739</td>
<td>$2,467,723,468</td>
<td>$5,688,437,206</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

### Table 7-4. Present Land Use in Landslide Hazard Areas

<table>
<thead>
<tr>
<th>Location</th>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Agriculture</th>
<th>Religion</th>
<th>Government</th>
<th>Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Belmont</td>
<td>241</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>246</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Burlingame</td>
<td>272</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>273</td>
</tr>
<tr>
<td>Colma</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Daly City</td>
<td>1,019</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1,029</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Foster City</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>36</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>36</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Millbrae</td>
<td>494</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>496</td>
</tr>
<tr>
<td>Pacifica</td>
<td>281</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>284</td>
</tr>
</tbody>
</table>

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**SECTION 2 - Chapter 7**

Landslide
7.4.3 Critical Facilities and Infrastructure

Facilities

Table 7-5 summarizes the critical facilities exposed to the landslide hazard. 45 of the planning area’s critical facilities are located within mapped landslide risk areas.

<p>| Table 7-4. Present Land Use in Landslide Hazard Areas |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|</p>
<table>
<thead>
<tr>
<th>Number of Structures in Landslide Hazard Areas</th>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Agriculture</th>
<th>Religion</th>
<th>Government</th>
<th>Education</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portola Valley</td>
<td>267</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>273</td>
</tr>
<tr>
<td>Redwood City</td>
<td>41</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>42</td>
</tr>
<tr>
<td>San Bruno</td>
<td>22</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>22</td>
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<td>0</td>
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<td><strong>131</strong></td>
<td><strong>8</strong></td>
<td><strong>3</strong></td>
<td><strong>5</strong></td>
<td><strong>5,651</strong></td>
</tr>
</tbody>
</table>

| Table 7-5. Critical Facilities in Landslide Hazard Areas in San Mateo County |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Medical and Health Services     | Emergency Services | Government | Utilities | Transportation Infrastructure | Hazardous Materials | Community Economic Facilities | Other Assets | Total |
| Atherton                        | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| Belmont                         | 0           | 0           | 0           | 2           | 0           | 0           | 0           | 2     |
| Brisbane                        | 0           | 0           | 0           | 0           | 1           | 0           | 0           | 1     |
| Burlingame                      | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| Colma                           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| Daly City                       | 0           | 0           | 0           | 0           | 0           | 1           | 0           | 1     |
| East Palo Alto                  | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| Foster City                     | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| Half Moon Bay                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| Hillsborough                    | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| Menlo Park                      | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| Millbrae                        | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| Pacifica                        | 0           | 0           | 0           | 2           | 1           | 0           | 0           | 4     |
| Portola Valley                  | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
| Redwood City                    | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0     |
## Table 7-5. Critical Facilities in Landslide Hazard Areas in San Mateo County

<table>
<thead>
<tr>
<th></th>
<th>Medical and Health Services</th>
<th>Emergency Services</th>
<th>Government</th>
<th>Utilities</th>
<th>Transportation Infrastructure</th>
<th>Hazardous Materials</th>
<th>Community Economic Facilities</th>
<th>Other Assets</th>
<th>Total</th>
</tr>
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<tbody>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
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<td>0</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>3</td>
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<td>3</td>
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<td>0</td>
<td>3</td>
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<td><strong>Total</strong></td>
<td><strong>0</strong></td>
<td><strong>1</strong></td>
<td><strong>0</strong></td>
<td><strong>13</strong></td>
<td><strong>26</strong></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
<td><strong>5</strong></td>
<td><strong>45</strong></td>
</tr>
</tbody>
</table>

### Roads and Bridges

A significant amount of infrastructure (roads, bridges, and utilities) can be exposed to mass movements. Access to major roads is crucial to life-safety after a disaster and can help to provide resilience during response and recovery operations. Landslides have the potential to block roads, isolating all or part of the County. Roadway blockages caused by landslides can create traffic problems, resulting in delays for emergency vehicles and public and private transportation. These blockages could result in economic losses for businesses. The following major roads intersect mapped landslide hazard areas:

- State Highway 1
- State Highway 92
- Interstate 380
- State Highway 84
- State Highway 82
- US Highway 101
- Interstate 280

Landslide events can significantly damage bridges. They can knock out bridge abutments or significantly weaken the soil supporting a bridge, obstructing the bridge or making it hazardous for use. Bridges in areas of high landslide risk often provide the only ingress and egress to large areas and in some cases to isolated areas. There are 26 bridges within San Mateo County that are believed to be exposed to the landslide hazard. Additionally, bridges outside the County could close off vital access routes. Facilities outside of the County have not been inventoried for this assessment.

### Power Lines

Other potential problems resulting from landslides are power and communication failures creating problems for vulnerable populations or businesses and potential loss of life in emergencies. Power lines are generally elevated above steep slopes, but the towers supporting them can be subject to landslides. A landslide could
cause the soil underneath a tower to fail, causing it to collapse, and ripping down the lines. An inventory of these types of facilities was not available for this assessment.

### 7.4.4 Environment

Landslides that fall into streams may significantly damage fish and wildlife habitat, as well as affecting water quality. Hillsides that provide wildlife habitat can be lost for prolonged periods through landslides. Topography may shift and sediment accumulation downslope can block waterways and roadways, impairing the quality of streams and other water bodies. However, landslides also provide resources for many ecosystems.

### 7.5 Vulnerability

#### 7.5.1 Population

Because of the nature of census block group data, it is difficult to estimate populations vulnerable to landslides. In general, all of the estimated 20,570 persons exposed to the landslide hazard are considered vulnerable. Increasing population, and the fact that many homes are built on view property atop or below bluffs and on steep slopes subject to mass movement, increases the number of lives endangered by this hazard. In addition, people may be affected if transportation corridors are disrupted by the landslide hazard.

#### 7.5.2 Property

Loss estimates for the landslide hazard are not based on modeling using damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing 10 percent, 30 percent, and 50 percent of the total replacement value of exposed structures. This approach allows emergency managers to evaluate a range of potential economic impacts based on an estimate of the percent of damage to the building stock. Damage in excess of 50 percent is considered substantial by most building codes and typically requires total reconstruction of the structure. Table 7-6 lists loss estimates to the general building stock in landslide hazard areas. It is highly unlikely that all landslide-prone areas would slide at the same time.

<table>
<thead>
<tr>
<th>Location</th>
<th>Exposed Value</th>
<th>10% Damage</th>
<th>30% Damage</th>
<th>50% Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Belmont</td>
<td>$220,203,133</td>
<td>$22,020,313</td>
<td>$66,060,940</td>
<td>$110,101,567</td>
</tr>
<tr>
<td>Brisbane</td>
<td>$657,863</td>
<td>$65,786</td>
<td>$197,359</td>
<td>$328,932</td>
</tr>
<tr>
<td>Burlingame</td>
<td>$179,421,787</td>
<td>$17,942,179</td>
<td>$53,826,536</td>
<td>$89,710,894</td>
</tr>
<tr>
<td>Colma</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Daly City</td>
<td>$529,763,144</td>
<td>$52,976,314</td>
<td>$158,928,943</td>
<td>$264,881,572</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Foster City</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>$8,088,480</td>
<td>$808,848</td>
<td>$2,426,544</td>
<td>$4,044,240</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>$27,940,523</td>
<td>$2,794,052</td>
<td>$8,382,157</td>
<td>$13,970,261</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
</tbody>
</table>
### Table 7-6. Loss Potential for Landslide

<table>
<thead>
<tr>
<th>Location</th>
<th>Exposed Value</th>
<th>10% Damage</th>
<th>30% Damage</th>
<th>50% Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millbrae</td>
<td>$274,173,727</td>
<td>$27,417,373</td>
<td>$82,252,118</td>
<td>$137,086,863</td>
</tr>
<tr>
<td>Pacifica</td>
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<td>$17,951,854</td>
<td>$53,855,562</td>
<td>$89,759,270</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>$303,005,134</td>
<td>$30,300,513</td>
<td>$90,901,540</td>
<td>$151,502,567</td>
</tr>
<tr>
<td>Redwood City</td>
<td>$60,371,723</td>
<td>$6,037,172</td>
<td>$18,111,517</td>
<td>$30,185,862</td>
</tr>
<tr>
<td>San Bruno</td>
<td>$8,874,832</td>
<td>$887,483</td>
<td>$2,662,450</td>
<td>$4,437,416</td>
</tr>
<tr>
<td>San Carlos</td>
<td>$23,830,460</td>
<td>$2,383,046</td>
<td>$7,149,138</td>
<td>$11,915,230</td>
</tr>
<tr>
<td>San Mateo</td>
<td>$249,504,210</td>
<td>$24,950,421</td>
<td>$74,851,263</td>
<td>$124,752,105</td>
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<tr>
<td>South San Francisco</td>
<td>$510,343,314</td>
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<td>$153,102,994</td>
<td>$255,171,657</td>
</tr>
<tr>
<td>Woodside</td>
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<td><strong>Total</strong></td>
<td><strong>$5,688,437,206</strong></td>
<td><strong>$568,843,718</strong></td>
<td><strong>$1,706,531,162</strong></td>
<td><strong>$2,844,218,605</strong></td>
</tr>
</tbody>
</table>

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

### 7.5.3 Critical Facilities and Infrastructure

There are 45 critical facilities exposed to the landslide hazard to some degree. A more in-depth analysis of mitigation measures taken by these facilities should be completed to evaluate whether they could withstand impacts of a mass movement. No loss estimates were developed as a result of the lack of established damage functions for the landslide hazard.

### 7.5.4 Environment

The environment vulnerable to landslide hazard is the same as the environment exposed to the hazard. A landslide alters the landscape. In addition to changes in topography, vegetation and wildlife habitats may be damaged or destroyed, and soil and sediment runoff will accumulate downslope, potentially blocking waterways and roadways and impairing the quality of streams and other water bodies.

### 7.5.5 Economic Impact

The economic impact of a landslide or similar geologic event depends on the severity and location of the landslide. Minor landslides may not lead to any economic impact if they occur in the woods or in non-populated areas. Minor landslides in more populated areas can have a hidden economic impact, however. Landslides that lead to temporary road closures isolate neighborhoods and delay traffic for public and private transportation. This delay can result in losses for businesses if employees are unable to make it to work or if customers choose not to shop at a store because of logistical difficulties.

Landslide economic losses can ultimately be categorized in several ways. Direct impacts include the costs of replacement, repair, rebuilding, and maintenance resulting from landslide damage to property. Indirect costs include reduced real estate values in areas threatened by landslides; loss of tax revenues on properties devalued by landslides; loss of industrial, agricultural, and forest productivity, and of tourist revenues; loss of...
human or domestic animal productivity because of death, injury, and psychological trauma; and costs of mitigation and prevention to reduce landslide risks. Economic impact can also be evaluated by private and public costs. Private costs are mainly incurred as damage to land and structures, such as private property or industrial facilities. Public costs are those borne by government agencies. The largest public cost is the repair or relocation of highways/roads and accessory structures (sidewalks and storm drains) after an event (USGS 2001).

The potential for greater economic impact as a result of landslides is growing; it results when the built environment expands into unstable hillside areas to accommodate growing populations. Human activities and development exacerbate already unstable areas, increasing the potential for slope failures (USGS 2001).

7.6 Future Trends in Development

The County and its planning partners are equipped to handle future growth within landslide hazard areas, although the large range of landslide hazard areas in the County make vigilance toward growth and development even more important.

Additionally, the State of California has adopted the International Building Code (IBC) by reference in its California Building Standards Code. The IBC includes provisions for geotechnical analyses in steep slope areas that have soil types considered susceptible to landslide hazards. These provisions assure that new construction is built to standards that reduce the vulnerability to landslide risk.
## Table 7-7. Future Land Use Exposure to the Landslide Hazard

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Agriculture/Resource Extraction</th>
<th>Commercial</th>
<th>Education</th>
<th>Industrial</th>
<th>Mixed Use</th>
<th>Other/Unknown</th>
<th>Parks/Open Space</th>
<th>Residential</th>
<th>Water</th>
<th>Total</th>
</tr>
</thead>
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<tr>
<td></td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
</tr>
<tr>
<td>Atherton</td>
<td>0</td>
<td>0.00%</td>
<td>0</td>
<td>0.00%</td>
<td>0</td>
<td>0.00%</td>
<td>0</td>
<td>0.00%</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Belmont</td>
<td>0.0</td>
<td>0.00%</td>
<td>1.5</td>
<td>1.90%</td>
<td>0.0</td>
<td>0.00%</td>
<td>61.7</td>
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<td>0.7</td>
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<td>0.00%</td>
<td>20.7</td>
<td>17.77%</td>
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<td>0.00%</td>
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<td>0.00%</td>
<td>0</td>
<td>0.00%</td>
</tr>
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<td>0.00%</td>
<td>0</td>
<td>0.00%</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Half Moon Bay</td>
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<td>0.0</td>
<td>0.00%</td>
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<td>0.00%</td>
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<td>0.00%</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
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<td>0.00%</td>
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<td>0.00%</td>
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<td>10.07%</td>
</tr>
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<td>0.00%</td>
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<td>0.00%</td>
<td>132.9</td>
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<td>3.94%</td>
</tr>
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<td>0.0</td>
<td>0.00%</td>
<td>35.7</td>
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<td>0.00%</td>
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<td>0.00%</td>
<td>1.8</td>
<td>3.97%</td>
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<td>87.79%</td>
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<tr>
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<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.3</td>
<td>1.92%</td>
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<td>2.3</td>
<td>1.24%</td>
<td>100.4</td>
<td>53.87%</td>
</tr>
<tr>
<td>South San Francisco</td>
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<td>2.5</td>
<td>1.70%</td>
<td>0.0</td>
<td>0.00%</td>
<td>5.5</td>
<td>3.76%</td>
<td>28.7</td>
<td>19.81%</td>
</tr>
<tr>
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<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>37.7</td>
<td>3.57%</td>
<td>995.6</td>
<td>94.38%</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>30,634.9</td>
<td>49.98%</td>
<td>14.9</td>
<td>0.02%</td>
<td>96.0</td>
<td>0.16%</td>
<td>273.8</td>
<td>0.45%</td>
<td>29,444.7</td>
<td>48.04%</td>
</tr>
<tr>
<td>Total</td>
<td>30,634.9</td>
<td>46.29%</td>
<td>56.2</td>
<td>0.08%</td>
<td>101.5</td>
<td>0.15%</td>
<td>624.9</td>
<td>0.94%</td>
<td>31,278.1</td>
<td>47.26%</td>
</tr>
</tbody>
</table>

**San Mateo County Hazard Mitigation Plan**

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**SECTION 2 - Chapter 7**

**Landslide**
7.7 Scenario

Major landslides in San Mateo County most typically occur as a result of soil conditions affected by severe storms, groundwater, or human development. The worst-case scenario for landslide hazards in the planning area would generally correspond to a severe storm with heavy rain that caused flooding. Landslides are more likely during the late winter when the water table is high. After heavy rains from November to December, soils become saturated with water. As water seeps downward through upper soils that may consist of permeable sands and gravels and as it accumulates on impermeable silt, it will weaken and destabilize the slope. A short intense storm could cause saturated soil to move, resulting in landslides. As rains continue, the groundwater table rises, adding to the weakening of the slope. Gravity, poor drainage, a rising groundwater table, and poor soil exacerbate hazardous conditions.

Mass movements are becoming a greater concern as development moves outside of city centers and into areas with less developed infrastructure. Most mass movements would be isolated events affecting specific areas. It is probable that private and public property, including infrastructure, would be affected. Mass movements could affect bridges that pass over landslide-prone ravines and knock out rail service through the County. Road obstructions caused by mass movements would create isolation problems for residents and businesses in sparsely developed areas. Property owners exposed to steep slopes may suffer damage to property or structures. Landslides carrying vegetation such as shrubs and trees may cause a break in utility lines, cutting off power and communications to residents.

Continued heavy rains and flooding would complicate the problem further. As emergency response resources are applied to problems with flooding, it is possible they will be unavailable to assist with landslides across San Mateo County.

7.8 Issues

Important issues associated with landslide hazards in San Mateo County include but are not limited to the following:

- The data and science regarding mapping and assessing landslide hazards are constantly evolving. As new data and science become available, assessments of landslide risk should be re-evaluated.
- The impact of climate change on landslides is uncertain. If climate change affects atmospheric conditions, the exposure to landslide risks in San Mateo County could increase.
- There are existing homes in landslide risk areas throughout the County. The degree of vulnerability of these structures depends on the codes and standards applied in constructing the structures.
- Future development could lead to more homes in landslide risk areas.
- Landslides may cause negative environmental consequences, including water quality degradation.
- The risk associated with the landslide hazard overlaps the risk associated with other hazards, including earthquake, flooding, and wildfire. The County has an opportunity to seek mitigation alternatives with multiple objectives that can reduce risk for multiple hazards.
Chapter 8.
Severe Weather

8.1 General Background

Severe weather refers to any dangerous meteorological phenomena with the potential to cause damage, serious social disruption, or loss of human life. It includes thunderstorms, downbursts, tornadoes, waterspouts, snowstorms, ice storms, and dust storms, among other events.

Severe weather can be categorized into two groups: systems that form over wide geographic areas are classified as general severe weather; those with a more limited geographic area are classified as localized severe weather. Technically, severe weather is not the same as extreme weather, which refers to unusual weather events at the extremes of the historical distribution for a given area.

The most common severe weather events that impact the Planning Area are tornadoes, windstorms, fog, heavy rains, thunderstorms, and lightning. Tidal impacts, while a regular phenomenon and not a hazardous event, is also considered due to its impact on coastal erosion. In northern parts of California, winter weather (i.e., snowstorms, ice, and extreme cold) can be included in this category; however, winter weather does not notably impact the Planning Area. Flooding issues associated with severe weather are discussed in Chapter 6.

8.1.1 Tornadoes

A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. Tornadoes are often (but not always) visible as a funnel cloud. On a local-scale, tornadoes are the most intense of all atmospheric phenomena.
circulations and wind can reach destructive speeds of more than 300 miles per hour (mph). A tornado’s vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long. Figure 8-1, as adopted from Federal Emergency Management Agency (FEMA), illustrates the potential impacts and damage from tornadoes of different magnitude. Tornadoes can occur throughout the year at any time of day but are most frequent in the spring during the late afternoon. As shown in Figure 8-2, California has a relatively low risk compared to states in the midwestern and southern United States.

**Figure 8-1. Potential Impact and Damage from a Tornado**

**Figure 8-2. Tornado Risk Areas in the Coterminous United States**

Note: The approximate location of San Mateo County is indicated by the black circle.
8.1.2 Windstorms

Windstorms are generally short-duration events involving straight-line winds or gusts of over 50–60 mph, strong enough to cause property damage. Damage from such winds accounts for half of all severe weather reports in the lower 48 states. Wind speeds can reach up to 100 mph and can produce a damage path extending for hundreds of miles. There are seven types of damaging winds:

- **Straight-line winds**—Any thunderstorm wind that is not associated with rotation; this term is used mainly to differentiate from tornado winds. Most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft.

- **Downdraft**—A small-scale column of air that rapidly sinks toward the ground.

- **Downburst**—A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst or damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.

- **Microbursts**—Microbursts are small concentrated downbursts that produce an outward burst of damaging winds at the surface. Microbursts are generally less than 2.5 miles across and short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph. There are two kinds of microbursts: wet and dry. A wet microburst is accompanied by heavy precipitation at the surface. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.

- **Gust front**—The leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push air above them, forming a shelf cloud or detached roll cloud.

- **Derecho**—A widespread thunderstorm wind caused when new thunderstorms form along the leading edge of an outflow boundary (the boundary formed by horizontal spreading of thunderstorm-cooled air). The word “derecho” is of Spanish origin and means “straight ahead.” Thunderstorms feed on the boundary and continue to reproduce. Derechos typically occur in summer when complexes of thunderstorms form over plains, producing heavy rain and severe wind. The damaging winds can last a long time and cover a large area.

- **Bow Echo**—A linear wind front bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be 200 miles long, last for several hours, and produce extensive wind damage at the ground.

Windstorms can result in collapsed or damaged buildings, damaged or blocked roads and bridges, damaged traffic signals, streetlights, and parks, and other damage. Wind speeds as low as 32 mph can cause structural damage, and winds of 100 mph can destroy wood-frame structures (Seattle Office of Emergency Management 2014). They can also cause direct losses to buildings, people, and vital equipment. There are direct...
consequences to the local economy resulting from windstorms and the associated physical damage and interrupted services.

Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents can create lift and suction forces that act to pull building components and surfaces outward. As positive and negative forces impact a building’s doors, windows, and walls, the result can be roof or building component failures and considerable structural damage. The effects of winds are magnified in the upper levels of multi-story structures.

Debris carried along by extreme winds can contribute directly to loss of life and indirectly to the failure of protective building envelopes. Falling trees and branches can damage buildings, power lines, and other property and infrastructure. Tree limbs breaking in winds of only 45 mph can be thrown over 75 feet, so overhead power lines can be damaged even in relatively minor windstorm events. During wet winters, saturated soils cause trees to become less stable and more vulnerable to uprooting from high winds. Utility lines brought down by summer thunderstorms have also been known to cause fires, which start in dry roadside vegetation. Electric power lines falling down to the pavement create the possibility of lethal electric shock.

Downed trees and power lines, and damaged property also can be major hindrances to emergency response and disaster recovery. Emergency response operations can be complicated when roads are blocked or when power supplies are interrupted. Industry and commerce can suffer losses from interruptions in electric service and from extended road closures.

8.1.3 Fog

Fog is a cloud near the ground. Fog forms when air close to the ground can no longer hold all the moisture it contains. This occurs either when air is cooled to its dew point or the amount of moisture in the air increases. Heavy fog is particularly hazardous because it can restrict surface visibility. Severe fog incidents can close roads, cause vehicle accidents and airport delays, and impair the effectiveness of emergency response. Financial losses associated with transportation delays caused by fog have not been calculated in the United States, but it is known to be substantial. Fog can occur almost anywhere during any season and is classified based on how it forms, which is related to where it forms. Certain seasons are more likely to have foggy days or nights based on a number of factors, including topography.

Fog in the Bay Area and San Mateo County has different origins depending on the time of year. In the summer, the area is characterized by cool marine air and persistent coastal stratus and fog. In winter, fog typically originates from the Great Valley. Radiation (ground) fog forms in the moist regions of the Sacramento River Delta and arrives to the region via Suisun and San Pablo Bays and San Francisco Bays on cool easterly drainage winds. While this type of fog is less frequent than summer fogs, it is typically denser and more likely to lead to significantly reduced visibility (Golden Gate Weather Services 2009). Although fog seems like a minor hazard, it can have significant impacts. The California Highway Patrol (CHP) alone has records of at least four officers whose deaths were indirectly caused by or exacerbated by dense fog and poor visibility (CHP 2016).
8.1.4 Heavy Rains, Thunderstorms, and Lightning

Most severe storms in San Mateo County consist of either heavy rains or thunderstorms. Heavy rain, also known as heavy precipitation, refers to events where the amount of rain exceeds normal levels. The amount of precipitation needed to qualify an event as heavy rain will vary by location and season. Heavy rain is distinct from climate change analyses on increasing precipitation. It does not mean that the total amount of precipitation at a location has increased, just that the rain is occurring in a more intense event. More frequent heavy rain events, however, can serve as an indicator in changing precipitation levels. Heavy rain is most frequently measured by tracking frequency of events, analyzing the mean return period (MRP), and measuring the amount of precipitation in a certain period (most typically inches of rain falling within a 24-hour period) (EPA 2015).

A thunderstorm is a rain event that includes thunder and lightning. A thunderstorm is classified as “severe” when it contains one or more of the following: hail with a diameter of three-quarter inch or greater, winds gusting in excess of 50 knots (57.5 mph), or a tornado. Approximately 10 percent of the 100,000 thunderstorms that occur nationally every year are classified as severe (National Oceanic and Atmospheric Administration [NOAA] 2014).

Three factors cause thunderstorms to form: moisture, rising unstable air (air that keeps rising when disturbed), and a lifting mechanism to provide the disturbance. The sun heats the surface of the earth, which warms the air above it. If this warm surface air is forced to rise (hills or mountains can cause rising motion, as can the interaction of warm air and cold air or wet air and dry air) it will continue to rise as long as it weighs less and stays warmer than the air around it. As the air rises, it transfers heat from the surface of the earth to the upper levels of the atmosphere (the process of convection). The water vapor it contains begins to cool and it condenses into a cloud. The cloud eventually grows upward into areas where the temperature is below freezing. Some of the water vapor turns to ice and some of it turns into water droplets. Both have electrical charges. Ice particles usually have positive charges, and rain droplets usually have negative charges. When the charges build up enough, they are discharged in a bolt of lightning, which causes the sound waves we hear as thunder. Thunderstorms have three stages (see Figure 8-3):

- The developing stage of a thunderstorm is marked by a cumulus cloud that is being pushed upward by a rising column of air (updraft). The cumulus cloud soon looks like a tower (called towering cumulus) as the updraft continues to develop. There is little to no rain during this stage but occasional lightning. The developing stage lasts about 10 minutes.
- The thunderstorm enters the mature stage when the updraft continues to feed the storm, but precipitation begins to fall out of the storm, and a downdraft begins (a column of air pushing downward). When the downdraft and rain-cooled air spread out along the ground, they form a gust front, or a line of gusty winds. The mature stage is the most likely time for hail, heavy rain, frequent lightning, strong winds, and tornadoes. The storm occasionally has a black or dark green appearance.
- Eventually, a large amount of precipitation is produced and the updraft is overcome by the downdraft beginning the dissipating stage. At the ground, the gust front moves out a long distance...
from the storm and cuts off the warm moist air that was feeding the thunderstorm. Rainfall decreases in intensity, but lightning remains a danger.

There are four types of thunderstorms:

- **Single-Cell Thunderstorms**—Single-cell thunderstorms usually last 20 to 30 minutes. A true single-cell storm is rare, because the gust front of one cell often triggers the growth of another. Most single-cell storms are not usually severe, but a single-cell storm can produce a brief severe weather event. When this happens, it is called a pulse severe storm.

- **Multi-Cell Cluster Storm**—A multi-cell cluster is the most common type of thunderstorm. The multi-cell cluster consists of a group of cells, moving as one unit, with each cell in a different phase of the thunderstorm life cycle. Mature cells are usually found at the center of the cluster and dissipating cells at the downwind edge. Multi-cell cluster storms can produce moderate-size hail, flash floods, and weak tornadoes. Each cell in a multi-cell cluster lasts only about 20 minutes; the multi-cell cluster itself may persist for several hours. This type of storm is usually more intense than a single cell storm.

- **Multi-Cell Squall Line**—A multi-cell line storm, or squall line, consists of a long line of storms with a continuous well-developed gust front at the leading edge. The line of storms can be solid, or there can be gaps and breaks in the line. Squall lines can produce hail up to golf-ball size, heavy rainfall, and weak tornadoes, but they are best known as the producers of strong downdrafts. Occasionally, a strong downburst will accelerate a portion of the squall line ahead of the rest of the line. This produces what is called a bow echo. Bow echoes can develop with isolated cells as well as squall lines. Bow echoes are easily detected on radar but are difficult to observe visually.

- **Super-Cell Storm**—A super-cell is a highly organized thunderstorm that poses a high threat to life and property. It is similar to a single-cell storm in that it has one main updraft, but the updraft is extremely strong, reaching speeds of 150 to 175 miles per hour. Super-cells are rare. The main characteristic that sets them apart from other thunderstorms is the presence of rotation. The rotating updraft of a super-cell (called a mesocyclone when visible on radar) helps the super-cell to
produce extreme weather events, such as giant hail (more than 2 inches in diameter), strong
downbursts of 80 miles an hour or more, and strong to violent tornadoes.

Lightning occurs in all thunderstorms. There are two main types of lightning: intra-cloud lightning and cloud
to-ground lightning (National Weather Service, 2014). Lightning is an electrical discharge that results from the
buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough,
lightning appears as a “bolt.” This flash of light usually occurs within the clouds or between the clouds and
the ground. A bolt of lightning reaches temperatures approaching 50,000 degrees Fahrenheit (ºF) instantaneously.
The rapid heating and cooling of air near the lightning causes thunder. Lightning is a major threat during a
thunderstorm. In the United States, between 75 and 100 Americans are struck and killed by lightning each year.
Lightning also causes forest and brush fires and deaths and injuries to livestock and other animals. According
to the National Lightning Safety Institute, lightning causes more than 26,000 fires in the United States each
year. The institute estimates property damage, increased operating costs, production delays, and lost revenue
from lightning and secondary effects to be in excess of $6 billion per year. Impacts can be direct or indirect.

Ice, snow, and freezing rain storms are not part of the climate pattern in San Mateo County and the Bay Area.
Wintertime temperatures typically range from 45ºF to 60ºF, and there have only been 10 documented
instances of snowfall during a 143-year period. Snow may also occur in trace amounts or at higher elevations.
As noted at the beginning of this section, although ice storms, snow, and freezing rains are a significant natural
hazard, the extremely remote possibility of their occurrence in San Mateo County precludes any further
discussion in this analysis.

8.1.5 Tides and Coastal Erosion

Tides consist of long-period waves moving through the ocean as a result of pressures exerted by the moon and
sun. Tides originate in oceans and move towards the coast. They are more visible as the rise and fall of the sea
level surface closer to the coastline. High tide occurs when the highest part of the wave (the crest) reaches the
location in question, while low tide occurs when the lowest part of the wave (the trough) reaches the location
in question. The tidal range consists of the difference in height between high and low tide. Tides, water levels,
and tidal currents are monitored for a variety of reasons, including their relationship to weather, their impact
on local biology and the environment, their importance to the economy, and their potential impact on new
development, especially as climate change and sea level rise become better understood (NOAA no date [n.d.]).

The County of San Mateo and City of Pacifica have an additional reason to monitor the impacts and effects of
tides along their coastlines. Over time, tides reshape coastlines and alter shoreline morphology, sometimes
resulting in coastal erosion. Particularly in the City of Pacifica, coastal erosion has led to significant and visible
impacts as local cliffs are worn away by the regular motion of the tides. Portions of the City built along the edge
of the cliffs have gradually come closer to being “beachfront” property as the cliffs wear away. In fact, buildings
and infrastructure have fallen into the Pacific Ocean when the cliff and rocks beneath them have crumbled
from erosion. Refer to the Landslide Hazard Profile (Chapter 7) for more details on specific damages and losses
to the City of Pacifica. While storm surge, severe storm events, and coastal flooding exacerbate the
undercutting of the cliffs, it is the regular motion of the tides which present the greatest threat due to tidal
action being a sustained phenomenon. The 1997–1998 El Niño System led to the crest of the Pacifica cliff
retreating 13 meters (m) landward while the toe of the cliff retreated about 10 m. In contrast, the average long-term erosion rate for the cliffs in general is roughly 0.2 m per year. Land along the cliff also does not erode evenly, leading to more difficulties in prediction (U.S. Geological Survey [USGS] 2013). Therefore, while significant storms should be monitored due to their ability to cause a surge in erosion rates along the Pacifica cliffs, regular tidal erosion must also be monitored and mitigated to the greatest extent possible.

8.1.6 El Niño Effects on Severe Weather

El Niño is a type of natural climactic event which dramatically illustrates the impact of climate change on the frequency and intensity of severe storms, geologic hazard events, droughts, and fires. El Niño consists of oceanic and atmospheric phenomena related to unusually high temperatures on the surface of the eastern equatorial Pacific Ocean. These conditions occur once every few years and most likely start from a random, slight reduction in trade winds. Their exacerbation of severe weather is thought to be brought about by the release of greater amounts of heat in the atmosphere, which comes from an increase in water evaporating from the ocean (Keller 2008). NOAA operates a network of buoys to measure temperature, currents, and winds in the equatorial band of the Pacific Ocean. This allows researchers to determine the occurrence and strength of El Niño events. The strength of an event is determined by the Oceanic Niño Index (ONI), the three-month running mean of sea surface temperature departures from average in the Niño 3.4 region (NOAA 2015).

The 1997–1998 El Niño event gained national recognition for its contribution to hurricanes, floods, landslides, droughts, and fires that killed substantial numbers of people and caused billions of dollars in damages. Australia, Indonesia, and the Americas were particularly impacted by the 1997–1998 El Niño. La Niña is another type of weather phenomena, and it could be considered the opposite of an El Niño. It leads to cooler Pacific Ocean waters (Keller 2008). The next noteworthy El Niño event occurred over 2015–2016. The most recent event gained significant attention, particularly in California, since the State has already been dealing with the devastating impacts of a long-term drought (NOAA 2015). The 2015–2016 El Niño is currently considered one of the strongest three on record, going back to 1950. The 2015–2016 ONI values tied with the 1997–1998 event for severity, but other types of measurements indicate that the 1997–1998 event had greater impact (Climate.gov 2016).

8.2 Hazard Profile

8.2.1 Past Events

Table 8-1 summarizes past severe weather events in San Mateo County as recorded by NOAA since 1950. Although 86 events were reported to NOAA, only tornadoes, dense fog, thunderstorms with wind speeds over 50 knots, and windstorms with winds over 50 knots are listed below.
### Table 8-1. Severe Weather Events in San Mateo County since 1950

<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Deaths or Injuries</th>
<th>Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 1, 1958</td>
<td>Tornado</td>
<td>0</td>
<td>$825,030</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A tornado with a 0.2 mile length and 67 yard width impacted San Mateo County. This tornado does not have an associated magnitude.</td>
<td></td>
</tr>
<tr>
<td>March 10, 1986</td>
<td>Tornado</td>
<td>0</td>
<td>$30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A F0 tornado with a 0.2 mile length and 50 yard width impacted San Mateo County. The small waterspout moved ashore from the Pacific Ocean, flipped a car, and did minor property damage at a seaside restaurant at Moss Beach.</td>
<td></td>
</tr>
<tr>
<td>March 4, 1996</td>
<td>Heavy Rain</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>1.48 inches of rain fell in Redwood City. The rain accumulated on the roof of Office Depot causing it to collapse.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>January 2, 1998</td>
<td>Heavy Rain</td>
<td>12 Injuries</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rain-slick roads caused several car accidents.</td>
<td></td>
</tr>
<tr>
<td>January 11, 1998</td>
<td>Heavy Rain</td>
<td>1 Death</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Heavy rain contributed to a car accident. One fatality was recorded as a result of this event.</td>
<td></td>
</tr>
<tr>
<td>February 7, 1998</td>
<td>Tornado</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A F0 tornado with a 0.2-mile length and 50-yard width impacted San Mateo County. The weak tornado ripped up some trees. It appears to have begun as a waterspout and moved onshore.</td>
<td></td>
</tr>
<tr>
<td>February 13, 2000</td>
<td>Heavy Rain</td>
<td>0</td>
<td>$2,000,000</td>
</tr>
<tr>
<td>Widespread rain with 24-hour accumulations of more than 5 inches occurred over the area on Feb 13th into February 14th. Urban and small stream flooding occurred in most counties of the area. Many roads including Highway 1 and Highway 116 were closed. Twenty-nine people were evacuated in Pescadero due to high waters. A number of houses in Daly City were abandoned and eventually destroyed due to mudslides which were a result of the consecutive years of above average rain. The roof of a Home Depot collapsed due to the accumulation of heavy rain, flooding the interior of the store with 6 inches of rain and exposing the interior to continuing rain.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>December 15, 2002</td>
<td>Heavy Rain</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>December turned out to be one of the wettest on record at many locations throughout the area. There were three primary episodes of precipitation in December, the first a two-day storm on the 9th and 10th. With less than an inch and a half accumulation at any one location over the period, flooding problems were not an issue. However, the rainfall totals helped to further saturate the soil. The next and by far most serious storm episode begin on the 13th of the month and lasted on and off through the 21st. A very strong and moist jet stream developed across the Pacific Ocean and brought a series of storms into California. Wave after wave of locally heavy rain pounded the North Bay counties for days. Flooding became a serious issue, not just for urban and small stream flooding, but for mainstream flooding as well.</td>
<td></td>
</tr>
<tr>
<td>October 19, 2004</td>
<td>Thunderstorm Wind</td>
<td>0</td>
<td>$50,000</td>
</tr>
<tr>
<td>A thunderstorm produced a 60 mph wind gust that snapped two large trees, with one falling on a house.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 20, 2005</td>
<td>Tornado</td>
<td>0</td>
<td>$800,000</td>
</tr>
</tbody>
</table>
### TABLE 8-1. SEVERE WEATHER EVENTS IN SAN MATEO COUNTY SINCE 1950

<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Deaths or Injuries</th>
<th>Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 1, 2005</td>
<td>High Wind</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>December 18, 2005</td>
<td>High Wind</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>December 31, 2005</td>
<td>High Wind</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>February 27, 2006</td>
<td>High Wind</td>
<td>1 Death</td>
<td>$0</td>
</tr>
<tr>
<td>January 4, 2008</td>
<td>High Wind</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>February 15, 2009</td>
<td>High Wind</td>
<td>0</td>
<td>$25,000</td>
</tr>
<tr>
<td>April 14, 2009</td>
<td>High Wind</td>
<td>0</td>
<td>$80,000</td>
</tr>
<tr>
<td>May 2, 2009</td>
<td>Dense Fog</td>
<td>0</td>
<td>$25,000</td>
</tr>
</tbody>
</table>

A F1 tornado with a 3-mile length and 30-yard width impacted San Mateo County. The tornado damaged approximately 60 structures.

A strong winter storm brought a 64 mph gust to San Francisco Airport.

A wind gust reached 71 mph at Angel Island during a winter storm.

A wind gust measured 58 mph at San Francisco Airport during a strong winter storm.

A storm system produced winds of varying levels throughout the region. In Half Moon Bay, wind gusts of 59 mph were recorded. In Daly City, wind gusts of 63 mph were recorded. San Francisco Airport recorded gusts of 60 to 71 mph, Point San Pablo had 66 mph gusts, and Pillar Point recorded gusts of 73 mph.

One fatality was recorded: a 73 year old woman was killed in Boulder Creek when wind gusts estimated at 70 mph tore the top off a redwood tree and hurled it into her yard, where she was walking her dog.

A very strong cyclone slammed into the San Francisco and Monterey Bay areas bringing flooding rains, high winds, record high surf and coastal flooding. Hundreds of thousands of residences and businesses were without power, some for several days due to high winds toppling power lines. Property damage in the millions was reported due to falling trees hitting cars and structures as well as damage to roads due to heavy rain. Winds gusted to 66 mph at Pigeon Point, 67 mph at San Francisco Airport, 58 mph and 81 mph at Pillar Point, 58 mph at Oakland Airport, and 72 mph in Daly City.

An approaching eastern Pacific storm produced strong wind and heavy rain behind the warm front as it moved through the San Francisco Bay Area. Over 61,000 Bay Area customers lost power between 3 a.m. and 4 p.m. The Pigeon Point observation station reported a peak wind gust to 58 mph at 3:09 a.m. High wind knocked down numerous trees in the Santa Cruz Mountains causing Highway 9 at Highway 236 to close at 6:30 a.m. and knocked down power lines closing Thurber Lane at Twelfth Avenue during the morning. Trees and branches slowed traffic along Highway 17, Bear Creek Road and Middle Ellen Road.

High winds wreak havoc along the San Francisco Bay Area shoreline causing numerous power outages, downed trees and forcing a big-rig onto its side. At 5:35 p.m. PST a big-rig blew over in the westbound lane of the San Mateo Bridge closing the entire bridge for more than an hour. Shortly afterwards a seventy foot fishing vessel was blown into the bridge after losing power. At 4:54 p.m. PST the Redwood City Mesonet observation site reported a gust to 50 knots.

Dense fog along with a slippery road surface caused eight traffic collisions along Highway 17 in the Santa Cruz County mountains. No major injuries were reported.
### Table 8-1. Severe Weather Events in San Mateo County Since 1950

<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Deaths or Injuries</th>
<th>Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 13, 2009</td>
<td>High Wind</td>
<td>0</td>
<td>$3,400,000</td>
</tr>
<tr>
<td>October 13, 2009</td>
<td>Heavy Rain</td>
<td>3 Injuries, 1 Death</td>
<td>$100,000</td>
</tr>
<tr>
<td>January 18, 2010</td>
<td>Thunderstorm Wind</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>January 18, 2010</td>
<td>High Wind</td>
<td>0</td>
<td>$230,000</td>
</tr>
<tr>
<td>January 19, 2010</td>
<td>High Wind</td>
<td>0</td>
<td>$40,000</td>
</tr>
</tbody>
</table>

A strong low pressure system made its way through Northern and Central California accompanied by deep tropical moisture and very strong winds. Heavy rain combined with the wind to cause numerous trees, tree limbs, and power and telephone poles to fall. Pacific Gas and Electric reported over 277,000 customers had lost power in the San Francisco and Monterey Bay areas with a cost of over thirteen million dollars in damages. The record breaking heavy rain also led to flooding and debris flows. The Los Gatos RAWS reported a wind gust to 68 mph at 8:32 a.m. Also, fierce winds downed trees on Rapley Ranch Road near State Route 35, on State Route 35 near Mountain House Restaurant in Kings Mountain, and along State Route 84 at the junction of State Route 35.

A huge oak tree crushed a house in Redwood City and brought down power lines. Also in Redwood City, dozens of trees were toppled, including at least two that hit houses or parked cars. Within San Mateo County, at least 47 trees and 31 sets of power lines were knocked over. In Pescadero, a large tree was blown onto North Street at Pescadero Road, blocking both lanes of traffic. Wind also caused power outages all across San Mateo County. About 58,000 residents lost power during the storm.

This powerful rainstorm overwhelmed pipes and manholes in San Mateo, San Carlos, and Millbrae causing over 127,000 gallons of untreated sewage to flow into the streets and creeks. Over 55,000 gallons of raw sewage spilled into San Francisco Bay.

At 7:47 a.m. the California Highway Patrol responded to a three car collision on Highway 1 at Devil's Slide. Heavy rain and strong winds were a contributing factor of the crash. A 74-year-old woman lost her life in the accident.

Squall line thunderstorms moved across the San Francisco International Airport producing wind gusts to 59 mph. Numerous power lines and trees were knocked down when strong wind combined with saturated soil.

High wind knocked over power poles along San Mateo County's coast causing 12,000 customers to lose power. Downed power lines were reported in Half Moon Bay, at the intersection of Cedar and Acacia Avenues, along the 700 block on Main Street, and at Park Avenue in Moss Beach; and in Pacifica. The wind also caused damage to fixtures on the roof at the Half Moon Bay City Hall, and it dislodged a patio roof behind Sam's Chowder House, damaging solar panels used to power the restaurant. The Half Moon Airport Mesonet site reported a wind gust of 69 mph at 10:00 a.m. PST. At least 12,000 customers lost power in San Mateo County.
### TABLE 8-1. SEVERE WEATHER EVENTS IN SAN MATEO COUNTY SINCE 1950

<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Deaths or Injuries</th>
<th>Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 20, 2010</td>
<td>High Wind</td>
<td>0</td>
<td>$260,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>January 20, 2010</td>
<td>Thunderstorm Wind</td>
<td>1 Injury</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>February 16, 2010</td>
<td>Dense Fog</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>December 28, 2010</td>
<td>High Wind</td>
<td>0</td>
<td>$15,000</td>
</tr>
<tr>
<td>February 15, 2011</td>
<td>High Wind</td>
<td>0</td>
<td>$150,000</td>
</tr>
<tr>
<td>November 27, 2011</td>
<td>Dense Fog</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>November 29, 2011</td>
<td>Dense Fog</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

High wind blew an oak tree down onto a car while a woman was driving it along Old La Honda Road near Woodside. The woman was unhurt and the car sustained minor damage. In Woodside, State Route 84 was closed at Grandview Drive due to downed trees. The ASOS at the San Francisco International Airport reported a peak wind gust of 62 mph at 6:09 a.m. PST. And, the Bay Area Air Quality Management District’s Point San Pablo Mesonet site reported a peak wind gust of 59 mph at 6:00 a.m. PST. The Spring Valley RAWS site reported a peak wind gust of 73 mph at 6:00 a.m. PST. And, the Pigeon Point automated site reported a peak wind gust of 62 mph at 5:00 a.m. PST. Power outages occurred throughout the area forcing Canada College in Redwood City, the College of San Mateo and Stanford University to cancel classes.

Strong winds brought trees and power lines down across the San Francisco Bay Area. In Menlo Park, a driver was injured when the top of a Redwood tree came crashing through his windshield as he was driving on Santa Cruz Avenue near Hillview Middle School. Strong wind brought trees and power lines down onto State Route 1 just north of the Santa Cruz and San Mateo County line. The road was closed for two hours.

The third in a series of significant storms brought strong winds and heavy rain to the San Francisco and Monterey Bay areas. This storm, the strongest of the week, developed over the Pacific Ocean with a strong parent low pressure based in the Gulf of Alaska. Around 159,000 customers lost power across the San Francisco Bay area with nearly 22,000 customers without power in the Monterey Bay area. Numerous power lines and trees were knocked down when strong wind combined with saturated soil. Also, areas of flooding occurred causing mainly problems for vehicles. A RAWS site at Spring Valley reported a wind gust to 64 mph at 9:19 a.m. PST.

The NWS issued a dense fog advisory for the Bay Area, with notice of visibility being less than a quarter-mile in many areas.

Damaging wind brought a tree down onto State Route 9 causing its closure from one mile south to 2.9 miles south of the south Junction of State Route 236. The Highway was closed from 6:20 p.m. to 10:29 p.m. PST.

Strong and gusty wind developed ahead of a long wave trough. Southwesterly to westerly winds began to increase late in the afternoon and peaked in the late evening. A mesonet automated weather reporting system measured a wind gust of 60 mph at midnight. Other automated observation systems around the area above 1,000 feet in elevation reported gusts up to 83 mph. The wind caused large trees and power lines to fall. Also, road closures occurred due to the downed trees and power lines. Overall, more than 6,500 customers lost power in the San Francisco Bay Area.

Dense fog advisories were issued for multiple bridges around the Bay Area, including the San Mateo Bridge, the Dumbarton Bridge, the Benicia Bridge and the Carquinez Bridge. Inland roads were expected to have heavy fog and poor visibility until mid-afternoon.
### TABLE 8-1. SEVERE WEATHER EVENTS IN SAN MATEO COUNTY SINCE 1950

<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Deaths or Injuries</th>
<th>Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 14, 2012</td>
<td>Heavy Rain</td>
<td>5 Injuries</td>
<td>$50,000</td>
</tr>
<tr>
<td>November 28, 2012</td>
<td>High Wind</td>
<td>0</td>
<td>$1,000</td>
</tr>
<tr>
<td>December 21, 2012</td>
<td>Heavy Rain</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>April 8, 2013</td>
<td>Heavy Rain</td>
<td>0</td>
<td>$1,000</td>
</tr>
<tr>
<td>February 28, 2014</td>
<td>Heavy Rain</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>November 10, 2014</td>
<td>Dense Fog</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>November 28, 2014</td>
<td>Dense Fog</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>December 11, 2014</td>
<td>Heavy Rain</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>February 9, 2015</td>
<td>Heavy Rain</td>
<td>0</td>
<td>$0</td>
</tr>
</tbody>
</table>

Dense fog advisories were issued for Bay Area bridges, including the San Mateo and Bay Bridges. Overall visibility for the region ranged between a half-mile to 300 feet.

Two accidents shut down Highway 1 for brief periods. One occurred on March 14 which was a head-on crash just south of Devil's Slide. Two sedans were involved with minor injuries to the two drivers. The other occurred on March 16 when two trucks collided at 10:45 am west of the turnoff for Ox Mountain landfill. Three riders suffered minor cuts and bruises.

A wind gust of 61 mph was measured at Spring Valley RAWS, at elevation of 1,075 feet, causing numerous downed trees and some power outages. A wind gust of 75 mph was measured at Los Gatos RAWS, at elevation 1,842 feet, causing numerous downed trees and some power outages.

A series of storm systems, part of a large Atmospheric River type of pattern, impacted the area during late December 2012. From December 21 through 26, heavy rain, gusty winds, flooding, and mudslides occurred across the Bay Area in these consecutive events. Downed trees, powerlines, and flooded roadways impacted residents over the Christmas holiday season.

High winds impacted operations at San Francisco International Airport overnight with wind gusts measured at 60 mph. High winds blew out the front window of a house in Daly City.

A Pacific storm system moved across the Bay Area on February 28. It dropped several inches of rainfall and brought gusty winds to the area. This resulted in flooding of urban areas, small streams and creeks, and damage to power lines and trees, and a few localized mud and rockslides.

Dense fog surrounded the San Francisco Bay Area, including San Mateo County.

The California Highway Patrol issued dense fog advisories for a number of Bay Area bridges, including San Mateo Bridge, and on U.S. Highway 101. Patchy, thick fog and poor visibility was reported and estimated to last until 9 a.m.

An Atmospheric River event brought heavy rain and gusty winds with a strong winter storm that impacted the Bay Area for several days in mid-December.

A strong winter storm finally impacted California following nearly a month and a half of no rain and the driest January on record. The storm brought heavy rain, gusty winds, and damage to trees and power lines along with some minor flooding of urban areas. A 72 hour rainfall total of 5.43 inches was measured from Emerald Lake Hills at elevation 472 feet. This was the highest storm total in San Mateo County.
### TABLE 8-1. SEVERE WEATHER EVENTS IN SAN MATEO COUNTY SINCE 1950

<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Deaths or Injuries</th>
<th>Property Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 10, 2015</td>
<td>Dense Fog</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

The NWS issued dense fog advisories for all valleys and coastal locations in the San Francisco and Monterey Bay areas. Visibility reports were estimated to be a quarter-mile or less, and officials noted that visibility could drop to zero in parts of the San Francisco Bay Area.


Note: San Mateo County has not experienced any lightning events unrelated to storm events, per NOAA records.

<table>
<thead>
<tr>
<th>Notes</th>
<th>ASOS</th>
<th>Automated Surface Observing Systems</th>
<th>F#</th>
<th>Fujita Scale, followed by magnitude of tornado</th>
<th>mph</th>
<th>PST</th>
<th>Pacific Standard Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Not Applicable</td>
<td>NWS</td>
<td>National Weather Service</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAWS</td>
<td>Remote Automatic Weather Stations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8.2.2 Location

Severe weather events have the potential to happen anywhere in San Mateo County. Communities in low-lying areas next to streams or lakes are more susceptible to flooding. Regions near San Francisco Bay are more likely to experience fog. Wind events are most damaging to areas that are heavily wooded.

Tornadoes

Tornadoes have been documented in every state in the United States, and on every continent with the exception of Antarctica. Approximately 1,200 tornadoes occur in the United States each year, with the central portion of the country experiencing the most. Tornadoes can occur at any time of the year, with peak seasons at different times for different states (National Severe Storms Laboratory [NSSL] 2015). As noted earlier, the State of California and San Mateo County have a lower risk for tornados than elsewhere in the country. Tornado risk within the County is fairly equal across the region; historical tornado events have been documented on both the bayside and coastal region of the County. Residents near the Pacific Ocean or the San Francisco Bay (as opposed to the central area of the County) may be at a slightly higher risk for tornados; however, historical data is not sufficiently exhaustive enough to confirm this potential trend. Tornadoes are usually localized; however, severe thunderstorms can result in conditions favorable to the formation of numerous or long-lived tornadoes.

Windstorms

All of San Mateo County is subject to high winds from thunderstorms, tornadoes, and other severe weather events. According to the FEMA Winds Zones of the United States map (Figure 8-4), San Mateo County is located in Wind Zone I, where wind speeds can reach up to 130 mph. Figure 8-4 indicates the strength of windstorms in the United States, and the general location of the most wind activity. This is based on 40 years of tornado data and 100 years of hurricane data, collected by FEMA.

![Figure 8-4. Wind Zones in the United States](image)

Source: FEMA 2010

Note: The black oval indicates the approximate location of San Mateo County.
Fog

The Pacific, Atlantic Canada, and New England coastlines, along with the valleys and hills in the Appalachian Mountains, are the areas most prone to fog on the North American continent (Keller 2008). San Mateo County, therefore, is more likely to experience fog than many other parts of the country.

Additionally, the Bay Area, including San Mateo County, has a unique topography that when combined with the California climate and nearby bay/maritime resources, creates multiple microclimates. Microclimates are small but distinct climates within a larger area. Temperature differences of as much as 10 to 20°F can be found only miles apart in the Bay Area, and those differences can grow significantly from one end of the region to another. In spring 2001, Half Moon Bay documented temperatures in the 50s while Antioch in Contra Costa County had temperatures of around 100°F (SF Gate 2001).

Microclimates are significant in the case of fog events because certain cities in the County may experience fog, while only a few miles away, clear skies predominate. Western breezes may bring fog from the ocean, but it will be blocked from passing certain points by mountainous ridges. Even the type of fog in microclimates may vary; some regions are more prone to experience radiation fog, while others only receive a canopy of high fog. This is usually based on the proximity of the location to mountains, ridges, fault lines, and water sources, among other factors.

Heavy Rains, Thunderstorms, and Lightning

The frequency of heavy rain events remained fairly consistent between 1910 and the 1980s; however, it has risen substantially since then (EPA 2015). Certain locations have noted more significant increases in heavy precipitation events (including snow) than others. Most notably, the Northeast and Midwest have experienced the greatest changes, although the Southeast, Great Plains, Northwest, Alaska, and Southwest have also noted increases (Tompkins 2014). Although San Mateo County experiences heavy rain events, it is at a reduced level compared to other parts of the country.

Thunderstorms affect relatively small localized areas, rather than large regions like winter storms and extreme temperature events. Thunderstorms can strike in all regions of the United States; however, they are most common in the central and southern states. The atmospheric conditions in these regions of the country are ideal for generating these powerful storms. It is estimated that there are as many as 40,000 thunderstorms each day worldwide. The most thunderstorms are seen in the southeast United States, with Florida having the highest incidences (80 to over 100 thunderstorm days each year). San Mateo County can experience an average of 10 thunderstorm days each year (NWS 2010).

The entire extent of San Mateo County is exposed to some degree of lightning hazard, though exposed points of high elevation have significantly higher frequency of occurrence. As noted earlier, lightning instances in the County have only been associated with other storm events and not as a standalone hazard.
8.2.3 Frequency

Predicting the frequency of severe weather events in a constantly changing climate is a difficult task. The Planning Area can expect to experience exposure to and adverse impacts from some type of severe weather event at least annually.

8.2.4 Severity

The most common problems associated with severe storms are immobility and loss of utilities. Fatalities are uncommon, but can occur. Roads may become impassable due to flooding, downed trees, or a landslide. Power lines may be downed due to high winds, and services such as water or phone may not be able to operate without power. Lightning can cause severe damage and injury. Physical damage to homes and facilities can be caused by wind or flooding.

Windstorms can be a frequent problem in the Planning Area and have been known to cause damage to utilities. The predicted wind speed given in wind warnings issued by the National Weather Service (NWS) is for a one-minute average; gusts may be 25 to 30 percent higher. Lower wind speeds typical in the lower valleys are still high enough to knock down trees and power lines and cause other property damage. Higher elevations in the County can experience much higher winds under more varied conditions.

Tornadoes are potentially the most dangerous of local storms, but they are not common in the Planning Area. If a major tornado were to strike within the populated areas of the County, damage could be widespread. Businesses could be forced to close for an extended period or permanently, fatalities could be high, many people could be homeless for an extended period, and routine services such as telephone or power could be disrupted. Buildings may be damaged or destroyed. Because the County has never experienced a tornado more severe than an EF1, however, such severity is unlikely.

Heavy precipitation, which in the County almost always takes the form of rain, can have significant impacts, including crop damage, soil erosion, and increased risk of flood. Stormwater runoff from heavy rains can also impair water quality by washing pollutants into water bodies (EPA 2015). Soil erosion, particularly along the coast, is a significant concern for San Mateo County, and is further explored in the landslide and flood hazard profiles. Thunderstorms carry the same risks as heavy precipitation events, and depending on the type of storm, they can also serve as breeding grounds for tornados, lightning, and heavy winds, increasing risk of injury and property damage (Keller 2008).

Lightning severity is typically investigated for both property damage and life safety (injuries and fatalities). The number of reported injuries from lightning is likely to be low, and County infrastructure losses can equate to up to thousands of dollars each year. The relationship of lightning to wildfire ignitions in the County increases the significance of this hazard. There are no recorded instances of lightning appearing alone (without a storm) in San Mateo County, and any lightning damage is likely to be compounded by other storm damage.

8.2.5 Warning Time

Meteorologists can often predict the likelihood of a severe storm or other severe weather event. This can give several days of warning time. However, meteorologists cannot predict the exact time of onset or severity of
the storm. Some storms may come on more quickly and have only a few hours of warning time. The San Francisco Bay Area Weather Forecast Office of the NWS monitors weather stations and issue watches and warnings when appropriate to alert government agencies and the public of possible or impending weather events. The watches and warnings are broadcast over NOAA weather radio and are forwarded to the local media for retransmission using the Emergency Alert System.

8.3 Secondary Hazards

The most significant secondary hazards associated with severe local storms are floods, falling and downed trees, landslides, and downed power lines. Stormwater from heavy rain can overwhelm both natural and man-made drainage systems, causing overflow and property destruction. Landslides occur when the soil on slopes becomes oversaturated and fails. Storms can also exacerbate existing areas of vulnerability, such as increasing the frequency of erosion and landslide along coastal cliffs in San Mateo County. Fires (both structural and wild), along with power outages, can occur as a result of lightning strikes.

8.4 Exposure

8.4.1 Population

A lack of data separating severe weather damage from flooding and landslide damage prevented a detailed analysis for exposure and vulnerability. However, it can be assumed that the entire County is exposed to some extent to severe weather events. Certain areas are more exposed due to geographic location and localized weather patterns. Populations living at higher elevations with large stands of trees or power lines may be more susceptible to wind damage and black out, while populations living in low lying areas are at risk for flooding.

8.4.2 Property

All of the buildings in the Planning Area are considered to be exposed to the severe weather hazard, but structures in poor condition or in particularly vulnerable locations (located on hilltops or exposed open areas) may risk the most damage. The frequency and degree of damage will depend on specific locations.

8.4.3 Critical Facilities and Infrastructure

All critical facilities exposed to flooding (see Chapter 6) are also likely exposed to severe weather. Facilities on higher ground may also be exposed to wind damage or damage from falling trees. The most common problems associated with severe weather are loss of utilities. Downed power lines can cause blackouts, leaving large areas isolated. Phone, water and sewer systems may not function. Roads may become impassable from a secondary hazard such as landslides.

8.4.4 Environment

Severe storm events can drastically affect the physical environment, changing natural landscapes. Natural habitats such as streams and trees are exposed to the elements during a severe storm and risk major damage and destruction. Prolonged rains can saturate soils and lead to slope failure. Flooding caused by severe weather can cause stream channel migration.
8.5 Vulnerability

There are currently no loss estimation tools with uniform damage functions for severe weather events. This can be attributed to the variety of impacts that severe weather events generate. Also, the severity of severe weather events varies by location. Since secondary effects of severe weather events include flooding, landslides or even wildfires in drier climates, the vulnerability assessments under those hazards can provide emergency managers a gauge of the economic impact of severe weather events.

8.5.1 Population

Vulnerable populations are the elderly, low income, or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Power outages can be life-threatening to those dependent on electricity for life support. Isolation of these populations is a significant concern. These populations face isolation and exposure during severe weather events and could suffer more secondary effects of the hazard.

Nationally, lighting is one of the leading causes of weather-related fatalities (Centers for Disease Control [CDC] 2013). The majority of injuries and deaths associated with lighting strikes occur when people are outdoors; however, almost one-third of lightning related injuries occur indoors. Males are five times more likely than females to be struck by lightning, and people between the ages of 15 and 34 account for 41 percent of all lightning strike victims (CDC 2013).

8.5.2 Property

All property is vulnerable during severe weather events, but structures in poor condition or constructed to low building code standards risk the most damage. Those in higher elevations and on ridges may be more prone to wind damage. Those that are located under or near overhead lines or near large trees may be damaged in the event of a collapse.

Loss estimations for the severe weather hazard are not based on modeling utilizing damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing 10 percent, 30 percent and 50 percent of the replacement value of exposed structures. This allows emergency managers to select a range of potential economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 8-2 lists the estimates of potential loss to the general building stock.

<table>
<thead>
<tr>
<th>Location</th>
<th>Total Replacement Value</th>
<th>10% Damage</th>
<th>30% Damage</th>
<th>50% Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>$3,895,740,346</td>
<td>$389,574,035</td>
<td>$1,168,722,104</td>
<td>$1,947,870,173</td>
</tr>
<tr>
<td>Belmont</td>
<td>$10,308,416,428</td>
<td>$1,030,841,643</td>
<td>$3,092,524,928</td>
<td>$5,154,208,214</td>
</tr>
<tr>
<td>Brisbane</td>
<td>$4,240,552,559</td>
<td>$424,055,256</td>
<td>$1,272,165,768</td>
<td>$2,120,276,279</td>
</tr>
<tr>
<td>Burlingame</td>
<td>$21,380,649,949</td>
<td>$2,138,064,995</td>
<td>$6,414,194,985</td>
<td>$10,690,324,975</td>
</tr>
</tbody>
</table>

Table 8-2. Loss Potential for Severe Weather
TABLE 8-2. LOSS POTENTIAL FOR SEVERE WEATHER

<table>
<thead>
<tr>
<th></th>
<th>Total Replacement Value</th>
<th>Estimated Loss Potential from Severe Weather</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10% Damage</td>
</tr>
<tr>
<td>Colma</td>
<td>$2,326,464,412</td>
<td>$232,646,441</td>
</tr>
<tr>
<td>Daly City</td>
<td>$24,938,831,232</td>
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</tr>
<tr>
<td>East Palo Alto</td>
<td>$5,857,698,432</td>
<td>$585,769,843</td>
</tr>
<tr>
<td>Foster City</td>
<td>$8,218,878,256</td>
<td>$821,887,826</td>
</tr>
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<td>Half Moon Bay</td>
<td>$7,849,930,382</td>
<td>$784,993,038</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>$4,700,710,511</td>
<td>$470,071,051</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>$18,505,489,077</td>
<td>$1,850,548,908</td>
</tr>
<tr>
<td>Millbrae</td>
<td>$9,769,920,735</td>
<td>$976,992,074</td>
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<td>Pacifica</td>
<td>$11,068,838,243</td>
<td>$1,106,883,824</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>$2,722,951,324</td>
<td>$272,295,132</td>
</tr>
<tr>
<td>Redwood City</td>
<td>$36,012,737,585</td>
<td>$3,601,273,759</td>
</tr>
<tr>
<td>San Bruno</td>
<td>$17,413,414,915</td>
<td>$1,741,341,491</td>
</tr>
<tr>
<td>San Carlos</td>
<td>$20,194,621,859</td>
<td>$2,019,462,186</td>
</tr>
<tr>
<td>San Mateo</td>
<td>$43,325,264,111</td>
<td>$4,332,526,411</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>$32,013,427,549</td>
<td>$3,201,342,755</td>
</tr>
<tr>
<td>Woodside</td>
<td>$2,915,455,082</td>
<td>$291,545,508</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>$32,208,641,175</td>
<td>$3,220,864,117</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$319,868,634,162</strong></td>
<td><strong>$31,986,863,416</strong></td>
</tr>
</tbody>
</table>

Note: Values shown are accurate only for comparison among results in this plan. See Section X for a discussion of data limitations.

**8.5.3 Critical Facilities and Infrastructure**

Incapacity and loss of roads are the primary transportation failures, most of which are associated with secondary hazards. Landslides that block roads are caused by heavy prolonged rains. High winds can cause significant damage to trees and power lines, with obstructing debris blocking roads, incapacitating transportation, isolating population, and disrupting ingress and egress. Of particular concern are roads providing access to isolated areas and to the elderly.

Severe windstorms, downed trees, and stormwater can create serious impacts on power and aboveground communication lines. Loss of electricity and phone connection could result in isolation because some residents would be unable to call for assistance.

**8.5.4 Environment**

The vulnerability of the environment to severe weather is the same as the exposure.

**8.5.5 Economic Impact**

Economic impact will be largely associated with disrupted services as a result of downed debris blocking transportation infrastructure and potential disruption of energy resources. Prolonged obstruction of major
routes due to landslides, debris, or floodwaters can disrupt the shipment of goods and other commerce. Large and prolonged storms can have negative economic impacts for an entire region.

8.6 Future Trends in Development

Many of the impacts associated with severe weather hazards can be addressed through proactive planning and utilization of best available information in making land use decisions. San Mateo County has and will achieve this goal through the implementation of its Shared Vision, while its jurisdictions will be able to incorporate these concerns into their General Plans. The General Plan serves as a long-term policy guide for the physical, economic, and environmental growth of a city and includes a statement of the community’s vision of its ultimate physical growth. The County’s Shared Vision shares similar purposes. Implementation of these guidelines and goals, along with other programs such as Building Code enforcement, public information, and early warning will help San Mateo County to manage the probable impacts of severe weather hazards as the County expands and grows.

8.7 Scenario

Impacts of severe weather can be significant, particularly when secondary hazards of flood and landslide occur. A worst-case event would involve prolonged high winds accompanied by thunderstorms. Such an event would have both short-term and longer-term effects. Initially, schools and roads would be closed due to power outages caused by high winds and downed tree obstructions. In more rural areas, some subdivisions could experience limited ingress and egress. Prolonged rain could produce flooding, overtopped culverts with ponded water on roads, and landslides on steep slopes. Significant erosion and landslides along the coast may occur, further increasing the vulnerability of residents living right on the edge of coastal cliffs. Flooding and landslides could obstruct roads and bridges, isolating residents. Fog after the storm, resulting from the heavy moisture still in the area, could increase traffic accidents as visibility worsens.

8.8 Issues

Severe local storms are probably the most common widespread hazard. They affect large numbers of people in the Planning Area when they occur. Severe storms can quickly overwhelm city and county resources. Citizens should be prepared for these types of storms: family plans should be developed, disaster kits should be put in homes, workplaces, schools and cars, and every family member should be taught how to shut off household utilities. Initiating early dismissal from schools and business is an effective mitigation measure and should be encouraged.

Severe weather cannot be prevented, but measures can be taken to mitigate the effects. Critical infrastructure and utilities can be hardened to prevent damage during an event. The secondary effect of flooding can be addressed through decreasing runoff and water velocity. Important issues associated with severe weather in the San Mateo County Planning Area include the following:

- Redundancy of power supply throughout the Planning Area must be evaluated to better understand what areas may be vulnerable.
Although primarily thought of as an urban area, the County has a larger physical land mass containing rural communities and must also consider the needs of these residents (as well as their possible isolation during storm events).

Public education on dealing with the impacts of severe weather needs to continue to be provided so that citizens can be better informed and prepared for severe weather events. In particular, fog should be considered, since fog may be downplayed despite its potential for transportation accidents.

Debris management (downed trees, etc.) must be addressed, because debris can impact the severity of severe weather events, requires coordination efforts, and may require additional funding.

The effects of climate change may result in an increase of heavy rain or more intense storm events, and will likely lead to increased temperatures and changes in overall precipitation amounts.

Older building stock in the Planning Area is built to low code standards or none at all. These structures could be highly vulnerable to severe winter weather effects.

Urban forest management programs should be evaluated to help reduce impacts from forest-related damages.
9.1 General Background

A tsunami consists of a series of high-energy waves that radiate outward like ripples in a pond from an area where a generating event occurs. The waves arrive at the shore over an extended period.

Tsunamis are typically classified as local or distant. The warning time for a locally generated tsunami is minimal, leaving few options except to seek high ground. They may be accompanied by damage from the triggering earthquake caused by ground shaking, surface faulting, liquefaction, or landslides. Distant tsunamis may travel for hours before they strike a coastline, giving a community a longer chance to implement evacuation plans.

In the open ocean, a tsunami may be only a few inches or a few feet high, but it can travel with speeds approaching 500 miles per hour. As a tsunami enters the shoaling waters near a coastline, its speed diminishes, its wavelength decreases, and its height increases greatly. The first wave usually is not the largest. Several larger and more destructive waves often follow the first one. As tsunamis reach the shoreline, they may take the form of a fast-rising tide, a cresting wave, or a bore (a large, turbulent wall-like wave). The bore phenomenon resembles a step-like change in the water level that advances rapidly (from 10 to 60 miles per hour).

The configuration of the coastline, the shape of the ocean floor, and the characteristics of advancing waves play important roles in the destructiveness of the waves. Offshore canyons can focus tsunami wave energy, and islands can filter the energy. The orientation of the coastline determines whether the waves strike head-on or are refracted from other parts of the coastline. A wave may be small at one point on a coast and much larger at other points. Bays, sounds, inlets, rivers, streams, offshore canyons, islands, and flood control channels may cause various effects that alter the level of damage. It has been estimated, for example, that a tsunami wave entering a flood control channel could reach a mile or more inland, especially if it enters at high tide.

The first visible indication of an approaching tsunami may be recession of water (drawdown) caused by the trough preceding the advancing, large inbound wave crest. Rapid drawdown can create strong currents in harbor inlets and channels that can severely damage coastal structures through erosive scour around piers and pilings. As the water’s surface drops, piers can be damaged by boats or ships straining at or breaking their mooring lines. The vessels can overturn or sink because of the strong currents, collisions with other objects, or impact with the harbor bottom.

DEFINITIONS

Tsunami—A series of traveling ocean waves of extremely long wavelength, usually caused by displacement of the ocean floor and typically generated by seismic or volcanic activity or by underwater landslides.

Seiches—A standing wave/oscillation in an enclosed or partially enclosed body of water that varies in period from a few minutes to several hours.
Conversely, the first indication of a tsunami may be a rise in water level. The advancing tsunami may initially resemble a strong surge that increases the sea level like the rising tide, but the tsunami surge rises faster and often does not break as a normal wave. Additionally, this surge of water does not stop at the shoreline and pushes above normal sea level tidal reach. This phenomenon is called “run-up” (see Figure 9-1).

Even if the run up appears to be small — 3 to 6 feet, for example – the strength of the accompanying surge can be deadly. Waist-high surges can cause strong currents that float cars, small structures, and other debris. Boats and debris are often carried inland by the surge and left stranded when the water recedes.

![Diagram of tsunami](image)

**Figure 9-1. Run-up Distance and Height in Relation to the Datum and Shoreline**

The advancing turbulent front will be the most destructive part of the tsunami at some locations. In other situations, the greatest damage will be caused by the outflow of water back to the sea between crests, sweeping all before it and undermining roads, buildings, bulkheads, and other structures. This outflow action can carry enormous amounts of highly damaging debris, resulting in further destruction. Ships and boats, unless moved away from shore, may be dashed against breakwaters, wharves, and other craft, or be washed ashore and left grounded after the seawater withdraws.

Typical signs of a tsunami hazard are earthquakes and a sudden and unexpected rise or fall in coastal water. The large waves are often preceded by coastal flooding and followed by a quick recession of the water. Tsunamis are difficult to detect in the open ocean because waves are often less than 3 feet high. The tsunami’s size and speed, as well as the coastal area’s form and depth, affect the impact of a tsunami; wave heights of 50 feet are not uncommon. In general, scientists believe it requires an earthquake of at least a magnitude 7 to produce a tsunami.
9.2 Hazard Profile

9.2.1 Past Events

More than 80 tsunamis have been recorded or observed in California, according to state records; however, many of these events were small and led to little or no damage. All tsunamis from the past century have been distant, not local. That is, they have all resulted from earthquakes far across the Pacific basin (as opposed to earthquakes near the American coastline). The most noteworthy tsunamis in California include:

- **January 26, 1700 (Local Tsunami)** – An estimated M-9 earthquake ruptured the entire length of the Cascadia Subduction Zone, causing tsunami waves up to 50 feet in parts of northern California. Scientists have reconstructed the event from geologic evidence and oral Native American histories, as well as Japanese documents describing a tsunami that hit Japan’s coastline that same day.

- **December 21, 1812 (Local Tsunami)** – A tsunami struck the Santa Barbara and Ventura coastlines not long after an earthquake was felt in the area. The tsunami inundated lowland areas and damaged local ships. Some debate exists as to whether the tsunami was earthquake-induced or the result of a submarine landslide triggered by the earthquake.

- **April 1, 1946 (Distant Tsunami)** – An M-8.8 earthquake in the Aleutian Islands generated a tsunami that caused damage along the coast of California, including flooding more than 1,000 feet inland in Half Moon Bay.

- **March 28, 1964 (Distant Tsunami)** – An M-9.2 earthquake in Anchorage, Alaska, generated a tsunami that struck the Pacific Northwest and northern California. Twelve people were killed in California, and a surge approximately 20-feet high flooded 29 city blocks of Crescent City.

- **March 11, 2011 (Distant Tsunami)** – An M-9.0 earthquake in Tohuku, Japan generated a moderate tsunami in California. While the tsunami did not cause significant flooding, it did lead to one death and more than $100 million in damages to 27 harbors statewide. The most significant damage occurred in Crescent City and Santa Cruz.

While the list above includes only major tsunamis in California, San Mateo County has been struck by minor tsunamis as well. The table below lists known tsunami events that have struck the County or one of its jurisdictions since 1859. The California Department of Conservation maintains a list of tsunamis in the state, including San Francisco or other Bay Area entities. Some tsunamis have struck San Francisco or other parts of the Bay Area but not San Mateo County; those events were not identified in the list below.
<table>
<thead>
<tr>
<th>Date(s) of Event</th>
<th>Event Type</th>
<th>FEMA Declaration Number (if applicable)</th>
<th>San Mateo County Designated?</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 24, 1859</td>
<td>Local Tsunami</td>
<td>N/A</td>
<td>N/A</td>
<td>A tsunami originating in Northern California hit Half Moon Bay, with waves 4.6 meters high.</td>
</tr>
<tr>
<td>April 1, 1946</td>
<td>Distant Tsunami</td>
<td>N/A</td>
<td>N/A</td>
<td>An M-7.3 earthquake in the East Aleutian Islands (Alaska) triggered a tsunami that struck California. Wave heights of 2.6 meters were recorded in Half Moon Bay.</td>
</tr>
<tr>
<td>May 22, 1960</td>
<td>Distant Tsunami</td>
<td>N/A</td>
<td>N/A</td>
<td>An M-9.5 earthquake in Central Chile triggered a tsunami that reached San Mateo County. Wave heights of 1.2 meters were recorded in Pacifica.</td>
</tr>
<tr>
<td>March 28, 1964</td>
<td>Distant Tsunami</td>
<td>N/A</td>
<td>N/A</td>
<td>An M-9.2 earthquake off the Gulf of Alaska triggered a tsunami that reached San Mateo County. Wave heights of 1.4 meters were recorded in Pacifica. The tsunami arrived in San Francisco 5 hours and 6 minutes after the triggering event.</td>
</tr>
<tr>
<td>February 27, 2010</td>
<td>Distant Tsunami</td>
<td>N/A</td>
<td>N/A</td>
<td>An M-8.8 earthquake in Central Chile triggered a tsunami that reached San Mateo County. Wave heights of 0.6 meter were recorded in Half Moon Bay.</td>
</tr>
<tr>
<td>March 11, 2011</td>
<td>Distant Tsunami</td>
<td>DR-1968</td>
<td>No</td>
<td>At 10:46 p.m. on March 10, 2011, a magnitude 8.9 earthquake struck near the coast of Honshu, Japan. The earthquake generated a tsunami significantly affecting California on March 11, 2011. Wave heights of 0.7 meter were recorded in Half Moon Bay, 1 meter in Pacifica, and 0.12 meter in Redwood City. A preliminary damage assessment was conducted during the response, but no physical damage reported. Ultimately, however, the tsunami damaged six boat slips, three docks, and snapped a wooden piling at the Berkeley Marina.</td>
</tr>
</tbody>
</table>

Sources: FEMA 2016, NOAA NDCD 2016, California Department of Conservation 2016
9.2.2 Location

The earth’s surface is made up of a number of crustal plates that contain large sections of the continents and ocean basins. These plates may pull apart from, slide past, override, or under-ride (“subduct”) one another. Plate boundaries coincide with faults that produce earthquakes as stress accumulated from the relative movement of the plates is relieved. The earthquakes, in turn, may produce displacements of the sea floor that can set the overlying column of water in motion, initiating a tsunami. However, not all submarine earthquakes produce tsunamis. It depends on the magnitude of the earthquake and type of faulting that has occurred.

The most active plate boundaries rim the Pacific Ocean and the Caribbean Sea. Consequently, these areas are where most tsunami activity is expected. Most tsunamis originate in the Pacific “Ring of Fire,” which is the most active seismic region on earth. An estimated 489 cities in Alaska, California, Hawaii, Oregon, and Washington are susceptible to tsunamis. As many as 900,000 residents of these cities could be inundated by a 50-foot tsunami. In addition, millions of tourist that visit these regions each year could be affected by tsunami events along the Pacific coast.

Tsunamis affecting San Mateo County may be induced by geologic events of local origin or earthquakes at considerable distances, such as in Alaska or South America. Most tsunamis originate in the Pacific Ocean, where tsunami waves triggered by seismic activity can travel at up to 500 miles per hour, striking distant coastal areas in a matter of hours (see Figure 9-22).

![Figure 9-2. Potential Tsunami Travel Times in the Pacific Ocean](image)
According to a document titled *U.S. States and Territories National Tsunami Hazard Assessment: Historical Record and Sources for Waves—Update*, California as a whole is classified as a “Very High” hazard area according to run-up height, run-up frequency, and qualitative tsunami hazard assessments based on historical record. Additionally, California has experienced more tsunami-caused fatalities than either Oregon or Washington, although it is not the state or territory with the highest number of tsunami-caused fatalities in the country (Dunbar and Weaver 2015).

The California Department of Conservation maintains detailed tsunami inundation maps for San Mateo County and other parts of the State. Maps for relevant communities are available on their website at: [http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/SanMateo](http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/SanMateo). These maps are generated through computer modeling of the areas most likely to be affected by a tsunami event and serve as an important preparedness tool. The tsunami hazard areas identified in the mapping are based on a suite of tsunami sources, both local and distant, and does not, therefore, represent risk from a single sources event. Tsunami risk areas are shown in Figure 9-3.

![Figure 9-3. Tsunami Risk Areas for San Mateo County](image-url)
9.2.3 Frequency

The frequency of tsunamis is related to the frequency of the events that cause them, so it is similar to the frequency of seismic or volcanic activities or landslides. Generally, four or five tsunamis occur every year in the Pacific Basin, and those that are most damaging are generated in the Pacific waters off South America rather than in the northern Pacific.

Based on risk factors for the County and past occurrences, it is highly likely that tsunamis will continue to strike the coastline in San Mateo County. Tsunami probabilities are tied to earthquake and other geologic events; however, not all earthquakes or submarine landslides will trigger a tsunami.

9.2.4 Severity

The National Oceanic and Atmospheric Administration (NOAA) issues tsunami warnings in the United States and has two Tsunami Warning Centers: the West Coast and Alaska Tsunami Warning Center (WC/ATWC) located in Palmer, Alaska and the Pacific Tsunami Warning Center (PTWC) located in Ewa Beach, Hawaii. WC/ATWC issues information to all states except Hawaii, U.S. territories in the Caribbean, and Canada. PTWC is responsible for Hawaii, U.S. territories in the Pacific, and international recipients in the Pacific and Indian Oceans, and the Caribbean Sea.

The warning centers monitor a worldwide network of seismic and sea level stations, providing the basis for tsunami warnings, advisories, watches, and information statements. There are four types of tsunami messages issued by the warning centers and are as follows:

- Warnings are initially based solely on seismic data and are issued as quickly as possible indicating that a significant inundation may occur. They can be cancelled or downgraded to an advisory.
- Advisories indicate potential beach and harbor danger caused by strong currents; however, significant widespread inundation is not expected.
- Watches indicate that a potentially dangerous distant event has occurred and the area needs to be alert for more information (NOAA 2016)

9.2.5 Warning Time

The Pacific Tsunami Warning System evolved from a program initiated in 1946. It is a cooperative effort involving 26 countries along with numerous seismic stations, water level stations, and information distribution centers. Both the WC/ATWC and PTWC participate in the warning system, along with the Ewa Beach Center, which serves as an administrative hub for the Pacific Tsunami Warning System.

The warning system begins to function only when a Pacific basin earthquake of magnitude 6.5 or greater triggers an earthquake alarm. When this earthquake is registered, the following sequence of actions occurs:

- Data are interpolated to identify the epicenter and magnitude of the event.
- If the event is magnitude 7.5 or greater and located at sea, a TSUNAMI WATCH is issued.
- Participating tide stations in the earthquake area are requested to monitor their gages. If unusual tide levels are noted, the tsunami watch is upgraded to a TSUNAMI WARNING.
- Tsunami travel times are calculated, and the warning is transmitted to the disseminating agencies and thus relayed to the public.
- The Ewa Beach center will cancel the watch or warning if reports from the stations indicate that no tsunami was generated or that the tsunami was inconsequential.

This system is not considered effective for communities located close to the tsunami because the first wave would arrive before the data were processed and analyzed. In this case, strong ground shaking would provide the first warning of a potential tsunami.

In addition, NOAA, as part of the U.S. National Tsunami Hazard Mitigation Program, implemented the Deep-ocean Assessment and Reporting of Tsunami (DART) project to ensure detection of tsunamis and to acquire data critical to real-time forecasts. DART systems consist of an anchored seafloor bottom pressure recorder (BPR) and a companion moored surface buoy for real-time communications. An acoustic link transmits data from the BPR on the seafloor to the surface buoy. The surface buoy then delivers data to the national Weather Service Telecommunications Gateway that then distributes the data in real-time to the Tsunami Warning Centers. Figure 9-4 depicts the operation of the DART System (NOAA 2011).
9.3 Secondary Hazards

Floating debris carried by a tsunami can endanger human lives and batter inland structures. Ships moored at piers and in harbors often are swamped and sunk or are left battered and stranded high on the shore. Breakwaters and piers collapse, sometimes because of scouring actions that sweep away their foundation material and sometimes because of the sheer impact of the waves.

Port facilities, naval facilities, fishing fleets, and public utilities are often the backbone of the economy of the affected areas, and these resources generally receive the most severe damage. Until debris can be cleared, wharves and piers rebuilt, utilities restored, and fishing fleets reconstituted, communities may find themselves without fuel, food, and employment. Wherever water transport is a vital means of supply, disruption of coastal systems caused by tsunamis can have far-reaching economic effects.

Another potential secondary hazard from tsunamis includes seiches. Seiches are standing waves oscillating in a body of water, and they can form in any enclosed or semi-enclosed body of water, including the San Francisco Bay. They typically result from strong winds and rapid changes in atmosphere pressure, which push the water from one end of the enclosure to the other. When the wind stops, the water rebounds to the other side and then continues to oscillate for hours or days. Tsunamis, earthquakes, and severe storm fronts can also cause seiches. The destructive potential associated with seiches is exemplified through one from 1844, where a 22-foot seiche in Lake Erie breached a 14-foot sea wall, killed 78 people, and dammed the ice to the extent that the Niagara Falls temporarily stopped flowing (NOAA 2015). While seiches are not as common in the San Francisco Bay as they are in the Great Lakes, bayside communities should still be mindful of this potential hazard and recommend residents avoid close proximity to the bay for several days after a tsunami.

Run-up is another secondary hazard that should be monitored by bayside and oceanside residents after a tsunami. Discussed earlier in this profile, the force associated with run-up can move cars, small structures, and debris, presenting risks to both life safety and property.

9.4 Exposure

The Level 2 (user-defined) HAZUS-MH protocol was used to assess the risk and vulnerability to tsunamis in the planning area. The model used census data at the block level and State of California tsunami inundation mapping, which has a level of accuracy acceptable for planning purposes. Where possible, the HAZUS-MH default data were enhanced using local geographic information system (GIS) data from county, state, and federal sources. It should be noted that the tsunami mapping used as the basis for this assessment combines risk from a variety of sources and is not representative of a single scenario event. It is unlikely that all areas shown as at risk would be inundated from any single tsunami event.

9.4.1 Population

The population living in tsunami hazard areas was estimated using the percent of residential buildings within the tsunami hazard area for each jurisdiction multiplied by the total estimated population for the jurisdiction. Using this approach, the estimated resident population living in tsunami hazard areas is 4,282 or less than 1.
percent of the population. The populations that would be most exposed to this type of hazard are those along beaches, low-lying coastal areas, tidal flats, and stream deltas that empty into ocean-going waters. People recreating in these areas would also be exposed. Table 9-2 shows the estimated population exposure by jurisdiction.

<table>
<thead>
<tr>
<th>Table 9-2. Estimated Population Exposure for Tsunami Hazard Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population Exposed</strong></td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Atherton</td>
</tr>
<tr>
<td>Belmont</td>
</tr>
<tr>
<td>Brisbane</td>
</tr>
<tr>
<td>Burlingame</td>
</tr>
<tr>
<td>Colma</td>
</tr>
<tr>
<td>Daly City</td>
</tr>
<tr>
<td>East Palo Alto</td>
</tr>
<tr>
<td>Foster City</td>
</tr>
<tr>
<td>Half Moon Bay</td>
</tr>
<tr>
<td>Hillsborough</td>
</tr>
<tr>
<td>Menlo Park</td>
</tr>
<tr>
<td>Millbrae</td>
</tr>
<tr>
<td>Pacifica</td>
</tr>
<tr>
<td>Portola Valley</td>
</tr>
<tr>
<td>Redwood City</td>
</tr>
<tr>
<td>San Bruno</td>
</tr>
<tr>
<td>San Carlos</td>
</tr>
<tr>
<td>San Mateo</td>
</tr>
<tr>
<td>South San Francisco</td>
</tr>
<tr>
<td>Woodside</td>
</tr>
<tr>
<td>Unincorporated</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

### 9.4.2 Property

**Present Land Use in the Tsunami Hazard Area**

Table 6-53 summarizes present land use based on structure type in the tsunami hazard area by jurisdiction. Spatial analysis concluded that there are 1,469 structures within the hazard areas and that 88 percent of these structures (1,287) are thought to be residential.
TABLE 9-3. STRUCTURE TYPE IN TSUNAMI HAZARD AREAS

<table>
<thead>
<tr>
<th></th>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Agriculture/Forestry</th>
<th>Religion</th>
<th>Government</th>
<th>Education</th>
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<tr>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
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<td>Foster City</td>
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</tr>
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<td>Portola Valley</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
</tr>
<tr>
<td>Redwood City</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>San Bruno</td>
<td>0</td>
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<td>0</td>
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<td>0</td>
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</tr>
<tr>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Woodside</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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</tr>
<tr>
<td>Unincorporated</td>
<td>256</td>
<td>100</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>377</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,287</strong></td>
<td><strong>156</strong></td>
<td><strong>24</strong></td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td><strong>1,469</strong></td>
</tr>
</tbody>
</table>

a. Structure type assigned to best fit HAZUS occupancy classes based on present use classifications provided by San Mateo County assessor’s data. Where conflicting information was present in the available data, parcels were assumed to be improved.

Exposed Value

Table 6-64 summarizes the estimated value of exposed buildings to the tsunami hazard in the planning area. This methodology estimated $5.7 billion worth of building-and-contents exposed to the tsunami hazard, representing 1.8 percent of the total replacement value of the planning area.
### TABLE 9-4. VALUE OF STRUCTURES IN THE TSUNAMI HAZARD AREA

<table>
<thead>
<tr>
<th>Structure</th>
<th>Value Exposed Contents</th>
<th>Total</th>
<th>% of Total Replacement value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Belmont</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Brisbane</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Burlingame</td>
<td>$82,504,201</td>
<td>$50,594,412</td>
<td>$133,098,612</td>
</tr>
<tr>
<td>Colma</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Daly City</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>$18,684,623</td>
<td>$18,684,623</td>
<td>$37,369,245</td>
</tr>
<tr>
<td>Foster City</td>
<td>$0</td>
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<td>$0</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>$1,458,177,273</td>
<td>$738,037,040</td>
<td>$2,196,214,313</td>
</tr>
<tr>
<td>Hillsborough</td>
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<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Millbrae</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Pacifica</td>
<td>$594,836,756</td>
<td>$485,014,320</td>
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<tr>
<td>Portola Valley</td>
<td>$0</td>
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<td>$0</td>
</tr>
<tr>
<td>Redwood City</td>
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<td>$36,015,938</td>
<td>$66,444,293</td>
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<tr>
<td>San Bruno</td>
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<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>San Carlos</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>San Mateo</td>
<td>$3,814,080</td>
<td>$3,814,080</td>
<td>$7,628,160</td>
</tr>
<tr>
<td>South San Francisco</td>
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<tr>
<td>Woodside</td>
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<td>$0</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>$837,935,571</td>
<td>$772,564,676</td>
<td>$1,610,500,248</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$3,307,805,409</strong></td>
<td><strong>$2,466,481,620</strong></td>
<td><strong>$5,774,287,028</strong></td>
</tr>
</tbody>
</table>

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

### 9.4.3 Critical Facilities

Critical facilities in the tsunami hazard areas are summarized in Table 9-5. Details are provided in the following sections.

### TABLE 9-5. CRITICAL FACILITIES IN TSUNAMI HAZARD AREAS

<table>
<thead>
<tr>
<th>Medical and Health Services</th>
<th>Emergency Services</th>
<th>Government</th>
<th>Utilities</th>
<th>Transportation Infrastructure</th>
<th>Hazardous Materials</th>
<th>Community Economic Facilities</th>
<th>Other Assets</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>Belmont</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
**TABLE 9-5. CRITICAL FACILITIES IN TSUNAMI HAZARD AREAS**

<table>
<thead>
<tr>
<th>Facility</th>
<th>Medical and Health Services</th>
<th>Emergency Services</th>
<th>Government</th>
<th>Utilities</th>
<th>Transportation Infrastructure</th>
<th>Hazardous Materials</th>
<th>Community Economic Facilities</th>
<th>Other Assets</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brisbane</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Burlingame</td>
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<td>0</td>
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<td>0</td>
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</tr>
<tr>
<td>Colma</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
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<td>Half Moon Bay</td>
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<tr>
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<tr>
<td>Menlo Park</td>
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<td>0</td>
<td>0</td>
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</tr>
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</tr>
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<tr>
<td>Redwood City</td>
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<td>0</td>
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<td>0</td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>San Mateo</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
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<td>3</td>
</tr>
<tr>
<td>Woodside</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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<td><strong>1</strong></td>
<td><strong>0</strong></td>
<td><strong>13</strong></td>
<td><strong>16</strong></td>
<td><strong>2</strong></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
<td><strong>32</strong></td>
</tr>
</tbody>
</table>

**Hazardous Material Facilities**

The planning area includes 2 structures in the tsunami hazard areas that contain hazardous materials. Containers holding these materials can rupture and leak into the surrounding area during a tsunami event, having a disastrous effect on the environment as well as residents.

**Roads**

Roads that are blocked or damaged can prevent access throughout the planning area and can isolate residents and emergency service providers needing to reach vulnerable populations or to make repairs. Roads are an important component in the management of tsunami-related emergencies in that they act as the primary resource for evacuation to higher ground before and during a tsunami event. Roads often act as flood control facilities in low-depth, low-velocity flood events by acting as levees or berms and diverting or containing floodwaters.
flows. Geospatial analysis indicates the following major roads pass through the tsunami inundation areas and may be exposed to the tsunami hazard:

- State Highway 1
- State Highway 92
- US Highway 101

This list of roads should not be misinterpreted as possible evacuation routes for tsunami events. Evacuation routes are identified in emergency response plans.

**Bridges**

Bridges exposed to tsunami events can be extremely vulnerable because of the forces transmitted by the wave run-up and by the impact of debris carried by the wave action. Geospatial analysis identified 11 bridges that would be exposed to the tsunami hazard.

**Water/Sewer/Utilities**

Water and sewer systems can be affected by the flooding associated with tsunami events. Floodwaters can back up drainage systems, causing localized flooding. Culverts can be blocked by debris from flood events, also causing localized urban flooding. Floodwaters can enter drinking water supplies, causing contamination. Sewer systems can be backed up, causing wastes to spill into homes, neighborhoods, rivers and streams. The forces of tsunami waves can damage aboveground utilities by knocking down power lines and radio/cellular communication towers. Power generation facilities can be severely impaired by both the impact of the wave action and the inundation of floodwaters.

**9.5 Vulnerability**

**9.5.1 Population**

The populations most vulnerable to the tsunami hazard are the elderly, disabled, and very young who reside or recreate near beaches, low-lying coastal areas, tidal flats, and stream or river deltas that empty into ocean-going waters. In addition, visitors recreating in or around inundation areas would also be vulnerable, as they may not be as familiar with residents or appropriate responses to a tsunami or ways to reach higher ground. There would be little warning time in the event of a local tsunami generated in or near San Mateo County or the Bay Area (as opposed to a Cascadia earthquake-induced tsunami), so more of the population would be vulnerable. The degree of vulnerability of the population exposed to the tsunami hazard event is based on a number of factors:

- Is there a warning system?
- What is the lead time of the warning?
- What is the method of warning dissemination?
- Will the people evacuate when warned?

Table 9-6 summarizes estimated impacts on persons in the planning area for a tsunami event.
### Table 9-6. Estimated Tsunami Impact on Persons

<table>
<thead>
<tr>
<th></th>
<th>Displaced Persons a</th>
<th>Persons Requiring Short-Term Shelter b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
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<td>0</td>
</tr>
<tr>
<td>Belmont</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Burlingame</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Colma</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Daly City</td>
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<td>0</td>
</tr>
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<tr>
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</tr>
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<td>San Bruno</td>
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</tr>
<tr>
<td>San Carlos</td>
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<td>South San Francisco</td>
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</tr>
<tr>
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<td>298</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,955</td>
<td>1,800</td>
</tr>
</tbody>
</table>

a. HAZUS-MH results in this table are not intended to be precise estimates of damage after a hazard event. They represent generalized estimates of damage that may occur as the result of the modeled scenario, based on the available data.

b. Calculated using a census block level, general building stock analysis and adjusted to reflect the estimated population.

#### 9.5.2 Property

**Structural and Non-Structural Loss**

All structures along beaches, low-lying coastal areas, tidal flats, and stream or river deltas would be vulnerable to a tsunami, especially in an event with little or no warning time. The impact of the waves and the scouring associated with debris that may be carried in the water could be damaging to structures in the tsunami’s path. Those that would be most vulnerable are located in the front line of tsunami impact and those that are not structurally sound.

HAZUS-MH was modified to calculate tsunami losses to structures based on flooding depth and structure type. It is estimated that there could be more than $879 million of loss from the tsunami hazard in the planning area. This amount represents 15 percent of the total exposure to the tsunami hazard and less than 1 percent of the total replacement value for the planning area. The analysis is summarized in Table 9-7.
### Table 9-7. Loss Estimates for Tsunami Hazard

<table>
<thead>
<tr>
<th>Structures Impacted&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Estimated Loss Associated with Tsunami&lt;sup&gt;a&lt;/sup&gt;</th>
<th>% of Total Replacement value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Structure</td>
<td>Contents</td>
</tr>
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<tr>
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<td>$0</td>
</tr>
<tr>
<td>Brisbane</td>
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<td>$0</td>
</tr>
<tr>
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<td>$132,028</td>
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<td>$0</td>
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<tr>
<td>Daly City</td>
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<td>$0</td>
</tr>
<tr>
<td>East Palo Alto</td>
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<td>$0</td>
</tr>
<tr>
<td>Foster City</td>
<td>0</td>
<td>$0</td>
</tr>
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<td>$0</td>
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<tr>
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<td>$0</td>
</tr>
<tr>
<td>Millbrae</td>
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<td>$0</td>
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</tr>
<tr>
<td>Unincorporated</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>786</strong></td>
<td><strong>$295,051,535</strong></td>
</tr>
</tbody>
</table>

---

<sup>a</sup> The hazard risk areas are derived from several potential source events. It is not likely that all areas would be inundated by any single tsunami event.

<sup>b</sup> Impacted structures are those structures with finished floor elevations below the tsunami water surface elevation. These structures are the most likely to receive significant damage in a tsunami event.

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

---

**Tsunami-Caused Debris**

The HAZUS-MH analysis estimated the amount of tsunami-caused debris in the planning area for the tsunami hazard, as summarized in Table 9-8.
### Table 9-8. Estimated Tsunami-Caused Debris\(^a\)

<table>
<thead>
<tr>
<th></th>
<th>Debris to Be Removed (tons)(^b)</th>
<th>Estimated Number of Truckloads (^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherton</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Belmont</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Brisbane</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Burlingame</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Colma</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Daly City</td>
<td>1,066</td>
<td>43</td>
</tr>
<tr>
<td>East Palo Alto</td>
<td>205</td>
<td>8</td>
</tr>
<tr>
<td>Foster City</td>
<td>59</td>
<td>2</td>
</tr>
<tr>
<td>Half Moon Bay</td>
<td>57,598</td>
<td>2,304</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Millbrae</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pacifica</td>
<td>15,544</td>
<td>622</td>
</tr>
<tr>
<td>Portola Valley</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Redwood City</td>
<td>3,189</td>
<td>128</td>
</tr>
<tr>
<td>San Bruno</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>San Carlos</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>San Mateo</td>
<td>85</td>
<td>3</td>
</tr>
<tr>
<td>South San Francisco</td>
<td>1,227</td>
<td>49</td>
</tr>
<tr>
<td>Woodside</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unincorporated</td>
<td>134,061</td>
<td>5,362</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>213,033</strong></td>
<td><strong>8,521</strong></td>
</tr>
</tbody>
</table>

\(a\) The hazard risk areas are derived from several potential source events. It is not likely that all areas would be inundated by any single tsunami event.

\(b\) Debris generation estimates were based on updated general building stock dataset at a Census Block analysis level.

\(c\) HAZUS-MH assumes 25 tons/trucks

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

### 9.5.3 Critical Facilities

HAZUS-MH was used to estimate potential tsunami damage to critical facilities exposed to the tsunami hazard. Using depth/damage function curves to estimate the percent of damage to the building and contents of critical facilities, HAZUS-MH correlates these estimates into an estimate of functional down-time (the estimated time it will take to restore a facility to 100 percent of its functionality). This estimate helps to gauge how long the usage of facilities deemed critical to response and recovery would be limited in the planning area. The HAZUS critical facility results are shown in Table 9. On average, critical facilities would receive 3.71 percent damage to the structure and 0 percent damage to the contents.
TABLE 9-9. ESTIMATED DAMAGE TO CRITICAL FACILITIES AND INFRASTRUCTURE FROM THE TSUNAMI HAZARD

<table>
<thead>
<tr>
<th>Number of Facilities Affected</th>
<th>Average % of Total Value Damaged</th>
<th>Days to 100% Functionality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Building</td>
<td>Content</td>
</tr>
<tr>
<td>Medical and Health Services</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Emergency Services</td>
<td>1</td>
<td>0.0</td>
</tr>
<tr>
<td>Government</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Utilities</td>
<td>13</td>
<td>0.0</td>
</tr>
<tr>
<td>Transportation Infrastructure</td>
<td>16</td>
<td>1.31</td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>2</td>
<td>16.33</td>
</tr>
<tr>
<td>Community Economic Facilities</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Other Assets</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32</strong></td>
<td><strong>3.71</strong></td>
</tr>
</tbody>
</table>

a. The hazard risk areas are derived from several potential source events. It is not likely that all areas would be inundated by any single tsunami event.

9.5.4 Environment

The environment vulnerable to the tsunami hazard is the same as the environment exposed to the hazard. A tsunami event has the potential to alter the shoreline, depending on the force of the run-up. In addition to these changes, vegetation and wildlife habitats may be damaged or destroyed, and soil and sediment runoff will accumulate downslope, potentially blocking waterways and roadways and impairing the quality of streams and other water bodies.

Most environmental and ecological impacts from tsunamis derive from direct damage from the waves, which can physically remove vegetation and wildlife, increase sediment load, and smother vegetation that isn’t physically carried away. While not a concern in San Mateo County, tsunami destruction of coral reefs can be a concern. The specific physical damage from waves frequently depends on the local topography and hydrology.

Other environmental impacts from tsunamis include chemical changes from saltwater intruding into freshwater sources; eutrophication (enrichment) of water from increased runoff; raw sewage; and decomposition of vegetation, wildlife, rotting property (boats or buildings) and unrecovered remains. Non-biodegradable waste, such as plastics, can also lead to a buildup in marine debris, and toxic wastes, if previously inadequately stored, may be released into the environment. Lastly, exotic wildlife may be introduced or may escape into the local ecosystem.

9.5.5 Economic Impact

Economic impact will be largely associated with the location where the tsunami occurred. In such areas, commercial buildings may be destroyed or severely damaged, disrupting associated services.
9.6 Future Trends in Development

The County and its planning partners are equipped to handle future growth within tsunami inundation areas. The inundation maps provided by the California Department of Conservation offer jurisdictions a way to guide development away from tsunami-prone areas. Additionally, all partners have committed to integrating their general plans to this hazard mitigation plan. By coordinating their general plans, municipalities and the County will be better able to make wise land use decisions as future growth impacts tsunami hazard areas.

### Table 9.10. Future Land Use Exposed to the Tsunami Hazard

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Agriculture/Resource Extraction</th>
<th>Commercial</th>
<th>Education</th>
<th>Industrial</th>
<th>Mixed Use</th>
<th>Other/Unknown</th>
<th>Parks/Open Space</th>
<th>Residential</th>
<th>Water</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
<td>Area (acres)</td>
<td>% of Total</td>
</tr>
<tr>
<td>AHERTON</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>BELMONT</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>BRISBANE</td>
<td>0.0</td>
<td>0.00%</td>
<td>4.4</td>
<td>13.70%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>BURLINGAME</td>
<td>0.0</td>
<td>0.00%</td>
<td>19.0</td>
<td>17.24%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>COLMA</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>DALY CITY</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>EAST PALO ALTO</td>
<td>0.0</td>
<td>0.01%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>2.0</td>
<td>0.85%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>FOSTER CITY</td>
<td>0.0</td>
<td>0.00%</td>
<td>41.7</td>
<td>16.90%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>HALF MOON BAY</td>
<td>0.0</td>
<td>0.00%</td>
<td>15.9</td>
<td>4.72%</td>
<td>0.0</td>
<td>0.00%</td>
<td>7.1</td>
<td>2.09%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>HILLSBOROUGH</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>MENLO PARK</td>
<td>161.9</td>
<td>38.07%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>10.4</td>
<td>2.46%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>MILLBRAE</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>7.4</td>
<td>62.12%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>PACIFICA</td>
<td>0.0</td>
<td>0.00%</td>
<td>51.8</td>
<td>11.49%</td>
<td>14.3</td>
<td>3.17%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>PORTOLA VALLEY</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>REDWOOD CITY</td>
<td>0.0</td>
<td>0.00%</td>
<td>7.5</td>
<td>0.14%</td>
<td>0.2</td>
<td>0.00%</td>
<td>9.2</td>
<td>0.17%</td>
<td>10.4</td>
<td>0.20%</td>
</tr>
<tr>
<td>SAN BRUNO</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>SAN CARLOS</td>
<td>0.0</td>
<td>0.00%</td>
<td>3.4</td>
<td>1.75%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>SAN MATEO</td>
<td>0.0</td>
<td>0.00%</td>
<td>70.5</td>
<td>33.64%</td>
<td>0.0</td>
<td>0.00%</td>
<td>23.2</td>
<td>11.10%</td>
<td>1.3</td>
<td>0.64%</td>
</tr>
<tr>
<td>SOUTH SAN FRANCISCO</td>
<td>0.0</td>
<td>0.00%</td>
<td>44.7</td>
<td>2.34%</td>
<td>1.6</td>
<td>0.08%</td>
<td>79.6</td>
<td>4.17%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>WOODSIDE</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td>UNINCORPORATED</td>
<td>227.3</td>
<td>11.90%</td>
<td>44.7</td>
<td>2.34%</td>
<td>1.6</td>
<td>0.08%</td>
<td>79.6</td>
<td>4.17%</td>
<td>0.0</td>
<td>0.00%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>389.3</td>
<td>4.09%</td>
<td>258.9</td>
<td>2.72%</td>
<td>23.2</td>
<td>0.24%</td>
<td>131.8</td>
<td>1.39%</td>
<td>11.7</td>
<td>0.12%</td>
</tr>
</tbody>
</table>
9.7 Scenario

A tsunami in San Mateo County can be generated by either a nearby or distant earthquake or a submarine landslide. The worst-case scenario involves a local tsunami generated by an earthquake in the Cascadia subduction zone or by an earthquake or earthquake-induced landslide along the San Andreas Fault. A professor at the University of California Santa Cruz has developed a projection where the incoming waves of such a tsunami (in this case, originating from an earthquake in the Cascadia subduction zone) are more than 16 feet. In these simulations, the tsunami would flood outlying and low-lying portions of the Bay Area, spreading out through San Francisco Bay. Significant flooding, property damage, and potential injuries and fatalities would result. Such a tsunami would probably be very damaging, although its travel time should ensure residents would have several hours to prepare and follow local evacuation guides. Additionally, while a worst-case scenario, experts agree that it has an extremely low probability of occurrence (Varner 2015).

The most likely tsunami event to strike San Mateo County would be a distant earthquake near Alaska or Chile generating a tsunami with wave heights of 1 to 2 meters reaching Half Moon Bay or Pacifica.

9.8 Issues

The planning team has identified the following issues related to the tsunami hazard for the planning area:

- **Hazard Identification**—To truly measure and evaluate the probable impacts of tsunamis on planning, hazard mapping based on probabilistic scenarios must continue to be updated regularly. The science and technology in this field are emerging. Accurate probabilistic tsunami mapping will need to be a key component for tsunami hazard mitigation programs to be effective.

- **Building Code Revisions**—Present building codes and guidelines do not adequately address the impacts of tsunamis on structures. Planning partners, especially the Cities of Half Moon Bay and Pacifica, should review their building code and consider requirements for tsunami-resistant construction standards in vulnerable areas.

- **Enhancement of Current Capabilities**—As tsunami warning technologies evolve, the tsunami warning capability within the planning area will need to be enhanced to provide the highest degree of warning.

- **Vulnerable Populations Planning**—Special attention will need to be focused on the vulnerable communities in the tsunami zone and on hazard mitigation through public education, outreach, and warning capabilities. This issue may be especially important for visitors to San Mateo County.
10.1 General Background

A wildfire is any uncontrolled fire occurring on undeveloped land that requires fire suppression. Wildfires can be ignited by lightning or by human activity such as smoking, campfires, equipment use, and arson.

Fire hazards present a considerable risk to vegetation and wildlife habitats throughout San Mateo County. Short-term loss caused by a wildfire can include destruction of timber, wildlife habitat, scenic vistas, and watersheds. Long-term effects include smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural and economic resources and community infrastructure. Vulnerability to flooding increases through destruction of watersheds. The potential for significant damage to life and property exists in areas designated as wildland-urban interface (WUI) areas, where development is adjacent to densely vegetated areas.

10.1.1 Local Conditions Related to Wildfire

Because natural vegetation and dry-farmed grain areas are extremely flammable during late summer and fall, wildfire is a serious hazard in undeveloped areas and on large lot home sites with extensive areas of un-irrigated vegetation. Grassland fires are easily ignited, particularly in dry seasons. These fires are relatively easily controlled if they can be reached by fire equipment; the burned slopes, however, are highly subject to erosion and gullying.

While brush-lands are naturally adapted to frequent light fires, fire protection in recent decades has resulted in heavy fuel accumulation on the ground. Brush fires, particularly near the end of the dry season, tend to burn fast and very hot, threatening homes and leading to destruction.

DEFINITIONS

**Conflagration**—A fire that grows beyond its original source area to engulf adjoining regions. Wind, extremely dry or hazardous weather conditions, excessive fuel buildup, and explosions are usually the elements behind a wildfire conflagration.

**Firestorm**—A fire that expands to cover a large area, often more than a square mile. A firestorm usually occurs when many individual fires grow together into one. The area involved becomes so hot that all combustible materials ignite, even if they are not exposed to direct flame. Temperatures may exceed 1,000°C. Superheated air and hot gases of combustion rise over the fire zone, drawing surface winds in from all sides, often at velocities approaching 50 miles per hour. Although firestorms seldom spread because of the inward direction of the winds, once started, there is no known way of stopping them. Within the area of the fire, lethal concentrations of carbon monoxide are present; combined with the intense heat, this combination poses a serious life threat to responding fire forces. In very large events, the rising column of heated air and combustion gases carries enough soot and particulate matter into the upper atmosphere to cause cloud nucleation, creating a locally intense thunderstorm and the hazard of lightning strikes.

**Interface Area**—An area susceptible to wildfires and where wildland vegetation and urban or suburban development occur together. An example would be smaller urban areas and dispersed rural housing in forested areas.

**Wildfire**—Fires that result in uncontrolled destruction of forests, brush, field crops, grasslands, and real and personal property in non-urban areas. Because of their distance from firefighting resources, they can be difficult to contain and can cause a great deal of destruction.
serious destruction of vegetative cover. A brush fire that spreads to a woodland can generate a destructive hot crown fire. No suitable management technique of moderate cost has been devised to reduce the risk of brush fires.

Peat fires represent a special hazard in that, once ignited, they are extremely difficult to extinguish. In some instances, islands have been flooded to extinguish peat fires. Any area lying landward of the mean high water line may be peaty because of the marshy origin of the soil.

### 10.1.2 Wildland-Urban Interface (WUI) and Structure Fires

WUI fires occur where combustible vegetation meets combustible structures, combining the hazards associated with wildfires and structure fires. These types of fires have increased dramatically in the last two decades as more and more people move to rural areas. Between 1970 and 1980, the rural population of the United States increased 23.4 percent, more than twice the gain of 11.4 percent for the nation as a whole. The hazard is bi-directional: wildfires can burn homes, and home fires can burn into wildlands, making this type of fire an important consideration in wildfire management.

WUI fires are increasing as more vacation homes are built and improved transportation systems allow more people to live outside city centers. The longer response times for these out-of-the-way locations gives the fire more time to burn out of control, making these fires difficult to fight. Most firefighters are trained to fight either wildfires or structure fires. WUI fires require both skills, and it is difficult to balance the two. When a WUI fire breaks out, the threat of extreme property and casualty losses often forces firefighters to focus their efforts on protecting homes and structures, sometimes at the expense of protecting wildland resources or working to slow the fire itself.

Structure fires are not typically considered an emergency, except when the fire can spread to adjoining structures. Older structures are often more vulnerable to fire (both where the structure fire starts first and where it is a secondary hazard event tied to a wildfire), because the older structures do not conform to modern building and fire codes and do not contain fire detection devices. These structures are also prone to faulty electrical, heating, and other utility systems because of their age and lack of proper maintenance. Many of these older structures were constructed close together, enabling fire to spread rapidly from one to another. These existing vulnerabilities can facilitate the spread of a wildfire to structures, or vice versa, as the structures are already more likely to catch fire. Additionally, it is likely that other defensive measures, such as fire-resistant vegetation and defensible space, are not in place, increasing the probability that structural fires for older buildings will spread to local vegetation and surrounding wildlands.

In contrast, newer residential structures are not as vulnerable to fire as are older structures. These structures include fire-resistant features that conform to modern fire and building codes, as well as fire detection or extinguishing systems. The likelihood that a major structural fire will expand into a wildland fire before it can be brought under control is therefore significantly reduced. Similarly, wildfires will be less able to burn these buildings because of the preventative measures in place.

The storage and use of hazardous materials by commercial and industrial occupancies not only increase the risk of fire but also pose a threat to firefighters and the community if they should become involved in a fire.
Certain materials have been designated by the National Fire Protection Academy (NFPA) as flammable and combustible, such as propane or petroleum; if a wildfire infects a building or container with these materials, it would greatly exacerbate the severity and damage associated with the fire. Toxic chemicals could present public health hazards if a wildfire reaches an industrial sector or building, releasing to toxic fumes as clouds of smoke. In addition to the health concerns and impact to the community, hazardous materials-associated fires (whether initiated by a wildfire or as a structural fire that has spread into the wildland) can also introduce toxins and increase the damage to the local environment, destroying or altering important habitats.

Property owners of structures within the WUI can take preventative measures to reduce the risk of a wildfire creating a secondary structural fire. Fire-resistant plants, implementing 100-feet of defensible space, and additional hardening the property are some of protective measures recommended by the California Department of Forestry and Fire Protection (CAL FIRE) (CAL FIRE 2016).

### 10.1.3 Wildfire Protection Responsibility in California

Hundreds of agencies have fire protection responsibility for wildland and WUI fires in California. Local, state, tribal, and federal organizations have primary legal (and financial) responsibility for wildfire protection. In many instances, two fire organizations have dual primary responsibility on the same parcel of land—one for wildfire protection, and the other for structural or “improvement” fire protection. According to the 2013 California State Hazard Mitigation Plan, this layering of responsibility and resulting dual policies, rules, practices, and legal ordinances can cause conflict or confusion. To address wildfire jurisdictional responsibilities, the California state legislature in 1981 adopted Public Resource Code Section 4291.5 and Health and Safety Code Section 13108.5 establishing the following responsibility areas:

- **Federal Responsibility Areas (FRAs)**—FRAs are fire-prone wildland areas that are owned or managed by a federal agency such as the U.S. Forest Service, National Park Service, Bureau of Land Management, U.S. Fish and Wildlife Service, or U.S. Department of Defense. Primary financial and rule-making jurisdictional authority rests with the federal land agency. In many instances, FRAs are interspersed with private land ownership or leases. Fire protection for developed private property is usually not the responsibility of the federal land management agency; structural protection responsibility is that of a local government agency.

- **State Responsibility Areas (SRAs)**—SRAs are lands in California where CAL FIRE has legal and financial responsibility for wildfire protection and where CAL FIRE administers fire hazard classifications and building standard regulations. SRAs are defined as lands that meet the following criteria:
  - Are county unincorporated areas
  - Are not federally owned
  - Have wildland vegetation cover rather than agricultural or ornamental plants
  - Have watershed or range/forage value
  - Have housing densities not exceeding three units per acre.
  - Where SRAs contain built environment or development, the responsibility for fire protection of those improvements (non-wildland) is that of a local government agency.
Local Responsibility Areas (LRAs) — LRAs include land in cities, cultivated agriculture lands, and non-flammable areas in unincorporated areas, and lands that do not meet the criteria for SRA or FRA. LRA fire protection is typically provided by city fire departments, fire protection districts, and counties, or by CAL FIRE under contract to local governments. Four fire districts are participating in the San Mateo County Hazard Mitigation Plan (HMP) Update; they include Belmont Fire Protection District, Colma Fire Protection District, San Mateo County Fire Department, and Woodside Fire Protection District. LRAs may include flammable vegetation and WUI areas where the financial and jurisdictional responsibility for improvement and wildfire protection is that of a local government agency.

SRAs were originally mapped in 1985, while LRAs were originally mapped in 1996. During that time, many local governments made similar designations under their own authority. CAL FIRE recognized the need to remap both SRAs and LRAs with more recent data and technology to create more accurate zone designations. Updated SRA maps were released in May 2011 and again in August 2012. SRA and LRA maps, released in November 2007 and December 2008, are available at the county level for San Mateo County on CAL FIRE’s Fire and Resource Assessment Program (FRAP) website.

FRAP not only contains maps showing high hazard fire zones in SRA and LRA, it offers a multitude of fire management prevention and planning tools. Other maps and geographic information system (GIS) information include bioregions, fire management environments, fire perimeters, fire threat, fuel rank, surface fuels, land cover, watersheds, historical and anticipated development, and more. FRAP also conducts a periodic assessment on state forests and rangelands to determine the amount and extent of these resources, analyze their conditions, and identify alternative management and policy guidelines. The assessment also enhances inter-agency collaboration between state and federal agencies on forest and rangeland resources. The 2015 assessment is still in production and not available on line; however, the 2010 and 2003 assessment can both be accessed through the FRAP website (http://frap.fire.ca.gov/assessment/).

Additionally, SB 1241 (adopted in fall 2012) requires local governments to update the safety elements in their general plan to recognize wildfire risks in SRAs and Very High Fire Hazard Severity Zones to enhance inter-agency coordination. SB 1241 correlates strongly with AB 2140, which requires local jurisdictions to adopt a federally approved HMP through reference in the safety element of their general plan. This bill also notes the requirement for the safety element to include information and policies on unreasonable risk from potential hazards, including fire. These bills are both designed to encourage integration intra-jurisdictionally and inter-jurisdictionally to enhance mitigation and prevention efforts. Information from a city or town’s safety element should be considered with the development of an HMP, response procedures, evacuation planning, and long-term development.
10.2 Hazard Profile

The 2013 California State Hazard Mitigation Plan provides the following description of wildfire hazard and risk:

“The diversity of WUI settings and disagreement about alternative mitigation strategies has led to confusion and different methods of defining and mapping WUI areas. One major disagreement has been caused by terms such as ‘hazard’ and ‘risk’ being used interchangeably. Hazard is the physical condition that can lead to damage to a particular asset or resource. The term ‘fire hazard’ is related to those physical conditions related to fire and its ability to cause damage, specifically how often a fire burns a given locale and what the fire is like when it burns (its fire behavior). Thus, fire hazard only refers to the potential characteristics of the fire itself.

Risk is the likelihood of a fire occurring at a given site (burn probability) and the associated mechanisms of fire behavior that cause damage to assets and resources (fire behavior). This includes the impact of fire brands (embers) that may be blown some distance igniting fires well away from the main fire” (California 2013).

10.2.1 Past Events

Fire is a normal part of most forest and range ecosystems in temperate regions of the world. Fires historically burn on a fairly regular cycle, recycling carbon and nutrients stored in the ecosystem and strongly affecting the species within the ecosystem. Annual acreage consumed by wildfires in the lower 48 states dropped from about 40 to 50 million acres per year in the 1930s to under 5 million acres by 1970. A western Washington study estimated that modern wildfires consume only about a tenth of the biomass each year that prehistoric fires burned.

While San Mateo County has a prolific fire history, few of its fires have caused sufficient damage to trigger a state or federal disaster declaration. According to the 2013 California State Hazard Mitigation Plan, San Mateo County has been included in two state or federal declared fire emergencies between 1950 and December 2012. Specifics on which fire emergencies were not available through either the state HMP or the Federal Emergency Management Agency’s (FEMA’s) disaster list.

CAL FIRE maintains statistics on historical wildfire activity through its annual reporting (Redbooks). Wildfire statistics include state and county information, cause and size, acres burned, and dollar damage, among other details. The table below shows the wildfire activity for San Mateo County between 2000 and 2013, the most recent annual report available. CAL FIRE has Redbooks available for every year back through 1942. Although fire statistics are available for 2014, 2014, and 2016, a breakdown at the county level is not yet available.
10.2.2 Location

CAL FIRE maps areas of significant fire hazards based on factors such as the following:

- **Fuel**—Fuel may include living and dead vegetation on the ground, along the surface as brush and small trees, and above the ground in tree canopies. Lighter fuels such as grasses, leaves, and needles quickly expel moisture and burn rapidly, while heavier fuels such as tree branches, logs, and trunks take longer to warm and ignite. Trees killed or defoliated by forest insects and diseases are more susceptible to wildfire.

- **Weather**—Relevant weather conditions include temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount and duration, and the stability of the atmosphere. Of particular importance for wildfire activity are wind and thunderstorms:
  - Strong, dry winds produce extreme fire conditions. Such winds generally reach peak velocities during the night and early morning hours.
  - The thunderstorm season typically begins in June with wet storms and turns dry with little or no precipitation reaching the ground as the season progresses into July and August.

- **Terrain**—Topography includes slope and elevation. The topography of a region influences the amount and moisture of fuel; the impact of weather conditions such as temperature and wind;
potential barriers to fire spread, such as highways and lakes; and elevation and slope of land forms (fire spreads more easily uphill than downhill).

A fire hazard severity scale has been devised taking these factors into consideration that characterizes zones by the number of days of moderate, high and extreme fire hazard. These zones, referred to as Fire Hazard Severity Zones (FHSZ), define the application of various mitigation strategies to reduce risk associated with wildfires.

Figure 10-1 shows the Very High Fire Hazard Severity Zone (VHFHSZ) and other severity zones for LRA and SRA for San Mateo County. These maps are the basis for this wildfire risk assessment. City-level VHFHSZ maps are also available on CAL FIRE’s website for Belmont, Half Moon Bay, Hillsborough, Portola Valley, Redwood City, San Carlos, San Mateo, and Woodside.
The FHSZ model is built from existing data and hazard constructs developed by CAL FIRE’s Fire and Resource Assessment Program. The model refines the zones to characterize fire exposure mechanisms that cause ignitions to structures. The model characterizes potential fire behavior for vegetation fuels, which are by nature dynamic. Since model results are used to identify permanent engineering mitigations for structures, it is desirable that the model reflect changes in fire behavior over the length of time a structure is likely to be in place. Significant land-use changes need to be accommodated through period maintenance routines.

The model output of fire probability also is based on frequency of fire weather, ignition patterns, expected rate-of-spread, and fire history. It also accounts for flying ember production and hazards based on the area of influence where embers are likely to land and cause ignitions. Embers are the principal driver of hazard in densely developed areas. A related concern in built-out areas is the relative density of vegetative fuels that can serve as sites for new spot fires within the urban core and spread to adjacent structures.
The geography, weather patterns, and vegetation in the Bay Area provide ideal conditions for recurring wildfires. Especially vulnerable are the SRA between Shelter Cove, Moss Beach, Half Moon Bay, Sky Londa, and Crystal Springs Lake. The southern half of the County is mostly rated as moderate or high, with some very high sections, including in La Honda. LRA rated as very high include land immediately west of Crystal Springs Lake, land near Woodside and Sky Londa, and land about halfway between Half Moon Bay and Moss Beach. Very high LRA are adjacent to very high risk SRA.

### 10.2.3 Frequency

Based on risk factors for the County and past occurrences, it is highly likely that wildfires will continue to occur in San Mateo County. Wildfires are influenced by both weather and human activities. Based on its history of past events, San Mateo County has a high chance of a wildfire in any given year. The most common causes of wildfires, based on past events, will be “undetermined,” equipment use, miscellaneous, and power line/electric power.

### 10.2.4 Severity

Potential losses from wildfire include human life, structures and other improvements, and natural resources. Although no major noteworthy fires were listed in San Mateo County, a 2008 fire in neighboring Santa Clara County provides an example for how quickly a wildfire can turn destructive. In May 2008, a wildfire burned 10 homes, threatened an additional 50 homes, and spread across 3,000 acres in northern California. The wildfire began in Santa Clara County and moved south toward Santa Cruz County. It was fueled by dry brush and caused the evacuation of 190 people. At least 149 firefighters were needed to manage the blaze (CNN 2008).

CAL FIRE tracks the deadliest, largest, and most destructive wildfires that have occurred in the state, with the lists last updated in late January 2016. San Mateo County is not included in any of these lists; however, neighboring Alameda County is on these lists. While San Mateo County does not share contiguous wildlands with Alameda County, this fire demonstrates a worst-case scenario fire that could occur in counties in the Bay Area. The October 1991 Oakland/Berkeley Hills “Tunnel Fire” is listed as the most damaging fire and the second most deadly fire to occur in California. This WUI fire resulted in 25 lives lost, including a fire battalion chief and an Oakland police officer, 148 people injured, and 2,900 structures destroyed. The blaze started from a grass fire in the Berkeley Hills and burned 1,600 acres. The estimated private property loss was $1.7 billion at the time, according to the Insurance Information Institute. The only other relatively local fire to make one of CAL FIRE’s top 20 lists is a September 1923 fire, also in Alameda County. This fire broke out as a result of powerlines in the City of Berkeley, burning 130, damaging 548 structures, but causing no deaths. It is ranked as the 11th most damaging fire in state history.

Given the immediate response times to reported fires, the likelihood of injuries and casualties is minimal. Smoke and air pollution from wildfires can be a health hazard, especially for sensitive populations, including children, the elderly, and those with respiratory and cardiovascular diseases. Wildfire may also threaten the health and safety of those fighting the fires. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke. In addition, wildfire can lead to...
ancillary impacts such as landslides in steep ravine areas and flooding caused by the impacts of silt in local watersheds.

10.2.5 Warning Time

Wildfires are often caused by humans, intentionally or accidentally. There is no way to predict when one might break out. Since fireworks often cause brush fires, extra diligence is warranted around the Fourth of July, when the use of fireworks is highest. Dry seasons and droughts are factors that greatly increase the likelihood of fire, which has led to increased concern on fire management for the last several years in the County and state. Dry lightning may trigger wildfires. Severe weather can be predicted, so special attention can be paid during weather events that may include lightning. Reliable National Weather Service lightning warnings are available on average 24 to 48 hours before a significant electrical storm.

If a fire breaks out and spread rapidly, residents may need to evacuate within days or hours. A fire’s peak burning period generally is between 1 p.m. and 6 p.m. Once a fire has started, fire alerting is reasonably rapid in most cases. The rapid spread of cellular and two-way radio communications in recent years has further contributed to a significant improvement in warning time.

10.2.6 SECONDARY HAZARDS

Wildfires can generate a range of secondary effects, which in some cases may cause more widespread and prolonged damage than the fire itself. Fires can cause direct economic losses in the reduction of harvestable timber and indirect economic losses in reduced tourism. Wildfires contaminate reservoirs, destroy transmission lines, and contribute to flooding. They strip slopes of vegetation, exposing them to greater amounts of runoff, in turning weakening soils and causing failures on slopes. Major landslides can occur several years after a wildfire. Most wildfires burn hot and for long durations that can bake soils, especially those high in clay content, thus increasing the imperviousness of the ground, increasing the runoff generated by storm events, thus enhancing the chance of flooding.

10.2.7 EXPOSURE

Population

Exposed population for the wildfire risk areas (very high, high, and moderate fire severity zones) was estimated using the percentage of residential structures exposed multiplied by the estimated population for each jurisdiction. The results are shown in Table 10-2. Approximately 5 percent of the total County population lives in areas identified as very high severity zones, less than 1 percent of the total population lives in areas identified as high severity zones, and less than 1 percent of the population lives in moderate severity zones. In total, 5.8 percent of the County’s population lives in a wildfire risk area.

In addition to the populations living in wildfire risk areas, people working or recreating in resource lands, such as hikers, are exposed to the wildfire risk. Firefighting crews are exposed as they work to combat fires and to protect property. All county residents are potentially exposed to the health-related impacts of reduced air quality from wildland fires.
### Table 10-2. Population Within Wildland Fire Severity Zones

<table>
<thead>
<tr>
<th></th>
<th>Very High</th>
<th></th>
<th></th>
<th>High</th>
<th></th>
<th></th>
<th>Moderate</th>
<th></th>
<th></th>
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<td></td>
<td>Buildings</td>
<td>Population</td>
<td>% of Total</td>
<td>Buildings</td>
<td>Population</td>
<td>% of Total</td>
<td>Buildings</td>
<td>Population</td>
<td>% of Total</td>
</tr>
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<tr>
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<td><strong>1,511</strong></td>
<td><strong>4,548</strong></td>
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<td><strong>742</strong></td>
<td><strong>1,987</strong></td>
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**Property and Present Land Use**

Table 10-3 and Table 10-4 show the number of structures in the planning area that are located in the fire hazard severity zones and their values. Approximately 4 percent of the total replacement value of the County is located in areas identified as very high severity zones, 1.4 percent of the total replacement value is located in areas identified as high severity zones, and less than 1 percent of the total replacement value is located in moderate severity zones. In total, 6.3 percent of the County's total replacement value is located in a wildfire risk area.

Table 10-5 shows the type of structures in wildfire risk areas in the County. The vast majority of these structures (83 percent) are located in the very high risk zone, 11 percent are located in high severity risk zones, and 6 percent are located in moderate risk zones. Approximately 95 percent of exposed structures are residential. (Table 10-6)
### Table 10-3. Exposure and Value of Structures in Very High Severity Zones

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Buildings Exposed</th>
<th>Value Exposed</th>
<th>% of Total Replacement value</th>
</tr>
</thead>
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<td></td>
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<td>East Palo Alto</td>
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Note: Values shown are accurate only for comparison among results in this plan. See Section 1, Chapter 2 for a discussion of data limitations.

### Table 10-4. Exposure and Value of Structures in High Severity Zones

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<tr>
<th>Jurisdiction</th>
<th>Buildings Exposed</th>
<th>Value Exposed</th>
<th>% of Total Replacement value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Structure</td>
<td>Contents</td>
</tr>
<tr>
<td>Atherton</td>
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Table 10-4. Exposure and Value of Structures in High Severity Zones

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<td>$0</td>
</tr>
<tr>
<td>Millbrae</td>
<td>0</td>
<td>$0</td>
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</tr>
<tr>
<td>Pacifica</td>
<td>0</td>
<td>$0</td>
<td>$0</td>
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<td>Portola Valley</td>
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<td>$0</td>
<td>$0</td>
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<tr>
<td>Redwood City</td>
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<td>South San Francisco</td>
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</tr>
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<td>$2,274,917,161</td>
<td>$2,161,230,368</td>
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<td>1,511</td>
<td>$2,274,917,161</td>
<td>$2,161,230,368</td>
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Note: Values shown are accurate only for comparison among results in this plan. See Section 1, Chapter 2 for a discussion of data limitations.

Table 10-5. Exposure and Value of Structures in Moderate Severity Zones

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</thead>
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<td></td>
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<td>Contents</td>
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</tr>
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<td>0</td>
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<td>$0</td>
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<tr>
<td>Menlo Park</td>
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### Table 10-5. Exposure and Value of Structures in Moderate Severity Zones

<table>
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<tr>
<th>Jurisdiction</th>
<th>Buildings Exposed</th>
<th>Structure</th>
<th>Contents</th>
<th>Total</th>
<th>% of Total Replacement Value</th>
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</thead>
<tbody>
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<tr>
<td>South San Francisco</td>
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<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Woodside</td>
<td>0</td>
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<td>0.0%</td>
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<td>$1,385,559,244</td>
<td>$2,856,120,011</td>
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<tr>
<td><strong>Total</strong></td>
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<td><strong>$1,481,735,932</strong></td>
<td><strong>$1,402,321,992</strong></td>
<td><strong>$2,884,057,924</strong></td>
<td><strong>0.9%</strong></td>
</tr>
</tbody>
</table>

*a The exposed structure for Brisbane is within Brisbane’s sphere of influence, but is outside of city limits and the ultimate responsibility of the County of San Mateo.

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.

### Table 10-6. Present Land Use in Wildfire Hazard Zones

<table>
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<tr>
<th>Jurisdiction</th>
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<th>Commercial</th>
<th>Industrial</th>
<th>Agriculture/Forestry</th>
<th>Religion</th>
<th>Government</th>
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<td>0</td>
<td>0</td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Daly City</td>
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<td>0</td>
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<td>0</td>
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<td><strong>11</strong></td>
<td><strong>31</strong></td>
<td><strong>14,059</strong></td>
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</table>

Note: Values shown are accurate only for comparison among results in this plan. See Section 2, Chapter 1 for a discussion of data limitations.
a. Structure type assigned to best fit HAZUS occupancy classes based on present use classifications provided by San Mateo County assessor’s data. Where conflicting information was present in the available data, parcels were assumed to be improved.
b. Estimates include structure counts for very high, high, and medium severity zones.

**Critical Facilities and Infrastructure**

Tables 10-7 through Table 10-9 identify critical facilities located in wildfire hazard severity zones.

Currently there is 1 hazardous material containment sites identified in wildfire risk zones. During a wildfire event, containers with these materials could rupture because of the excessive heat and act as fuel for the fire, causing rapid spreading and escalating the fire to unmanageable levels. In addition, they could leak into surrounding areas, saturating soils and seeping into surface waters, and have a disastrous effect on the environment.

In the event of wildfire, there would likely be little damage to the majority of infrastructure. Most road and railroads would be without damage except in the worst scenarios. Power poles are the most at risk to wildfire because most are made of wood and susceptible to burning. In the event of a wildfire, pipelines could provide a source of fuel and lead to a catastrophic explosion.

### Table 10-7. Critical Facilities in Very High Severity Wildfire Zones

<table>
<thead>
<tr>
<th></th>
<th>Medical and Health Services</th>
<th>Emergency Services</th>
<th>Government</th>
<th>Utilities</th>
<th>Transportation Infrastructure</th>
<th>Hazardous Materials</th>
<th>Community Economic Facilities</th>
<th>Other Assets</th>
<th>Total</th>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
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<td>0</td>
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<td>0</td>
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</tr>
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</table>

**SECTION 2 - Chapter 10**

Wildfire
## TABLE 10-7. CRITICAL FACILITIES IN VERY HIGH SEVERITY WILDFIRE ZONES

<table>
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<th>Medical and Health Services</th>
<th>Emergency Services</th>
<th>Government</th>
<th>Utilities</th>
<th>Transportation Infrastructure</th>
<th>Hazardous Materials</th>
<th>Community Economic Facilities</th>
<th>Other Assets</th>
<th>Total</th>
</tr>
</thead>
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<td>South San Francisco</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Woodside</td>
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<td>0</td>
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<td>4</td>
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<td>0</td>
<td>0</td>
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## TABLE 10-8. CRITICAL FACILITIES IN HIGH SEVERITY WILDFIRE ZONES

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<th>Government</th>
<th>Utilities</th>
<th>Transportation Infrastructure</th>
<th>Hazardous Materials</th>
<th>Community Economic Facilities</th>
<th>Other Assets</th>
<th>Total</th>
</tr>
</thead>
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Environment

Fire is a natural and critical ecosystem process in most of California’s diverse terrestrial ecosystems, dictating in part the types, structure, and spatial extent of native vegetation in the state. Many of California’s ecosystems are adapted to historical patterns of fire occurrence in a given area. These patterns, called “fire regimes,” include temporal attributes (frequency and seasonality), spatial attributes (size and spatial complexity), and magnitude attributes (intensity and severity), each of which have ranges of natural variability.

Ecosystem stability is threatened when any of the attributes for a given fire regime diverge from its range of natural variability. Compared with historical fire regimes, many mixed-conifer forests now experience fires that are more intense and severe, while chaparral brush-lands experience fire at a greater frequency. Both trends have profound impacts on ecosystem stability throughout California.

Wildfires can cause severe environmental impacts:
Damaged Fisheries—Critical fisheries can suffer from increased water temperatures, sedimentation, and changes in water quality.

Soil Erosion—The protective covering provided by foliage and dead organic matter is removed, leaving the soil fully exposed to wind and water erosion. Accelerated soil erosion occurs, causing landslides and threatening aquatic habitats.

Spread of Invasive Plant Species—Non-native woody plant species frequently invade burned areas. When weeds become established, they can dominate the plant cover over broad landscapes, and become difficult and costly to control.

Disease and Insect Infestations—Unless diseased or insect-infested trees are swiftly removed, infestations and disease can spread to healthy forests and private lands. Timely active management actions are needed to remove diseased or infested trees.

Destroyed Endangered Species Habitat—Catastrophic fires can have devastating consequences for endangered species.

Soil Sterilization—Topsoil exposed to extreme heat can become water repellant, and soil nutrients may be lost. It can take decades or even centuries for ecosystems to recover from a fire. Some fires burn so hot that they can sterilize the soil.

10.2.8 Vulnerability

Structures, aboveground infrastructure, critical facilities, and natural environments are all vulnerable to the wildfire hazard. No validated damage function is currently available to support wildfire mitigation planning. Except as discussed in this section, vulnerable populations, property, infrastructure and environment are assumed to be the same as described in the section on exposure.

Population

There are no recorded incidents of loss of life from wildfires within the planning area (San Mateo County 2010). Given the immediate response times to reported fires, the likelihood of injuries and casualties is minimal; therefore, injuries and casualties were not estimated for the wildfire hazard.

Smoke and air pollution from wildfires can be a severe health hazard, especially for sensitive populations, including children, the elderly, and those with respiratory and cardiovascular diseases. Smoke generated by wildfire consists of visible and invisible emissions that contain particulate matter (soot, tar, water vapor, and minerals), gases (carbon monoxide, carbon dioxide, and nitrogen oxides), and toxics (formaldehyde and benzene). Emissions from wildfires depend on the type of fuel, the moisture content of the fuel, the efficiency (or temperature) of combustion, and the weather. Public health impacts associated with wildfire include difficulty in breathing, odor, and reduction in visibility.

Wildfire may also threaten the health and safety of those fighting the fires. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke.
**Property**

Loss estimations for the wildfire hazard are not based on damage functions because no such damage functions have been generated. Instead, loss estimates were developed representing 10 percent, 30 percent and 50 percent of the total replacement value of exposed structures. This approach allows emergency managers to select a range of economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered substantial by most building codes and typically requires total reconstruction of the structure. Table 10-10 lists the loss estimates for the general building stock for assets in jurisdictions that have an exposure to a fire hazard severity zone.

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<tr>
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<th>Exposed Value&lt;sup&gt;a&lt;/sup&gt;</th>
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<td>$6,057,267,706.7</td>
<td>$10,095,446,177.7</td>
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<sup>a</sup> Includes total exposed value from all severity zones: very high, high, moderate.

Note: Values shown are accurate only for comparison among results in this plan. See Section Error! Reference source not found. for a discussion of data limitations.

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**Critical Facilities and Infrastructure**

Critical facilities of wood frame construction are especially vulnerable during wildfire events. In the event of wildfire, there would likely be little damage to most infrastructure. Most roads and railroads would be without damage except in the worst scenarios. Power lines are the most at risk from wildfire because most poles are
made of wood and susceptible to burning. Fires can create conditions that block or prevent access and can isolate residents and emergency service providers. Wildfire typically does not have a major direct impact on bridges, but it can create conditions that obstruct bridges. Many bridges in areas of high to moderate fire risk are important because they provide the only ingress and egress to large areas and in some cases to isolated neighborhoods.

**Environment**

The environment vulnerable to wildfires is the same as the environment exposed to the hazard. A wildfire event can alter the landscape, although it primarily damages or destroys vegetation and wildlife habitats. Wildfires also have beneficial natural functions, including removal of invasive plants, renewal of nutrients in soil, pest control, and the potential to create new habitats. When managed successfully, wildfires promote biological diversity and healthy ecosystems (Pacific Biodiversity Institute 2016).

Parks and recreational areas in San Mateo County have greater vulnerability to wildfires than do more developed regions. San Bruno Mountain Park, a landmark of local and regional significance, is one of the more noteworthy of this type of area. It stands as an open-space island amid the peninsula’s urban northern end of the Santa Cruz Mountain Range. Its ridgeline has numerous slopes exceeding 50 percent and elevations from 250 feet to over 1,300 feet. Fourteen species of rare or endangered plants, along with numerous endangered and threatened butterflies, make their home on San Bruno Mountain. The San Bruno Mountain State and County Park Master Plan, last updated in 2001, recommends development of a fire management plan to cover fire management policies and procedures, public education, reduction of the existing heavy fuel load, and how to best utilize fire for the enhancement of endangered species’ habitats (San Mateo County 2001).

**Economic Impact**

Wildfires are typically assumed to only have negative economic impacts; however, this assumption is not quite accurate, based on a research project conducted by the University of Oregon’s Ecosystem Workforce Program. Fires have significant negative economic impacts, including the disruption of the daily lives of employees and employers and instability in local labor markets. Even so, fires can also have some positive impacts, as countywide employment and wages increase in some sectors during wildfires, reducing the negative effect of short-term employment disruption.

Fire management also involves increased spending in wages, supplies, and living resources for firefighters. In 2012, the U.S. Forest Service contributed an average of 6 percent of its funding per county to counties where large wildfires occurred. Although such spending does not completely offset the economic losses from severe wildfires, it does help mitigate the extent of the losses. Even with this benefit in mind, fire suppression funds and wildfires themselves still contribute to longer-term economic instability in local markets, amplification of seasonal “ups and downs,” and reduction in tourism and natural resource economic sector earnings (University of Oregon 2012).

**10.2.9 Future Trends in Development**

Highly urbanized portions of the planning area have little or no exposure to wildfire risk. Urbanization tends to alter the natural fire regime and can create the potential for the expansion of urbanized areas into wildland
areas. The expansion of the WUI can be managed with strong land use and building codes. The planning area is well equipped with these tools, and this planning process has asked each planning partner to assess its capabilities with regards to the tools. As San Mateo County experiences future growth, it is anticipated that the exposure to this hazard will remain as assessed or even decrease over time due to these capabilities.

Additionally, SB 1241, mentioned earlier in this profile, requires the legislative body of a county or city “to adopt a comprehensive, long-term general plan that includes various elements, including, among others, a safety element for the protection of the community from unreasonable risks associated with, among other things, wildland and urban fires. The safety element includes requirements for state responsibility areas, as defined, and very high fire hazard severity zones, as defined” (California Legislative Information 2012). This requirement ensures that every planning partner will continue to incorporate fire management planning and preventative measures into their community development and growth management practices.
## TABLE 10-11. MODERATE WILDFIRE RISK – FUTURE LAND USE EXPOSURE

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<th>Agriculture/Resource Extraction</th>
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<th>Industrial</th>
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10.2.10 Scenario

A major conflagration in San Mateo County might begin with a wet spring, adding to fuels already present on the forest floor. Flashy fuels would build throughout the spring. The summer could see the onset of insect infestation. A dry summer could follow the wet spring, exacerbated by dry hot winds. Carelessness with combustible materials or a tossed lit cigarette, or a sudden lighting storm, could trigger a multitude of small, isolated fires.

The embers from these smaller fires could be carried miles by hot, dry winds. The deposition zone for these embers would be deep in the forests and interface zones. Fires that start in flat areas move slower, but wind still pushes them. It is not unusual for a wildfire pushed by wind to burn the ground fuel and later climb into the crown and reverse its track. This scenario is one of many ways that fires can escape containment, typically during periods when response capabilities are overwhelmed. These new small fires would most likely merge. Suppression resources would be redirected from protecting the natural resources to saving more remote subdivisions.

The worst-case scenario would be an event similar to the October 1991 Tunnel Fire in Alameda County, where the wildfire spreads to structures, leading to numerous deaths and injuries, hundreds of acres burned, and millions of dollars in property damage. Additionally, fire severity would be exacerbated if the event occurred during an active fire season, where resources are already spread thin. Firefighting teams would be exhausted or unavailable. Many federal assets would be responding to other fires that started earlier in the season. While local fire districts would be extremely useful in the urban interface areas, they have limited wildfire capabilities or experience, and they would have a difficult time responding to the ignition zones. Even though the existence and spread of the fire is known, it may not be possible to respond to it adequately, so an initially manageable fire can become out of control before resources are dispatched.

To further complicate the problem, heavy rains could follow, causing flooding and landslides and releasing tons of sediment into rivers, permanently changing floodplains and damaging sensitive habitat and riparian areas. Such a fire followed by rain could release millions of cubic yards of sediment into streams for years, creating new floodplains and changing existing ones. With the forests removed from the watershed, stream flows could easily double. Floods that could be expected every 50 years may occur every couple of years. With the streambeds unable to carry the increased discharge because of increased sediment, the floodplains and floodplain elevations would increase.

10.2.11 Issues

The major issues for wildfire are the following:

- Public education and outreach to people living in or near the fire hazard zones should include information about and assistance with mitigation actions such as defensible space and advance identification of evacuation routes and safe zones.
- Wildfires could cause landslides as a secondary natural hazard.
- Climate change could affect the wildfire hazard.
Future growth into interface areas should continue to be managed.

Area fire districts need to continue to train on wildland-urban interface events.

Vegetation management activities—This issue would include enhancement through expansion of the target areas as well as additional resources.

Regional consistency of higher building code standards such as residential sprinkler requirements and prohibitive combustible roof standards.

Firefighters in remote and rural areas are faced with limited water supply and lack of hydrant taps. Rural areas are adapting to these conditions by developing a secondary water source. Areas that once were considered rural could become urban with incorporation and annexation, coupled with development.

Expand certifications and qualifications for fire department personnel.

Ensure that all firefighters are trained in basic wildfire behavior, basic fire weather, and that all company officers and chief level officers are trained in the wildland command and strike team leader level.
Chapter 11.
Human-Caused Hazards

11.1 General Background

Although the DMA does not require an assessment of human-caused hazards, the Steering Committee officials decided to include human-caused hazards in this hazard mitigation plan for the following reasons:

- San Mateo County takes a proactive approach to disaster preparedness, especially in an effort to protect the safety of all citizens.
- Preparation for and response to a human-caused disaster will involve many of the same staff training, critical decisions, and commitment of resources as a natural hazard.
- The multi-hazard mitigation planning effort is an opportunity to inform the public about all hazards, including human-caused hazards.
- The likelihood of a human-caused hazard in San Mateo County is greater than several of the identified natural hazards in this plan.

Human-caused hazards fall into the following categories:

- Manmade hazards include acts of terrorism, including the use of weapons of mass destruction and cyber threats. These hazards are intentional, criminal, malicious acts.
- Technological hazards are incidents that arise from human activities such as the manufacture, transportation, storage and use of hazardous materials; pipeline and tank releases; and airline incidents. These incidents are assumed to be accidental in nature, with unintended consequences.

DEFINITIONS

Distribution Pipeline—Pipeline systems designed to transport refined materials to the end user.
Malware—Malicious code designed to steal, ransom, conceal, or destroy information from vulnerable or infected computer or network systems.
Terrorism—The unlawful use or threatened use of force or violence against people or property, with the intention of intimidating or coercing societies or governments. Terrorism is either foreign or domestic, depending on the origin, base, and objectives of the terrorist or organization.
Technological Hazards—Hazards from accidents associated with human activities such as the manufacture, transportation, storage and use of hazardous materials.
Transmission Pipeline—Large diameter pipes designed to transport raw material from the point of excavation to refineries for processing.
Weapons of Mass Destruction—Chemical, biological, radiological, nuclear, and explosive weapons associated with terrorism.
Hazardous Material—A substance or combination of substances that because of their concentration, physical, chemical, or infectious characteristics, may cause or contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness, or pose a present or potential hazard to human life, property, or the environment.
11.1.1 Manmade Hazards

Terrorism

The Federal Bureau of Investigation (FBI) categorizes terrorism in the United States primarily as one of two types:

- Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction. The bombing of the Alfred P. Murrah federal building in Oklahoma City is an example of domestic terrorism. The FBI is the primary response agency for domestic terrorism. The FBI is the primary investigative agency for terrorism affecting the United States, while response to domestic terrorism remains a local responsibility. The FBI and the Department of Homeland Security (DHS) work together to coordinate domestic preparedness programs and activities of the United States to limit acts posed by terrorists including the use of weapons of mass destruction (WMDs).

- International terrorism involves groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States, or whose activities transcend national boundaries. Examples include the 1993 bombing of the World Trade Center, the 1983 U.S. Capitol and the attacks of September 11, 2001 at the World Trade Center and the Pentagon.

The three key elements to defining a terrorist event are as follows:

- Activities involve the use of illegal force.
- Actions are intended to intimidate or coerce.
- Actions are committed in support of political or social objectives.

At least three important considerations distinguish terrorism hazards from other types of hazards:

- In the case of chemical, biological, and radioactive agents, their presence may not be immediately obvious, making it difficult to determine when and where they may have been released, who has been exposed, and what danger is present for first responders and emergency medical technicians.
- There is limited scientific understanding of how these agents affect the population at large.
- Terrorism evokes very strong emotional reactions including anxiety, fear, anger, despair, and depression.

Those involved with terrorism response, including public health and public information staff, are trained to deal with the public’s emotional reaction swiftly as response to the event occurs. The area of the event must be clearly identified in all emergency alert messages, to prevent those not affected by the incident from overwhelming local emergency rooms and response resources therefore reducing service to those actually affected. The public will be informed clearly and frequently about what government agencies are doing to mitigate the impacts of the event. The public will also be given clear directions on how to protect the health of individuals and families.
According to Federal Emergency Management Agency (FEMA) 386-7, terrorism refers to the use of weapons of mass destruction, including biological, chemical, nuclear and radiological weapons; arson, incendiary, explosive and armed attacks; industrial sabotage and intentional hazardous materials releases; agro-terrorism; and cyberterrorism (detailed in the Cyber Threats section below). The following are potential methods used by terrorists that could affect the County of San Mateo as a direct target or collaterally:

- Conventional explosive
- Biological agent
- Chemical agent
- Nuclear bomb
- Radiological agent
- Arson/incendiary attack
- Armed attack
- Cyberterrorism (described in the Cyber Threats section)
- Agro-terrorism
- Intentional hazardous material release.

Table 11-1 provides a hazard profile summary for terrorism-related hazards. For each type of hazard, the following factors are addressed:

- Application Mode—Application mode describes the human acts or unintended events necessary to cause the hazard to occur.
- Duration—Duration is the length of time the hazard is present. For example, the duration of a tornado may be just minutes, but a chemical warfare agent such as mustard gas, if un-remediated, can persist for hours or weeks under the right conditions.
- Dynamic or Static Characteristics—Dynamic or static characteristics of a hazard describe its tendency, or that of its effects, to either expand, contract, or remain confined in time, magnitude, and space. For example, the physical destruction caused by an earthquake is generally confined to the place in which it occurs, and it does not usually get worse unless aftershocks or other cascading failures occur; in contrast, a cloud of chlorine gas leaking from a storage tank can change location by drifting with the wind and can diminish in danger by dissipating over time.
- Mitigating and Exacerbating Conditions—Mitigating conditions are characteristics of the target and its physical environment that can reduce the effects of a hazard. For example, earthen berms can provide protection from bombs; exposure to sunlight can render some biological agents ineffective; and effective perimeter lighting and surveillance can minimize the likelihood of someone approaching a target unseen. In contrast, exacerbating conditions are characteristics that can enhance or magnify the effects of a hazard. For example, depressions or low areas in terrain can trap heavy vapors, and a proliferation of street furniture (trash receptacles, newspaper vending machines, mail boxes, etc.) can provide hiding places for explosive devices.

Most terrorist events in the United States have been bombing attacks, involving detonated and undetonated explosive devices, tear gas, pipe bombs, and fire bombs. The effects of terrorism can vary from loss of life and injuries to property damage and disruptions in services such as electricity, water supplies, transportation, or communications. Any of the methods above may have an immediate effect or a delayed effect. Terrorists often choose targets that offer limited danger to themselves and areas with relatively easy public access. Foreign
terrorists look for visible targets where they can avoid detection before and after an attack such as international airports, large cities, major special events, and high-profile landmarks.

In dealing with intentional human-caused hazards, the unpredictability of human beings must be considered. People with a desire to perform criminal acts may seek out targets of opportunity that may not fall into established lists of critical areas or facilities. First responders train not only to respond to organized terrorism events, but also to random acts by individuals who, for a variety of reasons ranging from fear to emotional trauma to mental instability, may choose to harm others and destroy property.

While education, heightened awareness, and early warning of unusual circumstances may deter crime and terrorism, intentional acts that harm people and property are possible at any time. Public safety entities would then react to the threat, locating, isolating, and neutralizing further damage, and investigating potential scenes and suspects to bring criminals to justice.

### TABLE 11-1. EVENT PROFILES FOR TERRORISM

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Application Mode</th>
<th>Hazard Duration</th>
<th>Static/Dynamic Characteristics</th>
<th>Mitigating and Exacerbating Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Bomb</td>
<td>Detonation of explosive device on or near target; delivery via person, vehicle, or projectile.</td>
<td>Instantaneous; additional “secondary devices, and/or diversionary activities may be used, lengthening the duration of the hazard until the attack site is determined to be clear.</td>
<td>Extent of damage is determined by type and quantity of explosive. Effects generally static other than cascading consequences, incremental structural failure, etc.</td>
<td>Overpressure at a given standoff is inversely proportional to the cube of the distance from the blast; thus, each additional increment of standoff provides progressively more protection. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting energy and debris. Exacerbating conditions include ease of access to target; lack of barriers and shielding; poor construction; and ease of concealment of device.</td>
</tr>
<tr>
<td>Chemical Agent</td>
<td>Liquid and aerosol contaminants can be dispersed using sprayers or other aerosol generators; liquids vaporizing from puddles and containers; or munitions.</td>
<td>Chemical agents may pose viable threats for hours to weeks depending on the agent and the conditions in which it exists.</td>
<td>Contamination can be carried out of the initial target area by persons, vehicles, water, and wind. Chemicals may be corrosive or otherwise damaging over time if not remediated.</td>
<td>Air temperature can affect evaporation of aerosols. Ground temperature affects evaporation of liquids. Humidity can enlarge aerosol particles, reducing inhalation hazard. Precipitation can dilute and disperse agents but can spread contamination. Wind can disperse vapors but also cause target area to be dynamic. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects.</td>
</tr>
<tr>
<td>Hazard</td>
<td>Application Mode</td>
<td>Hazard Duration</td>
<td>Static/Dynamic Characteristics</td>
<td>Mitigating and Exacerbating Conditions</td>
</tr>
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<td>--------------------------------</td>
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<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Arson or Incendiary Attack</td>
<td>Initiation of fire or explosion on or near target via direct contact, or remotely</td>
<td>Generally minutes to hours.</td>
<td>Extent of damage is determined by type and quantity of device, accelerant, and materials present at or near target. Effects generally static other than cascading consequences, incremental structural failure, etc.</td>
<td>Mitigating factors include built-in fire detection and protection systems, and fire-resistant construction techniques. Inadequate security can allow easy access to target, easy concealment of an incendiary device, and undetected initiation of a fire. Non-compliance with fire and building codes, as well as failure to maintain existing fire protection systems can substantially increase the effectiveness of a fire weapon.</td>
</tr>
<tr>
<td>Armored Attack</td>
<td>Tactical assault or sniping from remote location, or random attack based on fear, emotion, or mental instability.</td>
<td>Generally minutes to days.</td>
<td>Varies based on the perpetrators’ intent and capabilities.</td>
<td>Inadequate security can allow easy access to target, easy concealment of weapons, and undetected initiation of an attack.</td>
</tr>
<tr>
<td>Biological Agent</td>
<td>Liquid or solid contaminants can be dispersed using sprayers or aerosol generators, or by point or line sources such as munitions, covert deposits, and moving sprayers.</td>
<td>Biological agents may pose viable threats for hours to years depending on the agent and the conditions in which it exists.</td>
<td>Depending on the agent used and the effectiveness with which it is deployed, contamination can be spread via wind and water. Infection can spread via human or animal vectors.</td>
<td>Altitude of release aboveground can affect dispersion; sunlight is destructive to many bacteria and viruses; light to moderate wind will disperse agents but higher winds can break up aerosol clouds; the micro-meteorological effects of buildings and terrain can influence aerosolization and travel of agents.</td>
</tr>
<tr>
<td>Agro-terrorism</td>
<td>Direct, generally covert contamination of food supplies or introduction of pests and/or disease agents to crops and livestock.</td>
<td>Days to months.</td>
<td>Varies by type of incident. Food contamination events may be limited to specific distribution sites, whereas pests and diseases may spread widely. Generally no effects on built environment.</td>
<td>Inadequate security can facilitate adulteration of food and introduction of pests and disease agents to crops and livestock.</td>
</tr>
</tbody>
</table>
### Table 11-1. Event Profiles for Terrorism

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Application Mode</th>
<th>Hazard Duration</th>
<th>Static/Dynamic Characteristics</th>
<th>Mitigating and Exacerbating Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiological Agent</td>
<td>Radioactive contaminants can be dispersed using sprayers or aerosol generators, or by point or line sources such as munitions.</td>
<td>Contaminants may remain hazardous for seconds to years depending on material used.</td>
<td>Initial effects will be localized to site of attack; depending on meteorological conditions, subsequent behavior of radioactive contaminants may be dynamic.</td>
<td>Duration of exposure, distance from source of radiation, and the amount of shielding between source and target determine exposure to radiation.</td>
</tr>
<tr>
<td>Nuclear Bomb</td>
<td>Detonation of nuclear device underground, at the surface, in the air, or at high altitude.</td>
<td>Light/heat flash and blast/shock wave last for seconds; nuclear radiation and fallout hazards can persist for years. Electromagnetic pulse from a high-altitude detonation lasts for seconds and affects only unprotected electronic systems.</td>
<td>Initial light, heat, and blast effects of a subsurface, ground, or air burst are static and determined by the device’s characteristics and employment; fallout of radioactive contaminants may be dynamic, depending on meteorological conditions.</td>
<td>Harmful effects of radiation can be reduced by minimizing the time of exposure. Light, heat, and blast energy decrease logarithmically as a function of distance from seat of blast. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting radiation and radioactive contaminants.</td>
</tr>
<tr>
<td>Intentional Hazardous Material Release (fixed facility or transportation)</td>
<td>Solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers</td>
<td>Hours to days.</td>
<td>Chemicals may be corrosive or otherwise damaging over time. Explosion and/or fire may be subsequent. Contamination may be carried out of the incident area by persons, vehicles, water, and wind.</td>
<td>As with chemical weapons, weather conditions directly affect how the hazard develops. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects. Non-compliance with fire and building codes, as well as failure to maintain existing fire protection and containment features, can substantially increase the damage from a hazardous materials release.</td>
</tr>
</tbody>
</table>

Source: FEMA 386-7

**Cyber Threats**

As information technology continues to flourish and grow in capability and interconnectivity, cyber threats become increasingly frequent and destructive. In 2014, internet security teams at Symantec and Verizon indicated that nearly 1 million new pieces of malware – malicious code designed to steal or destroy information...
were created every day (Harrison 2015). The San Mateo Steering Committee identified two separate types of cyber threats that may occur within the Planning Area: cyberattacks and cyberterrorism.

Cybercrime

Computer systems on the county, local, and individual level are likely to experience a variety of cybercrime, from malware to targeted attacks on system capabilities. These cybercrime attacks specifically seek to breach information technology (IT) security measures designed to protect an individual or organization. The initial attack is subsequently followed by further, more severe attacks for the purpose of causing harm or stealing data. Organizations are prone to a multitude of different types of attacks.

Table 11-2 describes the most frequent cyberattack mechanisms faced by organizations today.

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socially Engineered Trojans</td>
<td>Programs designed to mimic legitimate processes (e.g. updating software, running fake antivirus software) with the end goal of human-interaction caused infection. When the victim runs the fake process, the Trojan is installed on the system.</td>
</tr>
<tr>
<td>Unpatched Software</td>
<td>Nearly all software has weak points that may be exploited by malware. Most common software exploitations occur with Java, Adobe Reader, and Adobe Flash. These vulnerabilities are often exploited as small amounts of malicious code are often downloaded via drive-by download.</td>
</tr>
<tr>
<td>Phishing</td>
<td>Malicious email messages that ask users to click a link or download a program. Phishing attacks may appear as legitimate emails from trusted third parties.</td>
</tr>
<tr>
<td>Password Attacks</td>
<td>Third party attempts to crack a user’s password and subsequently gain access to a system. Password attacks do not typically require malware, but rather stem from software applications on the attacker’s system. These applications may use a variety of methods to gain access, including generating large numbers of generated guesses, or dictionary attacks, in which passwords are systematically tested against all of the words in a dictionary.</td>
</tr>
<tr>
<td>Drive-by Downloads</td>
<td>Malware is downloaded unknowingly by the victims when they visit an infected site.</td>
</tr>
<tr>
<td>Denial of Service Attacks</td>
<td>Attacks that focus on disrupting service to a network in which attackers send high volumes of data until the network becomes overloaded and can no longer function.</td>
</tr>
<tr>
<td>Man in the Middle (MITM)</td>
<td>MITM attacks mirror victims and endpoints for online information exchange. In this type of attack, the MITM communicates with the victim who believes interacting with the legitimate endpoint website. The MITM is also communicating with the actual endpoint website by impersonating the victim. As the process goes through, the MITM obtains entered and received information from both the victim and endpoint.</td>
</tr>
<tr>
<td>Malvertising</td>
<td>Malware downloaded to a system when the victim clicks on an affected ad.</td>
</tr>
<tr>
<td>Advanced Persistent Threat (APT)</td>
<td>An attack in which the attacker gains access to a network and remains undetected. APT attacks are designed to steal data instead of cause damage.</td>
</tr>
</tbody>
</table>
Since 2013, a new type of cyberattack is becoming increasingly common against individuals and small- and medium-sized organizations. This attack is called cyber ransom. Cyber ransom occurs when an individual downloads ransom malware, or ransomware, often through phishing or drive-by download, and the subsequent execution of code results in encryption of all data and personal files locally stored on the system. The victim then receives a message that demands a fee in the form of electronic currency, such as BitCoin, for the decryption code (Figure 11-1). With millions of threats created each day, the importance of protection against cyberattacks becomes a necessary function of everyday operations for individuals, government, and businesses located in San Mateo County. The increasing dependency on technology for vital information storage and the often automated method of infection means higher stakes for protection and education.

**Cyberterrorist**

Cyberterrorism is the use of existing computers and information, particularly over the internet, to recruit others to an organization’s cause, cause physical or financial harm, or cause a severe disruption of infrastructure service. The motive behind such disruptions can be driven by religious, political, or other objectives. Similar to traditional terrorism tactics, cyberterrorism’s purpose is to evoke very strong emotional reactions such as anxiety, fear, anger, despair, depression, or even sympathy as a recruitment tool for an organization. However, the mechanism for achieving these goals are through IT and not necessarily a tangible violent or physically disruptive action.

The purpose of cyberterrorism can be broken out into three main objectives: organizational, undermining, and destructiveness. Each objective indicates a use of IT for a specific purpose (Kostadinov 2012).

As an **organizational** objective, cyberterrorism includes specific functions outside of or in addition to a typical cyberattack. Terrorist groups today use the internet on a daily basis. This daily use may include recruitment, training, fundraising, communication, or planning. Organizational cyberterrorism can use platforms such as social media, as a tool to spread a message beyond country borders and instigate physical forms of terrorism. Additionally, organizational goals may use systematic attacks as a tool for training new members of a faction in cyber warfare.

**Undermining** as an objective seeks to achieve the hindrance of normal functioning computer systems, services, or websites. Such methods include defacing, denying, and exposing information. While undermining tactics are typically used due to high dependence on online structures to support vital operational functions, they typically do not result in grave consequences unless undertaken as part of a larger attack.

Three kinds of undermining attacks that can be conducted on computers include attacks of physical means, electronic means, and attacks using malicious code (Waldron 2011). Specifically, these types of attacks include:
- Directing conventional kinetic weapons against computer equipment, a computer facility, or transmission lines to create a physical attack that disrupts the reliability of equipment.
- The power of electromagnetic energy, most commonly in the form of an electromagnetic pulse (EMP), can be used to create an electronic attack (EA) directed against computer equipment or data transmissions. By overheating circuitry or jamming communications, an EA disrupts the reliability of equipment and the integrity of data.
- Malicious code can be used to create a cyberattack, or computer network attack (CNA), directed against computer processing code, instruction logic, or data. The code can generate a stream of malicious network packets that can disrupt data or logic through exploiting vulnerability in computer software, or a weakness in the computer security practices of an organization. This type of cyberattack can disrupt the reliability of equipment, the integrity of data, and the confidentiality of communications (Wilson 2008).

The destructive objective for cyberterrorism is what organizations fear most. Through the use of computer technology and the internet, terrorists seek to inflict destruction or damage on tangible property or assets, and even death or injury to individuals. There are no cases of pure cyberterrorism as of the date of this plan.

### 11.1.2 Technological Hazards

Technological hazards are associated with human activities such as the manufacture, transportation, storage and use of hazardous materials. Incidents related to these hazards are assumed to be accidental with unintended consequences. Technological hazards in San Mateo County can be categorized as follows:

- Hazardous materials incidents
- Pipeline and tank incidents
- Aircraft accidents.

**Hazardous Materials Incidents**

Hazardous materials are substances that are considered severely harmful to human health and the environment, as defined by the United States Environmental Protection Agency (USEPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (commonly known as Superfund).

Many hazardous materials are commonly used substances which are harmless in their normal uses, but are quite dangerous if released. The United States Environmental Protection Agency (USEPA) designates more than 800 substances as hazardous and identifies many more as potentially hazardous due to their characteristics and the circumstances of their release (USEPA 2013).

If released or misused, hazardous substances can cause death, serious injury, long-lasting health effects, and damage to structures, other properties, and the environment. Many products containing hazardous substances are used and stored in homes and these products are shipped daily on highways, railroads, waterways, and pipelines.

The following are the most common types of hazardous material incidents:
Fixed-Facility Hazardous Materials Incident—This is the uncontrolled release of materials from a fixed site capable of posing a risk to health, safety, and property as determined by the Resource and Conservation and Recovery Act. It is possible to identify and prepare for a fixed-facility incident because federal and state laws require those facilities to notify state and local authorities about what is being used or produced at the site.

Hazardous Materials Transportation Incident—A hazardous materials transportation incident is any event resulting in uncontrolled release of materials during transport that can pose a risk to health, safety, and property as defined by Department of Transportation Materials Transport regulations. Transportation incidents are difficult to prepare for because there is little if any notice about what materials could be involved should an accident happen. Hazardous materials transportation incidents can occur at any place within the country, although most occur on the interstate highways or major federal or state highways, or on the major rail lines.

Pipeline and Tank Hazards
Transmission and distribution pipelines provide two differing services. Transmission pipelines transport raw material for further refinement. These pipes are large and far reaching, operating under high pressure. Distribution pipelines provide the processed materials to the end user. These are smaller in diameter, some as small as a half an inch, and operate under lower pressure.

Although pipelines are the safest and most reliable way to transport natural gas, crude oil, liquid petroleum products, and chemical products, there is still an inherent risk due to the nature of the hazardous materials. Pipelines are regulated by the Office of the State Fire Marshall Pipeline Safety Division. Pipelines are also monitored by a complex data web called System Control and Data Acquisition (SCADA), measuring the flow rate, temperature and pressure. The network transfers real-time data via satellite from the pipelines to a control center where the valves, pumps, and motors are remotely operated. If tampering with the pipeline occurs, an alarm sounds. The ensuing valve reaction is instantaneous, with the alarm system isolating any rupture and setting off a chain reaction that shuts down pipeline pumps and alerts pipeline operators within seconds.

Pipeline failure incidents, both distribution and transmission, can occur when pipes corrode, are damaged during excavation, incorrectly operated, or damaged by other forces. More serious accidents occur on distribution pipelines than on any other type due to their sheer number, intricate networking system, and location in highly populated areas.

Tank hazards, both above and below ground, have potential to cause immense damage due to the large quantities of concentrated hazardous materials in a single location. Potential results of an event involving a tank release include fire, explosion, and exposure to toxic substances.

Aviation Accidents
Aviation accidents can occur for numerous reasons including mechanical failure, poor weather conditions, and pilot error. They are defined as an occurrence associated with the operation of an aircraft which takes place between the time a person boards the aircraft with the intention of flight, to the time the person has
disembarked the aircraft. There are three different occurrences that determine an aviation accident: a person is fatally or seriously injured; the aircraft sustains damage or structural failure; or the aircraft is missing or completely inaccessible. An aviation incident is an occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation (International Civil Aviation Organization, 2001).

Aviation accidents are often devastating incidents that may result in serious injuries or fatalities. The Federal Aviation Administration (FAA) and the National Transportation Safety Board (NTSB) are the agencies responsible for monitoring air travel and investigating accidents. Some of the most common causes of aviation accidents occur as a result of violating FAA and NTSB regulations. Some other causes of accidents include, but are not limited to:

- **Pilot or flight crew errors** – Pilot errors are the number one cause of aviation accidents and account for the highest number of fatalities. Pilots have the responsibility to transport passengers safely from one place to another and follow FAA and NTSB regulations to better ensure passenger safety. If a pilot or flight crew makes an error, an accident may occur.
- **Faulty equipment** – Faulty aircraft equipment and/or mechanical features are another common cause of an aviation accident.
- **Aircraft design flaws** – The manufacturer of an aircraft is responsible for an aviation accident if the structural design is flawed and results in an accident.
- **Failure to properly fuel or maintain the aircraft** – If regulations and safety standards set by the FAA or NTSB are violated, an accident may occur.
- **Negligence of Federal Air Traffic Controllers (ATC)** – The failure of air traffic controllers to properly monitor the airways is another cause of aviation accidents.

### 11.2 Human-Caused Hazard Profile

#### 11.2.1 Past Events

**State of California**

**Manmade: Terrorism and Cyber Threat Events**

According to the Governor’s Office of Emergency Services Terrorism Response Plan, the State of California has had a long history of defending the public against domestic and foreign terrorists. Domestic terrorist groups in California have been focused on political or social issues, while the limited internationally based incidents have targeted the state’s immigrant communities due to foreign disputes. Advanced technologies and communication have allowed these groups to become more sophisticated and better organized, with remote members linked electronically.

**Technological: Hazardous Materials Release, Pipeline and Tank, and Aircraft Accidents**

No comprehensive source was found for technological hazard incidents affecting the entire State of California. Technological events are typically regional or local in nature due to the limited reach of such events.
Regional

Manmade:

Terrorism Events
The Bay Area has not experienced a regional terrorism event. However, the 2016 hosting of Super Bowl 50 in Santa Clara County highlighted and increased the mainstream exposure of the Bay Area for potential future terrorist events.

Cyber Threats
In December 2015, University of California at Berkeley experienced a massive cyberattack that left upwards of 80,000 people exposed to cybercrime. As one of the largest employers in the Bay Area, this cyberattack reached beyond jurisdictional and county lines to affect the entire Bay Area (Bay City News, 2015).

Technological Hazard Incidents

Hazardous Materials Release
The Bay Area has not experienced a hazardous materials release event with a regional affect. Hazardous material releases are often localized due to the limited release of such events.

Pipeline or Tank Hazard
The Bay Area has not experienced a regional pipeline or tank hazard event. Pipeline or tank hazards are often localized due to the limited release of such events.

Aircraft Accidents
The Bay Area has not experienced an aircraft accident that caused widespread devastation throughout the region, such as the Aeromexico DC-9 airplane the collided with a private plane and crashed in a residential neighborhood in Cerritos, California. Aircraft accidents have been localized and somewhat contained.

Local

Manmade:

Terrorism Events
On August 24, 2009, a student at Hillsdale High School in the City of San Mateo intended to detonate multiple homemade bombs and murder fellow students. Security was alerted before the student was able to execute his plan.

From 1975–1977, the New World Liberation Front planned and executed multiple minor attacks in Belmont, Burlingame, Redwood City, the City of San Mateo, San Bruno, and Hillsborough. Successful attacks resulted in minor property damage with one reported injury in San Mateo.

In May 1972, left-wing militants injured one person during a bombing of MB Associates in Menlo Park.
Cyber Threats
On December 3, 2014, multiple Bay Area governments were shut down as a result of a global cyberattack. Burlingame and Belmont experienced website outages due to a denial of service attack on a San Francisco-based company that provided services for the affected jurisdictions.

Technological:
Hazardous Materials Release
Although hazardous material incidents can happen almost anywhere, certain areas are at higher risk. Jurisdictions near roadways that are frequently used for transporting hazardous materials and jurisdictions with industrial facilities that use, store, or dispose of such materials all have an increasing potential for major incidents, as do jurisdictions crossed by certain railways, waterways, airways and pipelines. Hazardous materials are transported through the County via highways and pipelines. Public facilities and numerous businesses located in the County store and use reportable quantities of hazardous materials. San Mateo County’s level of exposure to hazardous materials can be understood by examining the County’s types of businesses, commercial traffic routes, highway, and sea exposure.

CERCLA, Emergency Planning and Community Right-to-Know Act (EPCRA) and California law require responsible parties to report hazardous material releases if certain criteria is met. CERCLA requires that all releases of hazardous substances (including radionuclides) exceeding reportable quantities be reported by the responsible party to the National Response Center. If an accidental chemical release exceeds the EPCRA applicable minimal reportable quantity, the facility must notify State Emergency Response Commissions (SERCs) and Local Emergency Planning Committees (LEPCs) for any area likely to be affected by the release, and provide a detailed written follow-up as soon as practicable. Information about accidental chemical releases must be made available to the public. California Governor’s Office of Emergency Services (Cal OES) Spill Release Archive Files contain spreadsheet files that list all spills reported to the Cal OES Warning Center for a specific year. In 2015, there were 108 reportable hazardous materials releases within San Mateo County. This year, through April 11, 2016, there have been 51 reportable hazardous materials releases so far, meeting the criteria that exceeds reportable quantities.

Pipeline
Pipelines owned and operated by various companies run beneath the County and City streets. Pipelines are primarily underground, which keeps them away from public contact and accidental damage, except where distribution pipelines meet their termination point for providing their source for public consumption. Despite safety and efficiency statistics, increases in energy consumption and population growth near pipelines present the potential for a pipeline emergency incident. While pipelines are generally the safest method of transporting hazardous chemicals, they are not fail-safe. Pipeline product releases, whether in the form of a slow leak or violent rupture, are a risk in any community.

The 2010 San Bruno pipeline explosion occurred on September 9, 2010, in San Bruno, California, killing eight people and causing more than $54 million in damage to homes and vehicles, with additional costs to rebuild San Bruno’s streets, sewers, sidewalks and other infrastructure. A 30-inch diameter steel natural gas pipeline owned by Pacific Gas & Electric (PG&E) exploded into flames in the Crestmoor residential neighborhood,
two miles west of San Francisco International Airport. In 2011, PG&E was subject to an exhaustive review of the pipelines’ safety and approval for restoration of full pressure from the California Public Utilities Commission (CPUC). PG&E reduced the pipelines’ pressure by about 20 percent as a precaution shortly after the natural gas accident in San Bruno. Since then, the utility has verified the safety of these pipelines through a robust program that includes pressure tests, records verification and visual pipeline inspections.

Aircraft
The San Francisco International Airport (SFO) is located in an unincorporated area of the County. According to the Airports Council International, SFO is the 5th busiest airport in the nation in terms of passenger volume and 13th busiest in cargo volume. Air traffic statistics for January of 2016 include 34,076 flights consisting of passenger carriers, air taxis, civil, and military planes. Statistics for 2015 include 34,172 carrier flights. In 2014, SFO was the 9th busiest airport in the United States based on the number of flight operations. On July 6, 2013, an Asiana Airlines Boeing 777 with more than 300 passengers and crew members on board crashed while landing at San Francisco International Airport. According to U.S. court filings, three people were killed and more than 180 were injured. Since the airport opened in 1927, there have been 14 airplane crashes at SFO.

11.2.2 Location

Manmade:

Terrorism
The State of California and Office of Homeland Security have identified numerous high-profile targets for potential terrorists in California. Large population centers, high-visibility tourist attractions, and critical infrastructure accessible to the public present security challenges of an ongoing nature in California. The network of highways, railways, ports, and airports used to transport significant amounts of hazardous materials poses a significant technological hazards threat. Multiple incidents may happen simultaneously, and all typically require a multi-agency, multi-jurisdictional response.

Cyber Threats
Possible cyberterrorist targets include the banking industry, power plants, air traffic control centers, and water systems; and especially facilities that rely on computers, computer systems, and programs for their operations.

Both public and private operations within San Mateo County are threatened on a near-daily basis by the millions of currently engineered cyberattacks developed to automatically seek technological vulnerabilities.

Technological:

Hazardous Materials Release
 Fixed Site
Hazardous materials are stored before and after they are transported to their intended use. This may include service stations that store gasoline and diesel fuel in underground storage tanks (USTs); hospitals that store radioactive materials, flammable materials and other hazardous substances; or manufacturers, processors, distributors, and recycling plants for chemical industries which store a variety of chemicals on site (FEMA 2013).
For the purpose of this plan, fixed sites include buildings or property where hazardous materials are manufactured or stored, and are regulated under various programs by the USEPA.

The USEPA Toxic Substances Control Act of 1976 provides the USEPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from TSCA, including among others, food, drugs, cosmetics, and pesticides. TSCA addresses the production, importation, use, and disposal of specific chemicals including polychlorinated biphenyls (PCBs), asbestos, radon, and lead-based paint. According to TSCA, one USEPA regulated facility is located in Redwood City.

In addition to TSCA facilities, facilities identified under the Resource Conservation and Recovery Act Information (RCRA Info) databases were also reviewed for this plan. Hazardous waste information is contained in RCRA Info, a national program management and inventory system about hazardous waste handlers. In general, entities that generate, transport, treat, store, and dispose of hazardous waste are required to provide information about their activities to state environmental agencies. These agencies pass on the information to regional and national USEPA offices. This regulation is governed by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984. There are over 1,500 RCRA facilities within San Mateo County.

Transportation

Incidents involving hazardous materials in transit can occur through a variety of vehicles in and around San Mateo County. The Planning Area hosts a variety of major transportation networks through which trains, aircraft, water vessels, and commercial trucks transporting hazardous materials travel daily.

Pipeline and Tank

Pipeline

Jet fuel is delivered via pipelines to SFO underground, and in populated areas. These pipelines must be over three feet below the asphalt, with pipes made of at least one-inch thick steel. If a pipe ruptures, valves would cut off and operators would receive an automatic alarm. Additionally, PG&E runs multiple natural gas transmission pipelines throughout the County, such as the one that exploded in 2010.

The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) provides an interactive mapping tool for public awareness of major transmission pipelines that run through a user-defined geographical area. Figure 11-2 presents the pipeline query results for San Mateo County.
Distribution pipelines run throughout highly populated areas for the purpose of providing refined materials for public use and consumption. Large distribution lines, called “mains,” move the gas close to cities. These main lines, along with the much smaller service lines that travel to homes and businesses, account for the vast majority of underground pipeline system.

Tank
Jet fuel to be used for planes at SFO is stored at SFO Fuel, an airline consortium which leases the SFO Fuel Tank Farm Facility at the SFO. The tank farm facility is operated by Chevron and includes seven above-ground storage tanks with a total capacity of nearly 15 million gallons. The largest tanks can hold up to approximately 90,000 barrels of jet fuel. **There are risks in storing petroleum in aboveground storage tanks, which can leak and pose a threat to the land, environment, and navigable waterways.** A container (i.e. storage tank) cannot be used for storage unless its material and construction are compatible with the material stored and conditions of storage such as pressure and temperature. There are many aboveground tanks within San Mateo County.

The County of San Mateo has a stringent program for aboveground fuel storage tanks. The Health and Safety Code defines an “aboveground storage tank” or “storage tank” as a tank that has the capacity to store 55 gallons or more of petroleum and is substantially or totally above the surface of the ground. Additionally, a “Tank Facility” means one or more aboveground storage tanks, including any piping that is integral to the tanks, that contain petroleum, and are used by a single business entity at a single location or site. A Tank Facility that stores 1,320 gallons or more of petroleum in aboveground storage containers or tanks is required to comply...
with the Aboveground Petroleum Storage Act (APSA), prepare and implement a Spill Prevention Control and Countermeasure (SPCC) plan, and submit an annual Aboveground Petroleum Storage Tank Facility Statement.

Aircraft Accidents
San Mateo County is home to the San Francisco International Airport (SFO). SFO infrastructure is owned and operated by the City and County of San Francisco, while the land on which SFO is located belongs to the San Mateo County. SFO is the only airport located within San Mateo County that has international air traffic. SFO was invited to take part in this plan and declined. Because SFO infrastructure is owned and operated by the City and County of San Francisco, SFO is covered in the San Francisco hazard mitigation plan and is not a planning partner in the San Mateo planning process. San Mateo County operates two local airports – one in Half Moon Bay, and one in San Carlos. Outside of those airports located within County lines, Oakland International and Mineta San Jose International are located in close proximity to the County. As such, incoming air traffic to these two additional high volume airports has the potential to cause accidents within San Mateo County. Figure 11-3 shows the location of these identified airports.

![Figure 11-3. Airports Around San Mateo County](image)

Source: Google Maps
11.2.3 Frequency

**Manmade:**

**Terrorism**

As of 2015, California’s economy was the largest of any state in the U.S. San Mateo County’s proximity to San Francisco and Silicon Valley presents unique conditions for terrorist attacks. The transportation, energy, and communications systems that cross the County have impacts on the local, regional, and even national economy. In general, the risks of a terrorist event involving a WMD are as follows:

- **Chemical**—The risk of a chemical event is present in San Mateo County. The agricultural community in San Mateo County uses and stores significant amounts of chemicals for peaceful and productive means that could be used in destructive ways.

- **Explosives**—Pipe bomb and suspicious package events have occurred in San Mateo County in the past. While none of the events has been specifically identified as a WMD-related attack, the elements necessary to construct a WMD are readily available. Additionally, the agricultural communities maintain sufficient products and quantities for use in explosive events.

- **Radiological/Nuclear**—The major transportation arteries for vehicles or rail that cross through San Mateo County contribute to the risk of a radiological event. Such products can unknowingly pass through any one of the regional transportation corridors.

- **Biological**—Anthrax incidents that occurred in the U.S. in October 2001 demonstrate the potential for spreading terror through biological WMDs. The introduction of Newcastle disease in the United States demonstrates how an agent can be introduced to livestock, causing harm to public health and the economy.

- **Combined Hazards**—WMD agents can be combined to have a greater total effect. When combined, the impacts of the event can be immediate and longer-term. Casualties will likely suffer from both immediate and long-term burns and contamination. Given the risks associated with chemical agents in San Mateo County, the possibility exists for such a combined event to occur.

**Cyber Threats**

Cyberattacks are experienced on a daily basis, often times without being noticed. Up-to-date virus protection software used in both public and private sectors prevent most cyberattacks from becoming successful. Programs that promote public education to that end are also an effective way in which to mitigate cyber threats.

Cyberterrorism is much less common than cyberattacks, and the frequency is unknown.

**Technological:**

Hazardous material incidents may occur at any time in San Mateo County, given the presence of transportation routes bisecting the County, the location of businesses and industry that use hazardous materials, the presence of scattered illegitimate businesses such as clandestine drug laboratories at any given time, and the improper disposal of hazardous waste.
11.2.4 Severity

The severity of human-caused hazards is challenging to measure. Severity could range from a minor transportation accident to a full-scale terrorist attack.

The term mass-casualty incident (MCI) is often applied to transportation accidents involving air travel, as well as multi-vehicle highway accidents. However, MCIs may also result from hazardous materials incidents or acts of violence, such as shootings or hostage situations. Effects may include serious injuries, loss of life, and associated property damage.

Because large numbers of patients may be involved, significant MCIs may tax local emergency medical and hospital resources, and therefore require a regional response. MCIs may occur throughout the County, day or night, at any time of the year on any roadway.

The location of SFO and local airports face the risk of an MCI. Adverse weather may also play a role in roadway or air accidents. Pipeline and tank explosions can expose populations to fire or toxic materials. MCIs may also result from acts of violence or terrorism, which could include a chemical, biological or radiological incident, contaminating persons and requiring mass decontamination.

11.2.5 Warning Time

Very few terrorism incidents are preceded by a warning, and in the case of a technological hazard, accidents occur without predictability under circumstances that give responders little time to prepare. Nonetheless, the San Mateo County Sheriff’s Office (SMSO) contributes staffing to the San Francisco Division Office of the Joint Terrorism Task Force. In addition, SMSO operates one of four regional Fusion Centers in California; they are intended to be information-sharing enterprises to bridge gaps between local, state, and federal efforts on an all-hazards, all-crimes level, and is known as the Northern California Regional Intelligence Center (NCRIC). The NCRIC is a government program that helps safeguard the community by serving as a dynamic security nexus to detect, prevent, investigate, and respond to criminal and terrorist activity. The NCRIC disseminates intelligence and facilitates communications between federal, state, and local agencies, and private sector critical infrastructure partners to help them take action on threats and public safety issues. Continued concentrated and deliberate efforts through the NCRIC may increase warning times.

11.3 Secondary Hazards

Human-caused hazards are not like natural hazards that have measurable secondary impacts. The largest secondary impact caused by human-caused hazards would be economic. Economic impacts from human-caused hazards could be significant:

- The cost of a terrorist act would be felt in terms of loss of life and property, disruption of business activity and long-term emotional impacts. Recovery would take significant resources and expense at the local level.
- The economic impact of computer security breaches associated with data and telecommunications losses can be staggering.
Pipeline and tank failure impacts can include both the cost of community recovery for the area surrounding the failure site and the cost of a disruption of services for the material transported by the pipeline.

A large aircraft accident could have compounding effects on the economy, from recovery needs if an aircraft accident occurred in a residential neighborhood, to revenue lost from cancelled incoming flights.

Hazardous materials releases have the potential to cause major disruptions to local businesses that house hazardous materials. Additionally, a hazardous materials release could cause businesses to close if they are located in the path of the hazardous materials flow.

11.4 Exposure

The human-caused hazard risk assessment is based on a system that measures a facility’s criticality and physical vulnerability. Criticality is a measure of the potential consequence of an accident or terrorist event as well as the attractiveness of the facility to a potential adversary or threat. The criticality for each critical facility is based on the factors shown in Table 11-3. The criticality for each critical facility is based on the following:

- **Awareness**—How aware is the public of the existence of the facility, site, system, or location?
- **Hazardous Materials**—Are flammable, explosive, biological, chemical and/or radiological materials present on site?
- **Collateral Damage Potential**—What are the potential consequences for the surrounding area if the asset is attacked or damaged?
- **Site Population**—What is the potential for mass causalities, based on the capacity of the facility?
- **Public or Emergency Functions**—Does the facility perform a function during an emergency? Is this facility or function capable of being replicated elsewhere?

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>Not known/Neighborhood</td>
<td>City/Region/County</td>
<td>State/National</td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>None/Limited &amp; secure</td>
<td>Moderate/Large &amp; secure</td>
<td>Large/Minimal or no security</td>
</tr>
<tr>
<td>Collateral Damage Potential</td>
<td>None or low</td>
<td>Moderate/Immediate area or within 1 mile radius</td>
<td>High/Immediate area or within 1 mile radius</td>
</tr>
<tr>
<td>Site Population</td>
<td>0–300</td>
<td>301–1,000</td>
<td>1,001 or greater</td>
</tr>
<tr>
<td>Public/Emergency Function</td>
<td>No emergency function, or could be used in the future for emergency function</td>
<td>Support Emergency Function—Redundant site</td>
<td>Emergency Function—Critical service with or without redundancy</td>
</tr>
</tbody>
</table>

Vulnerability is a measure of the physical opportunity for an accident or an adversarial attack. This assessment takes into consideration physical design, existing countermeasures, and site layout. The vulnerability for each critical facility is based on the criteria shown in Table 11-4. The vulnerability for each critical asset is based on the following:
Table 11-4. Vulnerability Criteria

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
<th>Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>How accessible is the facility or site to the public?</td>
<td>Remote location, secure perimeter, tightly controlled access</td>
</tr>
<tr>
<td>Automobile Proximity</td>
<td>How close can an automobile get to the facility? How vulnerable is the facility to a car bomb attack?</td>
<td>Not within 75–100 feet</td>
</tr>
<tr>
<td>Asset Mobility</td>
<td>Is the facility location fixed or mobile? If mobile, how often is it moved, relocated, or repositioned?</td>
<td>Moves or is relocated frequently</td>
</tr>
<tr>
<td>Proximity to other Critical Facilities</td>
<td>If the facility is close to other critical facilities, there is an increased chance of the facility receiving collateral damage.</td>
<td>Greater than 1.5–2 miles</td>
</tr>
<tr>
<td>Secure Design</td>
<td>General evaluation of areas of obstruction, air intake locations, parking lot and road design and locations, and other site design aspects.</td>
<td>No areas for concealment of packages, air intakes are on roof, accessways are not under the structure.</td>
</tr>
</tbody>
</table>

11.4.1 Population

A human-caused hazard event could range from an isolated accident to a highly coordinated act of destruction by multiple agents upon multiple targets. Large-scale incidents have the potential to kill or injure many citizens in the immediate vicinity, and may also affect people at a relative distance from the initial event. This report does not consider a set distance to determine those more or less at risk. Variables affecting exposure for a WMD attack and a hazardous material accident include the type of product, the physical and chemical
properties of the substance, the physical state of the product (solid, liquid, or gas), the ambient temperature, wind speed, wind direction, barometric pressure, and humidity.

With so many variables to determine “toxic endpoints” as defined by the California Environmental Protection Agency, distances are difficult to forecast. In general, those close to the major transportation corridors or businesses with acutely hazardous materials are more at risk for some sort of effect; but again, each chemical incident will be different and the scenarios are too numerous to describe in this plan.

Hazardous materials pose a significant risk to emergency response personnel. All potential first responders and follow-on emergency personnel in the Planning Area currently are and will be properly trained to the level of emergency response actions required of their individual position at the response scene. Hazardous materials also pose a serious long-term threat to public health and safety, property, and the environment.

11.4.2 Property

San Mateo County is among the fastest growing counties in California, making it a higher profile target for terrorism. Additionally, San Mateo’s location between Silicon Valley and San Francisco make San Mateo County vulnerable to secondary and cascading effects of a possible terrorist threat.

11.4.3 Critical Facilities and Infrastructure

Critical facilities are limited to identified planning partner facilities, and other government facilities such as the U.S. Post Office, private utility infrastructure and administrative offices, and medical facilities. Secure areas vary from jurisdiction to jurisdiction. Based on the criticality factors and vulnerability criteria described above, these facilities are all at risk because of their accessibility, automobile accessibility, and lack of a secure or hardened design.

11.4.4 Environment

The risk of human-caused hazards to the environment is considerable. Hazardous materials spilled along roads or railways as a result of an intentional or unintentional act could easily pollute rivers, streams, wetlands, riparian areas, and adjoining fields. Other hazardous materials released into the air could severely impact plant and animal species. By reducing the risk exposure to the built environment, the county will also mitigate potential losses to the natural environment.

11.5 Vulnerability

11.5.1 Population

Although human-caused hazards have not resulted in a large number of deaths in this area, this type of hazard can be deadly and widespread. Injuries and casualties were not estimated for this hazard. Any individuals exposed to human-caused hazards are considered to be at risk, particularly those working as first responder professionals.
11.5.2 Property

All structures in San Mateo County are physically vulnerable to a human-caused hazard. The emphasis on accessibility, the opportunity for roof access, driveways underneath some structures, unmonitored areas, the proximity of many structures to road and airline transportation corridors and underground pipelines, and the potential for a terrorist to strike any structure randomly, all have an impact on the vulnerability of structures.

11.5.3 Critical Facilities and Infrastructure

Most critical facilities and infrastructure in San Mateo County would be vulnerable to human-caused hazards, including utilities, data and telecommunications systems, and transportation facilities.

11.5.4 Environment

The environment vulnerable to a human-caused hazard is the same as the environment exposed to the hazard. While human-caused disasters have caused significant damage to the environment, estimating damage can be difficult. Loss estimation platforms such as Hazards U.S. – Multi-Hazard (HAZUS-MH) are not equipped to measure environmental impacts of these types of hazards. The best gauge of vulnerability of the environment would be a review of damage from past human-caused hazard events. Loss data for damage to the environment were not available at the time of this plan update. Capturing this data from future events could be beneficial in measuring the vulnerability of the environment for future updates.

11.5.5 Economic impacts

Economic impacts from human-caused hazards could be significant. The cost of a terrorist act would be felt in terms of loss of life and property, disruption of business activity, and long-term emotional impacts. Recovery would take significant resources and expense at the local level.

The economic impact of data and telecommunications losses can be staggering as computer security breaches, crime conducted via the internet such as identify theft, and many more forms of human-caused economic losses occur daily. Millions of dollars are lost each year as criminals and cyber-terrorists steal sensitive information and funds from individuals and organizations.

11.6 Future Trends in Development

The threat of human-caused hazards and the availability of Homeland Security Funds will influence future development of the County’s critical facilities. However, the potential for human-caused hazards in San Mateo County is not likely to lessen or prohibit future development.

11.7 Scenario

Two human-caused hazard scenarios could have a significant impact on San Mateo County. The first scenario would involve hazardous materials being transported via pipeline or highway systems that bisect the Planning Area. The release of hazardous materials via intentional or unintentional means could impact large population centers within the County, particularly on the populated Bayside. Knowledge of the location of pipelines and
vehicles would play a role in preparedness for this scenario, thus reducing its potential impact. The biggest issue in response to hazardous material is material identification and containment.

The second scenario that could have a significant impact on the Planning Area would be a terrorist event at a large gathering place such as a mall or event center. Terrorist events happen with little or no warning. With a population of nearly 800,000 people and location on the San Francisco Peninsula, San Mateo County has potential targets for terrorist activities. The County has taken steps to assess these sites as well as probable scenarios.

11.8 Issues

Important issues associated with human-caused hazards in San Mateo County that support future mitigation actions include but are not limited to the following:

- Participate in regional, state and federal efforts to gather terrorism information at all levels and keep public safety officials briefed at all times regarding any local threats. Staff will then further develop response capabilities based on emerging threats.
- Continue all facets of emergency preparedness training for Police, Fire, Public Works, and Manager/Public Information staff in order to respond quickly in the event of a human-caused disaster. Enhance awareness training for all public employees to recognize threats or suspicious activity to prevent an incident from occurring.
- Work proactively with hazardous materials facilities regarding: placards and labeling of containers; emergency plans and coordination; standardized response procedures; notification of the types of materials being transported through San Mateo County on at least an annual basis; conducting random inspections of transporters as allowed by each company; installation of mitigating techniques along critical locations; routine hazard communication initiatives; and continuously looking to the use of safer alternative products to conduct transport operations.
- Participate in the Cal OES Disaster Resistant California annual conference and other training sessions sponsored by regional, state, and federal agencies.
- Utilize Crime Prevention Through Environmental Design (CPTED) in future planning efforts and enhance existing infrastructure and buildings to prevent or mitigate human-caused incidents. CPTED is an urban planning design process that integrates crime prevention with neighborhood design and community development. CPTED is based on the theory that the proper design and effective use of the built environment can reduce crime and the fear of crime and improve the quality of life. CPTED creates an environment where the physical characteristics, building layout, and site planning allow inhabitants to become key agents in ensuring their own security.
- Participate in regional training exercises per the requirements of Homeland Security Presidential Directive #8 in support of national preparedness. These training exercises, sponsored by the Bay Area Urban Area Security Initiative (UASI), will test and evaluate the ability to coordinate the activities of city, county, and state government first responders, volunteer organizations, and the private sector in responding to terrorism and technological hazards. The trainings will enhance
interagency coordination, provide training to staff, test response and recovery capabilities, and activate the National Incident Management System, Standardized Emergency Management System (SEMS), and the mutual aid system.

- Work with the private sector to enhance and create Business Continuity Plans in the event of an emergency.
- Review existing automatic/mutual aid agreements with other public safety agencies to identify opportunities for enhancement.
- Maintain a regional emergency services information line that the public can contact 24 hours a day during an emergency incident.
- Coordinate with Planning Area school districts to ensure that their emergency preparedness plans include preparation for human-caused incidents.
- Encourage local businesses to adopt IT and telecommunications recovery plans.
A risk ranking was performed for the hazards of concern described in this plan. This risk ranking assesses the probability that each hazard will occur as well as its likely impact on the people, property, and economy of the planning area. The risk ranking methodology and results were reviewed, discussed, and approved by the Steering Committee. When available, estimates of risk were generated with data from HAZUS-MH or geographic information system (GIS) analysis using methodologies promoted by the Federal Emergency Management Agency (FEMA). Qualitative assessments were used for hazards of concern with less robust datasets. As appropriate, results were adjusted based on local knowledge and other information that was not captured in the quantitative assessments. The results are used in establishing mitigation priorities.

12.1 Probability of Occurrence

The probability of occurrence of a hazard is indicated by a probability factor based on the likelihood of annual occurrence:

- **High**—Hazard event is likely to occur within 25 years (Probability Factor = 3)
- **Medium**—Hazard event is likely to occur within 100 years (Probability Factor = 2)
- **Low**—Hazard event is not likely to occur within 100 years (Probability Factor = 1)
- **No exposure**—There is no probability of occurrence (Probability Factor = 0).

The assessment of hazard frequency is generally based on past hazard events in the area. Table 12-1 summarizes the probability assessment for each hazard of concern for this plan.

<table>
<thead>
<tr>
<th>Hazard Event</th>
<th>Probability (high, medium, low)</th>
<th>Probability Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dam failure</td>
<td>Low</td>
<td>1</td>
</tr>
<tr>
<td>Drought</td>
<td>High</td>
<td>3</td>
</tr>
<tr>
<td>Earthquake</td>
<td>High</td>
<td>3</td>
</tr>
<tr>
<td>Flood&lt;sup&gt;b&lt;/sup&gt;</td>
<td>High</td>
<td>3</td>
</tr>
<tr>
<td>Landslide</td>
<td>High</td>
<td>3</td>
</tr>
<tr>
<td>Severe weather</td>
<td>High</td>
<td>3</td>
</tr>
<tr>
<td>Tsunami</td>
<td>High</td>
<td>3</td>
</tr>
<tr>
<td>Wildfire</td>
<td>High</td>
<td>3</td>
</tr>
</tbody>
</table>

<sup>a</sup> 100-year probabilistic results are used for risk ranking
<sup>b</sup> 1 percent annual chance flood event is used for risk ranking
12.2 Impact

Hazard impacts will be assessed in three categories: impacts on people, impacts on property, and impacts on the local economy. Numerical impact factors are assigned as follows:

- **People**—Values are assigned based on the percentage of the total population exposed to the hazard event. The degree of impact on individuals will vary and is not measurable, so the calculation assumes for simplicity and consistency that all people exposed to a hazard because they live in a hazard zone will be equally affected when a hazard event occurs. It should be noted that planners could use an element of subjectivity in assigning values for impacts on people. Impact factors were assigned as follows:
  - High—30 percent or more of the population is exposed to a hazard (Impact Factor = 3)
  - Medium—15 percent to 29 percent of the population is exposed to a hazard (Impact Factor = 2)
  - Low—14 percent or less of the population is exposed to the hazard (Impact Factor = 1)
  - No impact—None of the population is exposed to a hazard (Impact Factor = 0).

- **Property**—Values are assigned based on the percentage of the total property value exposed to the hazard event:
  - High—25 percent or more of the total assessed property value is exposed to a hazard (Impact Factor = 3)
  - Medium—10 percent to 24 percent of the total assessed property value is exposed to a hazard (Impact Factor = 2)
  - Low—9 percent or less of the total assessed property value is exposed to the hazard (Impact Factor = 1)
  - No impact—None of the total assessed property value is exposed to a hazard (Impact Factor = 0).

- **Economy**—Values are assigned based on the percentage of the total property value vulnerable to the hazard event. Values represent estimates of the loss from a major event of each hazard in comparison to the total assessed value of the property exposed to the hazard. Vulnerability was considered the same as or a percentage of exposure because of the lack of loss estimation tools specific to some hazards, such as wildfire, landslide and severe weather. Loss estimates separate from the exposure estimates were generated for the earthquake and flood hazards using HAZUS-MH.
  - High—Estimated loss from the hazard is 15 percent or more of the total exposed property value (Impact Factor = 3)
  - Medium—Estimated loss from the hazard is 5 percent to 14 percent of the total exposed property value (Impact Factor = 2)
  - Low—Estimated loss from the hazard is 4 percent or less of the total exposed property value (Impact Factor = 1)
  - No impact—No loss is estimated from the hazard (Impact Factor = 0).
The impacts of each category are assigned a weighting factor to reflect its significance: impact on people is given a weighting factor of 3; impact on property is given a weighting factor of 2; and impact on the economy is given a weighting factor of 1.

Table 12-2, Table 12-3 and Table 12-4 summarize the impacts for each hazard.

### Table 12-2. Impact on People from Hazards

<table>
<thead>
<tr>
<th>Hazard Event</th>
<th>Impact (high, medium, low)</th>
<th>Impact Factor</th>
<th>Multiplied by Weighting Factor (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dam failure</td>
<td>Medium</td>
<td>2</td>
<td>2 x 3 = 6</td>
</tr>
<tr>
<td>Drought</td>
<td>None</td>
<td>0</td>
<td>0 x 3 = 0</td>
</tr>
<tr>
<td>Earthquake</td>
<td>High</td>
<td>3</td>
<td>3 x 3 = 9</td>
</tr>
<tr>
<td>Flood</td>
<td>Low</td>
<td>1</td>
<td>1 x 3 = 3</td>
</tr>
<tr>
<td>Landslide</td>
<td>Low</td>
<td>1</td>
<td>1 x 3 = 3</td>
</tr>
<tr>
<td>Severe weather</td>
<td>Medium</td>
<td>2</td>
<td>2 x 3 = 6</td>
</tr>
<tr>
<td>Tsunami</td>
<td>Low</td>
<td>1</td>
<td>1 x 3 = 3</td>
</tr>
<tr>
<td>Wildfire</td>
<td>Low</td>
<td>1</td>
<td>1 x 3 = 3</td>
</tr>
</tbody>
</table>

a. Inundation areas for the following dams are included in the combined inundation area: Bear Gulch, Emerald Lake, Felt Lake, Laurel Creek, Lower Crystal Springs, Pilarcitos, Ricky Dam, San Andreas, Searsville.

b. All people in the planning area would be exposed to drought, but drought does not generally cause death or injury.

c. 1 percent annual chance flood event is used for risk ranking.

### Table 12-3. Impact on Property from Hazards

<table>
<thead>
<tr>
<th>Hazard Event</th>
<th>Impact (high, medium, low)</th>
<th>Impact Factor</th>
<th>Multiplied by Weighting Factor (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dam failure</td>
<td>Medium</td>
<td>2</td>
<td>2 x 2 = 4</td>
</tr>
<tr>
<td>Drought</td>
<td>None</td>
<td>0</td>
<td>0 x 2 = 0</td>
</tr>
<tr>
<td>Earthquake</td>
<td>High</td>
<td>3</td>
<td>3 x 2 = 6</td>
</tr>
<tr>
<td>Flood</td>
<td>Low</td>
<td>1</td>
<td>1 x 2 = 2</td>
</tr>
<tr>
<td>Landslide</td>
<td>Low</td>
<td>1</td>
<td>1 x 2 = 2</td>
</tr>
<tr>
<td>Severe weather</td>
<td>Medium</td>
<td>2</td>
<td>2 x 2 = 4</td>
</tr>
<tr>
<td>Tsunami</td>
<td>Low</td>
<td>1</td>
<td>1 x 2 = 2</td>
</tr>
<tr>
<td>Wildfire</td>
<td>Low</td>
<td>1</td>
<td>1 x 2 = 2</td>
</tr>
</tbody>
</table>

a. Inundation areas for the following dams are included in the combined inundation area: Bear Gulch, Emerald Lake, Felt Lake, Laurel Creek, Lower Crystal Springs, Pilarcitos, Ricky Dam, San Andreas, Searsville.

b. All property in the planning area would be exposed to drought, but impacts to structures are expected to be minimal.

c. 1 percent annual chance flood event is used for risk ranking.
### TABLE 12-4. IMPACT ON ECONOMY FROM HAZARDS

<table>
<thead>
<tr>
<th>Hazard Event</th>
<th>Impact (high, medium, low)</th>
<th>Impact Factor</th>
<th>Multiplied by Weighting Factor (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dam failure^a</td>
<td>Medium</td>
<td>2</td>
<td>2 x 1 = 2</td>
</tr>
<tr>
<td>Drought</td>
<td>Low</td>
<td>1</td>
<td>1 x 1 = 1</td>
</tr>
<tr>
<td>Earthquake^b</td>
<td>Low</td>
<td>1</td>
<td>1 x 1 = 1</td>
</tr>
<tr>
<td>Flood^c</td>
<td>Low</td>
<td>1</td>
<td>1 x 1 = 1</td>
</tr>
<tr>
<td>Landslide</td>
<td>Low</td>
<td>1</td>
<td>1 x 1 = 1</td>
</tr>
<tr>
<td>Severe weather</td>
<td>Low</td>
<td>1</td>
<td>1 x 1 = 1</td>
</tr>
<tr>
<td>Tsunami</td>
<td>Low</td>
<td>1</td>
<td>1 x 1 = 1</td>
</tr>
<tr>
<td>Wildfire</td>
<td>Medium</td>
<td>2</td>
<td>2 x 1 = 2</td>
</tr>
</tbody>
</table>

^a. Inundation areas for the following dams are included in the combined inundation area: Bear Gulch, Emerald Lake, Felt Lake, Laurel Creek, Lower Crystal Springs, Pilarcitos, Ricky Dam, San Andreas, Searsville

^b. 100-year probabilistic results are used for risk ranking

^c. 1 percent annual chance flood event is used for risk ranking

### 12.3 Risk Rating and Ranking

The risk rating for each hazard was calculated by multiplying the probability factor by the sum of the weighted impact factors for people, property, and operations, as summarized in Table 12-5.

A priority of high, medium, or low was assigned to each hazard based on these ratings. The hazard ranked as being of highest concern is earthquake. Hazards ranked as being of medium concern are severe weather, wildfire, flood, landslide, and tsunami. The hazards ranked as being of lowest concern are dam failure and drought. Table 12-6 shows the hazard risk ranking.

### TABLE 12-5. HAZARD RISK RATING

<table>
<thead>
<tr>
<th>Hazard Event</th>
<th>Probability Factor</th>
<th>Sum of Weighted Impact Factors</th>
<th>Total (Probability x Impact)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dam failure^a</td>
<td>1</td>
<td>(6+4+2) = 12</td>
<td>12</td>
</tr>
<tr>
<td>Drought^b</td>
<td>3</td>
<td>(0+0+1) = 1</td>
<td>3</td>
</tr>
<tr>
<td>Earthquake</td>
<td>3</td>
<td>(9+6+1) = 16</td>
<td>48</td>
</tr>
<tr>
<td>Flood^c</td>
<td>3</td>
<td>(3+2+1) = 6</td>
<td>18</td>
</tr>
<tr>
<td>Landslide</td>
<td>3</td>
<td>(3+2+1) = 6</td>
<td>18</td>
</tr>
<tr>
<td>Severe weather</td>
<td>3</td>
<td>(6+4+1) = 11</td>
<td>33</td>
</tr>
<tr>
<td>Tsunami</td>
<td>3</td>
<td>(3+2+1) = 6</td>
<td>18</td>
</tr>
<tr>
<td>Wildfire</td>
<td>3</td>
<td>(3+2+2) = 7</td>
<td>21</td>
</tr>
</tbody>
</table>
**Table 12-6. Hazard Risk Ranking**

<table>
<thead>
<tr>
<th>Hazard Ranking</th>
<th>Hazard Event</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Earthquake</td>
<td>High</td>
</tr>
<tr>
<td>2</td>
<td>Severe weather</td>
<td>Medium</td>
</tr>
<tr>
<td>3</td>
<td>Wildfire</td>
<td>Medium</td>
</tr>
<tr>
<td>4</td>
<td>Flood</td>
<td>Medium</td>
</tr>
<tr>
<td>4</td>
<td>Landslide</td>
<td>Medium</td>
</tr>
<tr>
<td>4</td>
<td>Tsunami</td>
<td>Medium</td>
</tr>
<tr>
<td>5</td>
<td>Dam failure</td>
<td>Low</td>
</tr>
<tr>
<td>6</td>
<td>Drought</td>
<td>Low</td>
</tr>
</tbody>
</table>
SECTION 3: MITIGATION STRATEGY
Chapter 1.
Goals and Objectives

Hazard mitigation plans must identify goals for reducing long-term vulnerabilities to the hazards identified, as outlined in 44 Code of Federal Regulations (CFR) Section 201.6(c)(3)(i). As part of the planning process, the Steering Committee reviewed the goals and objectives of the 2010 plan. After discussion, the committee concluded that the goals and objectives should be revisited and revised to more fully align with other community objectives and priorities. Through several facilitated discussions and exercises, the Steering Committee established an updated set of goals and measurable objectives for the hazard mitigation plan, as well as guiding principles. The resulting guiding principles, goals, objectives, and initiatives in this plan update all support each other. Goals were selected based on their relevance and connection to other planning efforts. Objectives were selected that met multiple goals. Mitigation initiatives were prioritized based on the initiative meeting multiple objectives.

1.1 Guiding Principles

A guiding principle focuses the range of objectives and actions to be considered. A guiding principle is not a goal because it does not describe a hazard mitigation outcome and it is broader than a hazard-specific objective. The guiding principles for the San Mateo County Hazard Mitigation Plan are as follows:

1. Provide a dynamic, actionable approach to hazard planning that integrates with other planning mechanisms to enhance or support hazard mitigation.
2. Invite and enhance the public’s awareness and understanding of hazards.
3. Create a decision making tool for policy and decision makers.
4. Promote compliance with State and Federal Program requirements.
5. Assure inter-jurisdictional coordination on hazard mitigation activities.
6. Integrate the concepts of climate change into the mitigation planning process.
7. Support economic viability after a hazard event.

1.2 Goals

The following are the mitigation goals for this plan:

1. Protect life and property;
2. Provide information to residents to better understand the hazards of the region and ways to reduce their personal vulnerability to those hazards;
3. Promote hazard mitigation as an integrated public policy and as a standard business practice;
4. Increase resilience of infrastructure and critical facilities;
5. Protect the environment;
6. Develop and implement mitigation strategies that use public funds in an efficient and cost-effective way; and,
7. Improve community emergency management capability.

The effectiveness of a mitigation strategy is determined by how well these goals are achieved.

1.3 Objectives

Each selected objective meets multiple goals, serving as a stand-alone measurement of the effectiveness of a mitigation action, rather than as a subset of a goal. The objectives also are used to help establish priorities. The objectives are as follows:

1. Improve understanding of the locations, potential impacts, and linkages among threats, hazards, vulnerability, and measures needed to protect life safety and health.
2. Establish and maintain partnerships among all levels of government, the private sector, community groups, and institutions of higher learning that improve and implement methods to protect life and property.
3. Develop and provide updated information about threats, hazards, vulnerabilities, and mitigation strategies to state, regional, and local agencies, as well as private-sector groups.
4. Encourage incorporation of mitigation measures into repairs, major alterations, new development, and redevelopment practices, especially in areas subject to substantial hazard risk.
5. Promote and implement hazard mitigation plans and projects that are consistent with state, regional, and local climate action and adaptation goals, policies, and programs.
6. Advance community resilience through preparation, adoption, and implementation of state, regional, and local multi-hazard mitigation plans and projects.
7. Encourage life and property protection measures for all communities and structures located in hazard areas.
8. Actively promote effective coordination of regional and local hazard mitigation planning and action among state agencies, cities, counties, special districts, tribal organizations, councils of governments, metropolitan planning organizations, and regional transportation to create resilient and sustainable communities.
9. Improve systems that provide warning and emergency communications.
11. Retrofit, purchase, or relocate structures in high hazard areas, especially those known to be repetitively damaged.
Chapter 2.
Mitigation Alternatives

Catalogs of hazard mitigation alternatives were developed that present a broad range of alternatives to be considered for use in the planning area, in compliance with 44 CFR (Section 201.6(c)(3)(ii)). One catalog was developed for each hazard of concern evaluated in this plan. The catalogs for each hazard are listed in Tables 2-1 through Table 2-9. The catalogs present alternatives that are categorized in two ways:

- By what the alternative would do:
  - Manipulate a hazard
  - Reduce exposure to a hazard
  - Reduce vulnerability to a hazard
  - Increase the ability to respond to or be prepared for a hazard

- By who would have responsibility for implementation:
  - Individuals
  - Businesses
  - Government

Hazard mitigation initiatives recommended in this plan were selected from among the alternatives presented in the catalogs. The catalogs provide a baseline of mitigation alternatives that are backed by a planning process, are consistent with the planning partners’ goals and objectives, and are within the capabilities of the partners to implement. Additionally, the ABAG action items from the 2010 initiative were reviewed and incorporated in the alternatives list. These items are represented in **bold print** in the tables below.

Some of these actions may not be feasible based on the selection criteria identified for this plan. The purpose of the catalog was to equip the planning partners with a list of what could be considered to reduce risk of the hazards within the planning area. All actions identified in Volume 2 of this plan were selected based on the selection criteria described in Chapter 1 of Volume 2.

<table>
<thead>
<tr>
<th><strong>TABLE 2-1. CATALOG OF MITIGATION ALTERNATIVES—DAM FAILURE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal Scale</strong></td>
</tr>
<tr>
<td>Manipulate Hazard</td>
</tr>
<tr>
<td>- None</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Reduce Exposure</td>
</tr>
<tr>
<td>- Relocate out of dam failure inundation areas.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Reduce Vulnerability</td>
</tr>
</tbody>
</table>
### Table 2-1. Catalog of Mitigation Alternatives—Dam Failure

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Elevate home to appropriate levels.</td>
<td>• Flood-proof facilities within dam failure inundation areas</td>
<td>• Adopt higher regulatory floodplain standards in mapped dam failure inundation areas.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Retrofit critical facilities within dam failure inundation areas.</td>
</tr>
</tbody>
</table>

**Increase Preparation or Response Capability**

- • Learn about risk reduction for the dam failure hazard.
- • Learn the evacuation routes for a dam failure event.
- • Educate yourself on early warning systems and the dissemination of warnings.

- • Educate employees on the probable impacts of a dam failure.
- • Develop a continuity of operations plan.

- • Map dam failure inundation areas.
- • Enhance emergency operations plan to include a dam failure component.
- • Institute monthly communications checks with dam operators.
- • Inform the public on risk reduction techniques
- • Adopt real-estate disclosure requirements for the re-sale of property located within dam failure inundation areas.
- • Consider the probable impacts of climate in assessing the risk associated with the dam failure hazard.
- • Establish early warning capability downstream of listed high hazard dams.
- • Consider the residual risk associated with protection provided by dams in future land use decisions.

### Table 2-2. Catalog of Mitigation Alternatives—Drought

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manipulate Hazard</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• None</td>
<td>• None</td>
<td>• Groundwater recharge through stormwater management</td>
</tr>
</tbody>
</table>

| **Reduce Exposure** | | |
| • None | • None | • Identify and create groundwater backup sources |

| **Reduce Vulnerability** | | |
| • Drought-resistant landscapes | • Drought-resistant landscapes | • Water use conflict regulations |
| • Reduce water system losses | • Reduce private water system losses | • Reduce water system losses |
| • Modify plumbing systems (through water saving kits) | | • Distribute water saving kits |

| **Increase Preparation or Response Capability** | | |
| • Practice active water conservation | • Practice active water conservation | • Public education on drought resistance |
| | | • Identify alternative water supplies for times of drought; mutual aid agreements with alternative suppliers |
| | | • Develop drought contingency plan |
| | | • Develop criteria “triggers” for drought-related actions |
| | | • Improve accuracy of water supply forecasts |
| | | • Modify rate structure to influence active water conservation techniques |
### TABLE 2-3. CATALOG OF MITIGATION ALTERNATIVES—EARTHQUAKE

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manipulate Hazard</strong></td>
<td>• None</td>
<td>• None</td>
</tr>
<tr>
<td><strong>Reduce Exposure</strong></td>
<td>• Locate outside of hazard area (off soft soils)</td>
<td>• Locate critical facilities or functions outside hazard area where possible</td>
</tr>
<tr>
<td></td>
<td>• Locate or relocate mission-critical functions outside hazard area where possible</td>
<td></td>
</tr>
<tr>
<td><strong>Reduce Vulnerability</strong></td>
<td>• Retrofit structure (anchor house structure to foundation)</td>
<td>• Harden infrastructure</td>
</tr>
<tr>
<td></td>
<td>• Secure household items that can cause injury or damage (such as water heaters, bookcases, and other appliances)</td>
<td>• Provide redundancy for critical functions</td>
</tr>
<tr>
<td></td>
<td>• Build to higher design</td>
<td>• Adopt higher regulatory standards</td>
</tr>
<tr>
<td></td>
<td>• Retrofit critical buildings and areas housing mission-critical functions</td>
<td>• Install earthquake-resistant connections when pipes enter and exit bridges.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Install specially-engineered pipelines in areas subject to faulting, liquefaction, earthquake-induced landsliding, or other earthquake hazard.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Increase Preparation or Response Capability</strong></td>
<td>• Practice “drop, cover, and hold”</td>
<td>• Provide better hazard maps</td>
</tr>
<tr>
<td></td>
<td>• Develop household mitigation plan, such as creating a retrofit savings account, communication capability with outside, 72-hour self-sufficiency during an event</td>
<td>• Provide technical information and guidance</td>
</tr>
<tr>
<td></td>
<td>• Keep cash reserves for reconstruction</td>
<td>• Enact tools to help manage development in hazard areas (such as tax incentives, information)</td>
</tr>
<tr>
<td></td>
<td>• Become informed on the hazard and risk reduction alternatives available.</td>
<td>• Include retrofitting and replacement of critical system elements in capital improvement plan</td>
</tr>
<tr>
<td></td>
<td>• Develop a post-disaster action plan for your household</td>
<td>• Develop strategy to take advantage of post-disaster opportunities</td>
</tr>
<tr>
<td></td>
<td>• Adopt higher standard for new construction; consider “performance-based design” when building new structures</td>
<td>• Warehouse critical infrastructure components such as pipe, power line, and road repair materials</td>
</tr>
<tr>
<td></td>
<td>• Keep cash reserves for reconstruction</td>
<td>• Develop and adopt a continuity of operations plan</td>
</tr>
<tr>
<td></td>
<td>• Inform your employees on the possible impacts of earthquake and how to deal with them at your work facility.</td>
<td>• Initiate triggers guiding improvements (such as &lt;50 percent substantial damage or improvements)</td>
</tr>
<tr>
<td></td>
<td>• Develop a continuity of operations plan</td>
<td>• Further enhance seismic risk assessment to target high hazard buildings for mitigation opportunities</td>
</tr>
<tr>
<td></td>
<td>• Provide better hazard maps</td>
<td>• Develop a post-disaster action plan that includes grant funding and debris removal components</td>
</tr>
<tr>
<td></td>
<td>• Provide technical information and guidance</td>
<td>• Install portable facilities (such as hoses, pumps, emergency generators, or other equipment) to allow pipelines to bypass failure zones such as fault rupture areas, areas of liquefaction, and other ground failure areas (using a priority scheme if necessary)</td>
</tr>
</tbody>
</table>
### Table 2-3. Catalog of Mitigation Alternatives—Earthquake

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>funds are not available for installation at all needed locations.</td>
</tr>
</tbody>
</table>

### Table 2-4. Catalog of Mitigation Alternatives—Flood

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manipulate Hazard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Clear stormwater drains and culverts</td>
<td>• Clear stormwater drains and culverts</td>
<td>• Maintain drainage system</td>
</tr>
<tr>
<td>• Institute low-impact development techniques on property</td>
<td>• Institute low-impact development techniques on property</td>
<td>• Institute low-impact development techniques on property</td>
</tr>
<tr>
<td>Reduce Exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Locate outside of hazard area</td>
<td>• Locate business critical facilities or functions outside hazard area</td>
<td>• Locate or relocate critical facilities outside of hazard area</td>
</tr>
<tr>
<td>• Elevate utilities above base flood elevation</td>
<td>• Institute low impact development techniques on property</td>
<td>• Acquire or relocate identified repetitive loss properties</td>
</tr>
<tr>
<td>• Institute low impact development techniques on property</td>
<td>• Harden/upgrade levee system</td>
<td>• Promote open space uses in identified high hazard areas via techniques such as: planned unit developments, easements, setbacks, greenways, and sensitive area tracks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Adopt land development criteria such as planned unit developments, density transfers, clustering</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Institute low impact development techniques on property</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff</td>
</tr>
<tr>
<td>Reduce Vulnerability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Retrofit structures (elevate structures above base flood elevation)</td>
<td>• Build redundancy for critical functions or retrofit critical buildings</td>
<td>• Harden infrastructure, bridge replacement program</td>
</tr>
<tr>
<td>• Elevate items within house above base flood elevation</td>
<td>• Provide flood-proofing measures when new critical infrastructure must be located in floodplains</td>
<td>• Provide redundancy for critical functions and infrastructure</td>
</tr>
<tr>
<td>• Build new homes above base flood elevation</td>
<td></td>
<td>• Adopt appropriate regulatory standards, such as: increased freeboard standards, cumulative substantial improvement or damage, lower substantial damage threshold; compensatory storage, non-conversion deed restrictions.</td>
</tr>
</tbody>
</table>
### TABLE 2-4. CATALOG OF MITIGATION ALTERNATIVES—FLOOD

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Flood-proof existing structures</td>
<td></td>
<td>• Stormwater management regulations and master planning.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Adopt “no-adverse impact“ floodplain management policies that strive to not increase the flood risk on downstream communities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Investigate ways to reduce coastal erosion vulnerability, especially in Pacifica and the unincorporated Midcoast area.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>Conduct a watershed analysis of runoff and drainage systems to predict areas of insufficient capacity in the storm drain and natural creek system.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Develop procedures for performing a watershed analysis to look at the impact of development on flooding potential downstream, including communities outside of the jurisdiction of proposed projects.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Elevate critical bridges affected by flooding to increase stream flow and maintain critical access and egress routes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Place remote sensors in strategic locations for early warning of hazmat releases or use of weapons of mass destruction.</td>
</tr>
</tbody>
</table>

**Increase Preparation or Response Capability**

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Buy flood insurance</td>
<td>Keep cash reserves for reconstruction</td>
<td>Produce better hazard maps</td>
</tr>
<tr>
<td>• Develop household mitigation plan, such as retrofit savings, communication capability with outside, 72-hour self-sufficiency during and after an event</td>
<td>Support and implement hazard disclosure for the sale/re-sale of property in identified risk zones.</td>
<td>Provide technical information and guidance</td>
</tr>
<tr>
<td>• Develop household evacuation plan (coastal erosion in Pacifica only)</td>
<td>Solicit cost-sharing through partnerships with other stakeholders on projects with multiple benefits.</td>
<td>Enact tools to help manage development in hazard areas (stronger controls, tax incentives, and information)</td>
</tr>
</tbody>
</table>

---

**Notes:**
- San Mateo County Hazard Mitigation Plan
- Section 3 - Chapter 2
- Mitigation Alternatives

---

**Attachment:** San Mateo HMP - Volume I - Final Revised (2013 : Resolution Adopting the SMC Hazard Mitigation Plan Update)
### TABLE 2-4. CATALOG OF MITIGATION ALTERNATIVES—FLOOD

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>• Integrate floodplain management policies into other planning mechanisms within the planning area.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Consider the probable impacts of climate change on the risk associated with the flood hazard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Consider the residual risk associated with structural flood control in future land use decisions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enforce National Flood Insurance Program</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Adopt a Stormwater Management Master Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Develop a comprehensive streambed vegetation management plan.</td>
</tr>
</tbody>
</table>

### TABLE 2-5. CATALOG OF MITIGATION ALTERNATIVES—LANDSLIDE

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manipulate Hazard</strong></td>
<td>• Stabilize slope (dewater, armor toe)</td>
<td>• Stabilize slope (dewater, armor toe)</td>
</tr>
<tr>
<td></td>
<td>• Reduce weight on top of slope</td>
<td>• Reduce weight on top of slope</td>
</tr>
<tr>
<td></td>
<td>• Minimize vegetation removal and the addition of impervious surfaces.</td>
<td></td>
</tr>
<tr>
<td><strong>Reduce Exposure</strong></td>
<td>• Locate structures outside of hazard area (off unstable land and away from slide-runout area)</td>
<td>• Acquire properties in high-risk landslide areas.</td>
</tr>
<tr>
<td></td>
<td>• Locate structures outside of hazard area (off unstable land and away from slide-runout area)</td>
<td>• Adopt land use policies that prohibit the placement of habitable structures in high-risk landslide areas.</td>
</tr>
<tr>
<td><strong>Reduce Vulnerability</strong></td>
<td>• Retrofit home.</td>
<td>• Adopt higher regulatory standards for new development within unstable slope areas.</td>
</tr>
<tr>
<td></td>
<td>• Retrofit at-risk facilities.</td>
<td>• Armor/retrofit critical infrastructure against the impact of landslides.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Establish requirements in zoning ordinances to address hillside development constraints, especially in areas of existing landslides.</td>
</tr>
<tr>
<td><strong>Increase Preparation or Response Capability</strong></td>
<td>• Institute warning system, and develop evacuation plan</td>
<td>• Produce better hazard maps</td>
</tr>
<tr>
<td></td>
<td>• Keep cash reserves for reconstruction</td>
<td>• Provide technical information and guidance</td>
</tr>
<tr>
<td></td>
<td>• Educate yourself on risk reduction</td>
<td>• Enact tools to help manage development in hazard areas: better land controls, tax incentives, information</td>
</tr>
<tr>
<td></td>
<td>• Develop evacuation plan</td>
<td>• Develop strategy to take advantage of post-disaster opportunities</td>
</tr>
<tr>
<td></td>
<td>• Keep cash reserves for reconstruction</td>
<td>• Warehouse critical infrastructure components</td>
</tr>
</tbody>
</table>
### TABLE 2-5. CATALOG OF MITIGATION ALTERNATIVES—LANDSLIDE

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
</table>
| techniques for landslide hazards. | • Educate employees on the potential exposure to landslide hazards and emergency response protocol. | • Develop and adopt a continuity of operations plan  
• Educate the public on the landslide hazard and appropriate risk reduction alternatives. |

### TABLE 2-6. CATALOG OF MITIGATION ALTERNATIVES—SEVERE WEATHER

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manipulate Hazard</td>
<td>• None</td>
<td>• None</td>
</tr>
<tr>
<td>Reduce Exposure</td>
<td>• None</td>
<td>• None</td>
</tr>
</tbody>
</table>
| Reduce Vulnerability | • Insulate house  
• Provide redundant heat and power  
• Insulate structure  
• Plant appropriate trees near home and power lines (“Right tree, right place” National Arbor Day Foundation Program) | • Relocate critical infrastructure (such as power lines) underground  
• Reinforce or relocate critical infrastructure such as power lines to meet performance expectations  
• Install tree wire  
• Ensure air-conditioned facilities for institutionalized vulnerable populations. | • Harden infrastructure such as locating utilities underground  
• Trim trees back from power lines  
• Designate snow routes and strengthen critical road sections and bridges  
• Provide publicly available cooling centers.  
• Disseminate information on public health impacts of severe weather. |
| Increase Preparation or Response Capability | • Trim or remove trees that could affect power lines  
• Promote 72-hour self-sufficiency  
• Obtain a NOAA weather radio.  
• Obtain an emergency generator. | • Trim or remove trees that could affect power lines  
• Create redundancy  
• Equip facilities with a NOAA weather radio  
• Equip vital facilities with emergency power sources. | • Support programs such as “Tree Watch” that proactively manage problem areas through use of selective removal of hazardous trees, tree replacement, etc.  
• Establish and enforce building codes that require all roofs to withstand snow loads  
• Increase communication alternatives  
• Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors.  
• Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines  
• Provide NOAA weather radios to the public.  
• Develop an extreme heat program. |
### Table 2-6. Catalog of Mitigation Alternatives—Severe Weather

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Have back-up emergency power available for critical intersection traffic lights.</strong></td>
</tr>
</tbody>
</table>

### Table 2-7. Catalog of Mitigation Alternatives—Tsunami

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manipulate Hazard</strong></td>
<td><strong>Clear stormwater drains and culverts in inundation zones</strong></td>
<td><strong>Clear stormwater drains and culverts in inundation zones</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Maintain drainage system in inundation zones</strong></td>
<td><strong>Structural flood control, levees, channelization, or revetments</strong></td>
</tr>
<tr>
<td><strong>Reduce Exposure</strong></td>
<td><strong>Locate mission critical functions outside of hazard area, such as inundation zones whenever possible.</strong></td>
<td><strong>Locate critical facilities and functions outside of hazard area, such as inundation zones, whenever possible.</strong></td>
</tr>
<tr>
<td><strong>Reduce Vulnerability</strong></td>
<td><strong>Avoid close proximity to San Francisco Bay for several days after the tsunami (to avoid seiche hazards)</strong></td>
<td><strong>Maintain up to date with current tsunami warning technologies</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Elevate items within house above base flood elevation</strong></td>
<td><strong>Revise building codes and guidelines to adequately address the impacts of tsunamis on structures.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Flood-proof existing structures</strong></td>
<td><strong>Harden infrastructure, bridge replacement program</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Provide redundancy for critical functions and infrastructure</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Harden and flood-proof critical facilities in inundation zones to the greatest extent practicable</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Recommend that residents avoid close proximity to San Francisco Bay for several days after the tsunami (to avoid seiche hazards)</strong></td>
</tr>
<tr>
<td><strong>Increase Preparation or Response Capability</strong></td>
<td><strong>Develop and practice a corporate evacuation plan</strong></td>
<td><strong>Regularly update tsunami inundation maps with probabilistic scenarios and to take into account emerging technology resources.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Inform employees through corporate sponsored outreach</strong></td>
<td><strong>Revise building codes and guidelines to adequately address the impacts of tsunamis on structures.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Keep cash reserves for reconstruction</strong></td>
<td><strong>Incorporate retrofitting or replacement of critical system elements in capital improvement plan</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Support and implement hazard disclosure for the</strong></td>
<td><strong>Develop and implement a public information strategy, with a focus on vulnerable populations</strong></td>
</tr>
</tbody>
</table>
### Table 2-7. Catalog of Mitigation Alternatives—Tsunami

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>sale/re-sale of property in identified risk zones.</td>
<td>• Solicit cost-sharing through partnerships with other stakeholders on projects with multiple benefits.</td>
</tr>
</tbody>
</table>

### Table 2-8. Catalog of Mitigation Alternatives—Wildfire

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manipulate Hazard</td>
<td>• Clear potential fuels on property such as dry overgrown underbrush and diseased trees</td>
<td>• Clear potential fuels on property such as dry underbrush and diseased trees • Implement best management practices on public lands.</td>
</tr>
<tr>
<td>Reduce Exposure</td>
<td>• Create and maintain defensible space around structures • Locate outside of hazard area • Mow regularly</td>
<td>• Create and maintain defensible space around structures and infrastructure • Locate outside of hazard area • Enhance building code to include use of fire resistant materials in high hazard area.</td>
</tr>
<tr>
<td>Reduce Vulnerability</td>
<td>• Create and maintain defensible space around structures and provide water on site • Use fire-retardant building materials • Create defensible spaces around home</td>
<td>• Create and maintain defensible space around structures and infrastructure • Use fire-retardant building materials • Use fire-resistant plantings in buffer areas of high wildfire threat. • Consider higher regulatory standards (such as Class A roofing) • Establish biomass reclamation initiatives</td>
</tr>
<tr>
<td>Increase Preparation or Response Capability</td>
<td>• Employ techniques from the National Fire Protection Association’s Firewise Communities program to safeguard home • Identify alternative water supplies for firefighting</td>
<td>• Support Firewise community initiatives. • Create/establish stored water supplies to be utilized for firefighting. • More public outreach and education efforts, including an active Firewise program • Possible weapons of mass destruction funds available to enhance fire capability in high-risk areas • Identify fire response and alternative evacuation routes • Seek alternative water supplies • Become a Firewise community</td>
</tr>
</tbody>
</table>
### Table 2-8. Catalog of Mitigation Alternatives—Wildfire

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Install/replace roofing material with non-combustible roofing materials.</td>
<td></td>
<td>• Use academia to study impacts/solutions to wildfire risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Establish/maintain mutual aid agreements between fire service agencies.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Create/implement fire plans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Consider the probable impacts of climate change on the risk associated with the wildfire hazard in future land use decisions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>Develop unused or pedestrian rights-of-way as walkways to serve as additional evacuation routes.</strong></td>
</tr>
</tbody>
</table>

### Table 2-9. Catalog of Mitigation Alternatives—Human-Caused Hazards

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manipulate Hazard</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Practice safe traveling procedures (for example, don’t drive while tired or intoxicated)</td>
<td>• Promote a culture of health and safety to reduce risks of transportation accidents from travel fatigue or other concerns</td>
<td>• Promote a culture of health and safety to reduce risks of transportation accidents from travel fatigue or other concerns</td>
</tr>
<tr>
<td></td>
<td>• Continuously look to the use of safer alternative products to conduct transport operations.</td>
<td>• Continuously look to the use of safer alternative products to conduct transport operations.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Have police and emergency responders work with appropriate regional, state, and federal agencies to share information, identify threats, and respond to potential incidents to reduce criminal activity attempts and other threats.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>Provide information on hazardous waste disposal and/or drop off locations.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>Remove septic tanks and other sources of contamination adjacent to economically-significant aquacultural and agricultural resources.</strong></td>
</tr>
<tr>
<td><strong>Reduce Exposure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Relocate away from high-hazard areas</td>
<td>• Relocate critical or mission-essential facilities away from major highways and transportation corridors, as well as high-risk targets</td>
<td>• Relocate critical or mission-essential facilities away from major highways and transportation corridors, as well as high-risk targets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Harden critical infrastructure to the greatest extent possible</td>
</tr>
<tr>
<td><strong>Reduce Vulnerability</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 2-9. CATALOG OF MITIGATION ALTERNATIVES—HUMAN-CAUSED HAZARDS

<table>
<thead>
<tr>
<th>Personal Scale</th>
<th>Corporate Scale</th>
<th>Government Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Notify police or response personnel of suspicious activities.</td>
<td>• Properly placard and label containers, update emergency plans, and coordinate response procedures with San Mateo County and local jurisdictions</td>
<td>• Maintain visible police and emergency responder presence in sensitive and high-risk locations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Work proactively with hazardous materials (HazMat) facilities regarding placards and labeling of containers, emergency plans and coordination, standardized response procedures, notification of the types of materials being transported through San Mateo County on at least an annual basis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Random inspections of transporters as allowed by each company</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Installation of mitigating techniques along critical locations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Routine hazard communication initiatives</td>
</tr>
<tr>
<td><strong>Increase Preparation or Response Capability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Develop a family mitigation plan and an evacuation plan if living near a high-risk target or major highway/transportation corridor</td>
<td>• Participate in jurisdictional/City, County, state, federal, and other efforts to practice response capabilities, gather relevant hazard information (such as on terrorism), and monitor vulnerabilities.</td>
<td>• Participate in regional, state and federal efforts to gather terrorism information at all levels and keep public safety officials briefed at all times regarding any local threats. Staff will then further develop response capabilities based on emerging threats.</td>
</tr>
<tr>
<td></td>
<td>• Coordinate in information-sharing initiatives with the local cities and County</td>
<td>• Continue all facets of emergency preparedness training and exercises for Police, Fire, Public Works, and Manager/Public Information staff in order to respond quickly in the event of a human-caused disaster.</td>
</tr>
<tr>
<td></td>
<td>• Develop a Business Continuity Plan</td>
<td>• Participate in the Governor’s Office of Emergency Services Disaster Resistant California annual conference and other training sessions sponsored by regional, state and federal agencies.</td>
</tr>
<tr>
<td></td>
<td>• Review existing automatic/mutual aid agreements</td>
<td>• Utilize Crime Prevention through Environmental Design (CPTED) in future planning efforts as well as enhancing existing infrastructure and buildings to prevent or mitigate human-cause incidents.</td>
</tr>
<tr>
<td></td>
<td>• Adopt Information Technology and telecommunications recovery plans.</td>
<td>• Review existing automatic/mutual aid agreements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Maintain a regional around-the-clock emergency services information hotline for the public</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Coordinate with school districts to ensure emergency preparedness plans include human-caused incidents.</td>
</tr>
</tbody>
</table>

---

**San Mateo County Hazard Mitigation Plan**

**SECTION 3 - Chapter 2**

**Mitigation Alternatives**
Chapter 3.
Selected Countywide Mitigation Initiatives

Countywide hazard mitigation initiatives recommended in this plan were selected by the Steering Committee from among the alternatives presented in the mitigation catalog. Some of the initiatives identified in the mitigation catalog were determined not to be feasible or otherwise undesirable based on the selection criteria identified for this plan (such as lack of public support or a more cost-effective alternative is available). The Steering Committee reviewed and provided feedback on the catalog, ultimately selecting the countywide mitigation initiatives described in detail in the following sections. Those initiatives that have been chosen are backed by a planning process, are consistent with the established goals and objectives, and are within the capabilities of San Mateo County and its stakeholders to implement.

Table 3-1 lists each selected mitigation initiative, the lead agency for each, and appropriate implementation factors.

<table>
<thead>
<tr>
<th>Table 3-1. Hazard Mitigation Action Plan Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applies to New or Existing Assets</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td>New and existing</td>
</tr>
<tr>
<td>Action CW-1—Continue to support the countywide actions identified in this plan.</td>
</tr>
<tr>
<td>New and existing</td>
</tr>
<tr>
<td>Action CW-2—Actively participate in the plan maintenance strategy identified in this plan.</td>
</tr>
<tr>
<td>N/A</td>
</tr>
<tr>
<td>Action CW-3—Continue to maintain a website that will house the regional hazard mitigation plan, its progress reports and all component of the plan’s maintenance strategy to provide planning partners and public ongoing access to the plan and its implementation.</td>
</tr>
<tr>
<td>N/A</td>
</tr>
<tr>
<td>Action CW-4—Continue to leverage/support/enhance ongoing, regional public education and awareness programs (such as “CERT, multi-jurisdiction, etc.”) as a method to educate the public on risk, risk reduction, and community resilience.</td>
</tr>
<tr>
<td>N/A</td>
</tr>
<tr>
<td>Action CW-5—Provide technical support and coordination for available grant funding opportunities to the planning partnership.</td>
</tr>
<tr>
<td>N/A</td>
</tr>
</tbody>
</table>

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### Table 3-1. Hazard Mitigation Action Plan Matrix

<table>
<thead>
<tr>
<th>Applies to New or Existing Assets</th>
<th>Hazards Mitigated</th>
<th>Objectives Met</th>
<th>Lead Agencies</th>
<th>Estimated Cost</th>
<th>Sources of Funding</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Flood, severe weather, landslide</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 10</td>
<td>San Mateo County and Jurisdictions</td>
<td>High</td>
<td>HMGP, LCP Grants</td>
<td>Short-term</td>
</tr>
</tbody>
</table>

*a. Where applicable, certain actions will only pertain to municipalities within the planning area.

*b. Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.*

### 3.1.1 Benefit/Cost Review

The initiative plan must be prioritized according to a benefit/cost analysis of the proposed initiatives and their associated costs, outlined in 44 CFR, Section 201.6(c)(3)(iii). The benefits of proposed initiatives were weighed against estimated costs as part of the initiative prioritization process. The benefit/cost analysis was not of the detailed variety required by the Federal Emergency Management Agency (FEMA) for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. A less formal approach was used because some initiatives may not be implemented for up to 10 years and associated costs and benefits could change dramatically in that time. Therefore, the apparent benefits versus the apparent cost of each initiative was reviewed. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these initiatives.

The ratings of high, medium, and low are qualitative based solely on the comparison of one initiative to another. Implementation of an initiative should not be discouraged based on its identification as a low priority. All of the initiatives identified in the Hazard Mitigation Initiative Action Plan are and should be considered important steps to alleviate hazard impacts toward the people, property, and economy of San Mateo County.

Cost ratings were defined as follows:

- **High**—Existing funding will not cover the cost of the initiative; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).
- **Medium**—The initiative could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the initiative would have to be spread over multiple years.
- **Low**—The initiative could be funded under the existing budget. The initiative is part of or can be part of an ongoing existing program.

Benefit ratings were defined as follows:

- **High**—Initiative will provide an immediate reduction of risk exposure for life and property.
- **Medium**—Initiative will have a long-term impact on the reduction of risk exposure for life and property, or initiative will provide an immediate reduction in the risk exposure for property.
- **Low**—Long-term benefits of the initiative are difficult to quantify in the short term.
Using this approach, initiative with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, and so forth) are considered cost-beneficial and are prioritized accordingly.

Planning partners may seek financial assistance under the HMGP or PDM programs, both of which require detailed benefit/cost analyses, for many of the strategies identified in this initiative plan. These analyses will be performed on projects during the application process using the FEMA benefit-cost model. Planning partners reserve the right to define “benefits” according to parameters that meet the goals and objectives of this plan for projects that are not seeking financial assistance from grant programs that require detailed analysis.

### 3.1.2 Initiative Plan Prioritization

#### Implementation Prioritization

Table 3-2 lists the implementation priority of each initiative, using the same parameters used in selecting the initiatives. A qualitative benefit-cost review was performed for each of these initiatives. The priorities are defined as follows:

- **High Priority**—An initiative that meets multiple objectives, has benefits that exceed cost, has funding secured, or is an ongoing project and meets eligibility requirements for a grant program. High priority initiatives can be completed in the short term (1 to 5 years). The key factors for high priority initiatives are that they have funding secured and can be completed in the short term.

- **Medium Priority**—An initiative that meets goals and objectives, that has benefits that exceed costs, and for which funding has not been secured but that is grant eligible. Initiative can be completed in the short term, once funding is secured. Medium priority projects will become high priority projects once funding is secured. The key factors for medium priority initiatives are that they are eligible for funding, but do not yet have funding secured, and they can be completed within the short term.

- **Low Priority**—An initiative that will mitigate the risk of a hazard, that has benefits that do not exceed the costs or are difficult to quantify, for which funding has not been secured, that is not eligible for grant funding, and for which the time line for completion is long term (1 to 10 years). Low priority initiatives may be eligible for grant funding from other programs that have not yet been identified. Low priority projects are “blue-sky” projects. Financing is unknown, and they can be completed over a long term.

#### Grant Funding Prioritization

Table 3-2 also lists the grant funding priority of each initiative. The priorities are defined as follows:

- **High Priority**—An initiative that has been identified as meeting grant eligibility requirements, assessed to have high benefits, is listed as high or medium priority, and where local funding options are unavailable or where dedicated funds could be used for projects that are not eligible for grant funding.
Medium Priority—An initiative that has been identified as meeting grant eligibility requirements, assessed to have medium or low benefits, is listed as medium or low priority, and where local funding options are unavailable.

Low Priority—An initiative that has not been identified as meeting grant eligibility requirements or has low benefits.

Those initiatives identified as high-priority grant funding initiatives should be closely reviewed for consideration when grant funding opportunities arise.
## TABLE 3-2. PRIORITIZATION OF MITIGATION INITIATIVES

<table>
<thead>
<tr>
<th>Initiative #</th>
<th># of Objectives Met</th>
<th>Benefits</th>
<th>Costs</th>
<th>Do Benefits equal or exceed Costs?</th>
<th>Is project Grant eligible?</th>
<th>Can Project be funded under existing programs/budgets?</th>
<th>Implementation Priority</th>
<th>Grant Funding Priority</th>
</tr>
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<td>Medium</td>
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</tbody>
</table>

a. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these initiatives. The ratings of high, medium, and low are qualitative based solely on the comparison of one initiative to another. Implementation of an initiative should not be discouraged based on its identification as a low priority.
Chapter 4. Plan Adoption

A hazard mitigation plan must document that it has been formally adopted by the governing body of the jurisdiction requesting federal approval of the plan, as outlined in 44 CFR Section 201.6(c)(5). Disaster Mitigation Act of 2000 (DMA) compliance and its benefits cannot be achieved until the plan is adopted. This plan will be submitted for a pre-adopter review to the California Office of Emergency Services (Cal OES), FEMA Region IX, and the Insurance Services Office (ISO) before it is adopted. Once pre-adopter approval has been provided, San Mateo County and planning partners will formally adopt the plan. All planning partners understand that DMA compliance cannot be achieved until the plan is adopted. A copy of the sample resolution is provided in Figure 4-1. Copies of the resolution adopting this plan for all planning partners can be found in Appendix G of this volume.

The coordination of adoption by the planning partners may allow for the batching, or simultaneous submission, of formal adoption resolutions. The collection and submission of the first batch of resolutions will be coordinated by the Plan Implementation Lead, San Mateo County, and those jurisdictions that receive a formal adoption notice within the first 45 days of APA designation by FEMA. Subsequent resolutions may be batched and submitted by the Plan Implementation Lead as resolutions are received.
RESOLUTION NO. 2016-XX
A RESOLUTION OF THE
AUTHORIZING THE ADOPTION OF THE
SAN MATEO COUNTY HAZARD MITIGATION PLAN UPDATE

WHEREAS, all of San Mateo County has exposure to natural hazards that increase the risk to life, property, environment and the County’s economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster mitigation programs; and

WHEREAS, a coalition of San Mateo County, Cities, Towns and Special Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the San Mateo County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the ____________________________:

1.) Adopts in its entirety, Volume I and the introduction, chapter ____, the ______ jurisdictonal annex, and the appendices of Volume II of the San Mateo County Hazard Mitigation Plan Update (HMP).

2.) Will use the adopted and approved portions of the HMP to guide pre- and post-disaster mitigation of the hazards identified.

3.) Will coordinate the strategies identified in the HMP with other planning programs and mechanisms under its jurisdictional authority.

4.) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the HMP.

5.) Will help to promote and support the mitigation successes of all HMP Planning Partners.

PASSED AND ADOPTED on this __, ____, __, __ day of ____, 2016, by the following vote:

YES:
NO:
ABSENT:
ABSTAIN:

ATTEST: ____________________________  ____________________________
City Clerk, Mayor,
Chapter 5.
Plan Implementation and Maintenance Strategy

This chapter presents a multi-jurisdictional plan implementation and maintenance process (CRS Step 10 and 44 CFR Section 201.6(c)(4)) that includes the following:

- A section describing how San Mateo County and its participating stakeholders will implement the recommendations of this plan over its 5-year performance period.
- A process San Mateo County and its planning partners will use to incorporate the requirements of the mitigation plan into other planning mechanisms, such as general or capital improvement plans, when appropriate.
- A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan over the 5-year cycle.
- A discussion on how the community will continue public participation in the plan maintenance process.

This section details the formal process that will ensure that the San Mateo County Multi-Jurisdictional Hazard Mitigation Plan remains an active and relevant document and that the County and participating jurisdictions maintain their eligibility for applicable funding sources. It includes a schedule for monitoring and evaluating the Plan annually and producing an updated plan every five years. The plan’s format allows sections to be reviewed and updated when new data becomes available, resulting in a plan that will remain current.

5.1.1 Plan Implementation and Coordination

The effectiveness of the plan depends on its implementation and the incorporation of its action items into existing local plans, policies, and programs. Together, the action items in the plan provide a framework for activities that San Mateo County and its planning partners can implement over the next 5 years. The steering committee established goals and objectives and prioritized mitigation initiatives that will be implemented through existing plans, policies, and programs.

The San Mateo County Office of Emergency Services (OES) will have primary responsibility for overseeing the plan implementation and maintenance strategy. Plan implementation and evaluation, however, will be a shared responsibility among all members of the planning partnership and agencies identified as lead or primary points of contact in the mitigation action plans. (See jurisdictional annexes in Volume 2 of this plan.)

It is anticipated that when this plan has been completed, there will be interest among the lead agencies identified in the action plan in pursuing grant funding under FEMA hazard mitigation grant programs and other relevant programs. Given the competitive nature of these programs, coordination and careful planning among the agencies will ensure the highest degree of success in seeking grant funding.
The steering committee has chosen to elect a Plan Implementation Lead to clarify responsibilities and to streamline efforts. The Plan Implementation Lead will strive to:

- Coordinate with lead agencies and stakeholders in identifying and developing opportunities for implementation of mitigation projects through existing mechanisms;
- Monitor grant funding opportunities identified in this plan; and
- Notify lead agencies when such funding opportunities become available.

The Plan Implementation Lead will coordinate implementation planning sessions as needed and with enough lead time to plan for pursuing Hazard Mitigation Assistance funds, which typically open in March or April. Several meetings may be held throughout the year, with at least one meeting held to coordinate with the annual mitigation grant cycle. (See the Annual Report subsection for more information.) The objectives of these sessions will be to:

- Identify and refine projects that are recommendations of this plan so that eligible, well-planned, vetted projects can be submitted for consideration when funding opportunities arise,
- Identify and develop strategies for incorporating mitigation projects into existing budgets, schedules, and planning mechanisms; and
- Provide input for the annual progress report regarding the actions and decisions of the committee.

The OES principal point of contact for coordinating review and engaging planning partner points of contact will be the San Mateo County OES Fire Liaison; this position will be known as the Plan Implementation Lead. At the time this plan was published, the Plan Implementation Lead is:

Brad Hartzell, Battalion Chief  
North County Fire Authority  
San Mateo County OES Fire Liaison  
Operations Bureau – Emergency Planning Division  
400 County Center | Redwood City, CA 94063  
650-302-0807 | bhartzell@smcgov.org

5.1.2 Steering Committee

The hazard mitigation Steering Committee was a volunteer body that oversaw development of and made recommendations on key elements of the plan, including the implementation and maintenance strategy. It was the Steering Committee’s position that an oversight committee with representation similar to that of the steering committee should have an active role in the plan implementation and maintenance. Therefore, it is recommended that the steering committee remain a viable body involved in key elements of the plan implementation and maintenance strategy. The steering committee will be folded into the existing San Mateo Emergency Manager’s Association (EMA) Planning Committee; this new joint committee will be known as the Hazard Mitigation Working Group. The Hazard Mitigation Working Group will strive for representation from the planning partners, as well as other stakeholders. The Hazard Mitigation Working Group will use EMA meetings as a venue to discuss mitigation related activities and planning updates. EMA meetings are held...
quarterly, and hazard mitigation will be incorporated into every EMA meeting. The Plan Implementation Lead will coordinate with the OES Director and the EMA Planning Committee Lead in scheduling when reviews will occur.

This working group should strive to include representation from stakeholders in the planning area as well as the lead agencies identified. The hazard mitigation working group will work toward fulfilling the following three responsibilities:

- Coordinating project implementation,
- Reviewing the annual progress report, and
- Providing input to the Plan Implementation Lead on possible enhancements to be considered at the next update.

Future plan updates will be overseen by a steering committee similar to the one that participated in this plan development process, so keeping an interim working group intact will provide consistency and continued progress toward future updates.

**Annual Progress Report**

The Hazard Mitigation Working Group will also convene an annual working group meeting to evaluate the progress on the action plan during a 12-month performance period. This review will include items such as the following:

- Summary of any hazard events that occurred during the performance period and the impact of these events on the planning area;
- Review of mitigation success stories;
- Review of continuing public involvement;
- Brief discussion about why targeted strategies were not completed;
- Re-evaluation of the action plan to establish if the timeline for projects needs identified to be amended (such as changing a long-term project to a short-term one because of new funding);
- Recommendations for new projects;
- Changes in or potential for new funding options (grant opportunities); and
- The impact of any other planning programs or initiatives that involve hazard mitigation.

The steering committee has committed to preparing a progress report during the 2016 planning process. Participating planning partners are responsible for completing the template and forwarding this information to the Hazard Mitigation Working Group. The Hazard Mitigation Working Group will then prepare a formal annual report on the progress of the plan. This report should be used as follows:

- The reporting period will cover January to December of each reporting year;
- The Plan Implementation Lead will send out reminder e-mails to all planning partners no later than February 1 of each year;
Planning partners will submit their status updates and sections of the annual report no later than March 1 of each year;

- The Plan Implementation Lead, in conjunction with the Hazard Mitigation Working Group, will prepare the annual report, including planning partner information, no later than March 15 of each year;
- San Mateo County OES will be responsible for ensuring the report is posted on the San Mateo County website page dedicated to the hazard mitigation plan;
- The Plan Implementation Lead will provide the report to the local media through a press release;
- The Hazard Mitigation Working Group will use the information in the annual report to identify projects of interest for the following year and to apply for Hazard Mitigation Assistance (HMA) funds, including Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) grants; and
- The Hazard Mitigation Working Group will present to the San Mateo County Board of Supervisors and the planning partnership governing bodies to inform them of the progress of mitigation initiatives implemented during the reporting period.

Please note: Use of the progress report will be at the discretion of each planning partner. Annual progress reporting is not a requirement specified under 44 CFR; however, it may enhance the planning partnership’s opportunities for funding, including HMA (PDM, FMA, and Hazard Mitigation Grant Program [HMGP])). While failure to implement this component of the plan maintenance strategy will not jeopardize a planning partner’s compliance under the DMA, it may jeopardize its opportunity to partner and leverage funding opportunities with other planning partners. The Hazard Mitigation Working Group will follow up with planning partners that do not participate in the annual report as deemed necessary by the Plan Implementation Lead.

5.1.3 Plan Update

San Mateo County and its planning partners intends to update the hazard mitigation plan on a 5-year cycle from the date of initial plan adoption (Community Rating System [CRS] Step 10). This cycle may be accelerated to less than 5 years based on the following triggers:

- A federal disaster declaration that involves the planning area;
- A hazard event that causes loss of life; or
- A comprehensive update of the San Mateo General Plan or a participating planning partner’s general or comprehensive plan.

It will not be the intent of future updates to develop a complete new hazard mitigation plan for the planning area. The update will, at a minimum, include the following elements:

- The update process will be convened through a steering committee.
- The hazard risk assessment will be reviewed and, if necessary, updated using best available information and technologies.
The action plan will be reviewed and revised to account for any initiatives completed, dropped, or changed and to account for changes in the risk assessment or new policies identified under other planning mechanisms (such as the general plan).

- The draft update will be sent to appropriate agencies and organizations for comment.
- The public will be given an opportunity to comment on the update before it is adopted.
- Planning partnership governing bodies will adopt their portions of the updated plan.

### 5.1.4 Continuing Public Involvement

The public will continue to be apprised of the plan’s progress through the hazard mitigation plan website and by providing copies of annual progress reports to the media. The website will not only house the final plan; it will become the single point of access and accumulation for information regarding the overall plan and plan implementation. Copies of the plan will be distributed to the San Mateo County library system. When the future update processes is initiated, a new public involvement strategy will be initiated based on guidance from a new steering committee. This strategy will be based on the needs and capabilities of San Mateo County and its planning partners at the time of the update. At a minimum, this strategy will include the use of local media outlets within the planning area.

### 5.1.5 Incorporation into Other Planning Mechanisms

The information on hazard, risk, vulnerability, and mitigation contained in this plan is based on the best science and technology available at the time this plan was prepared. The San Mateo County General Plan, and the various planning partners’ general plans, are considered an integral part of the hazard mitigation plan. San Mateo County and participating planning partners, through adoption of a general plan, zoning ordinance, and other similar documents, have planned for the impacts of natural hazards. The plan development process provided the opportunity to review and expand on policies in these planning mechanisms. The general plan and the hazard mitigation plan are complementary documents that work together to achieve the goal of reducing risk exposure. An update to a general plan may trigger an update to the hazard mitigation plan, inclusive of jurisdiction-specific information. Specifically, current and future updates to county and municipal general plans, and other similar documents, will incorporate information provided on climate change into the general plan safety element, per Senate Bill 379.

San Mateo County and participating planning partners will create a linkage between the hazard mitigation plan and the general plan documents by identifying a mitigation initiative as such and giving that initiative a high priority. Other planning processes and programs to be coordinated with the recommendations of the hazard mitigation plan may include the following:

- Emergency response plans
- Natural hazard elements of community plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
Plan Implementation and Maintenance Strategy

- Landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Any additional plans as they are reviewed and updated during the performance period of this plan.

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information may be incorporated via the update process.
September 1, 2016

Mr. Bart Spencer  
Emergency Services Coordinator  
Central County Fire Department  
1399 Rollins Road  
Burlingame, CA 94010

Dear Mr. Spencer:

We have completed our review of the San Mateo County Hazard Mitigation Plan and have determined that this plan is eligible for final approval pending its adoption by San Mateo County and all participating jurisdictions. Please see the enclosed list of approvable pending adoption jurisdictions.

Formal adoption documentation must be submitted to the Regional office by the lead Jurisdiction within one calendar year of the date of this letter, or the entire plan must be updated and resubmitted for review. We will approve the plan upon receipt of the documentation of formal adoption.

If you have any questions regarding the planning or review processes, please contact Alison Kearns, Lead Community Planner, at (510) 627-7125 or by email at alison.kearns@fema.dhs.gov.

Sincerely,

Jeffrey D. Lusk  
Division Director  
Mitigation Division  
FEMA Region IX

Enclosure

cc: Marcia Sully, State Hazard Mitigation Officer, CA Governor’s Office of Emergency Services  
Jose Lara, Chief of Hazard Mitigation Planning, CA Governor’s Office of Emergency Services
Status of Participating Jurisdictions as of September 1, 2016

### Jurisdictions – Adopted and Approved

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### Jurisdictions – Approvable Pending Adoption

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</tr>
<tr>
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<td>6</td>
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<td>East Palo Alto, City of</td>
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<tr>
<td>17</td>
<td>Woodside, Town of</td>
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<tr>
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<td>Mid-Peninsula Water District</td>
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<td>Jefferson Union High School District</td>
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<td>Pacifica School District</td>
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<tr>
<td>26</td>
<td>San Mateo County Community College District</td>
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<td>Highlands Recreation District</td>
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### Jurisdictions – Not Available to Adopt

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SUBJECT:
Annual Report to City Council from the Economic Development Committee (EDC)

RECOMMENDED ACTION:
Receive and Accept the Annual Report from the Economic Development Committee, and provide direction on its activities.

ALTERNATIVE ACTION:
None.

STAFF CONTACT:
Anne Stedler
(650) 738-7402
stedlera@ci.pacifica.ca.us

BACKGROUND/DISCUSSION:
The Annual Report will be presented orally to the City Council this evening and identifies the work and considerations the Economic Development Committee (EDC) has undertaken in the past year and proposes for the coming year.

The EDC's work is defined by the objectives the City Council established for the Committee in its Resolution No. 27-2011:

1. Work with the City Manager, to review and develop plans to improve customer service in departments interfacing with current and potential Pacifica businesses;
2. Facilitate owners/operators in existing business districts to organize, develop and implement plans for improvement and business development; and
3. Devise and implement a plan for outreach and marketing of Pacifica to encourage business growth.

The EDC looks forward to Council's response to its second Annual Report, especially knowing that the City Council identified Economic Development as its top priority in FY 2015-16.

The EDC also wishes to convey its thanks to the City Council for the opportunity to serve, and wishes to state its appreciation for the time and support provided by Ex-Officio members Mayor Ervin and Mayor Pro Tem Digre.
The EDC also recognizes and thanks Pacífica Chamber of Commerce representative Victor Spano, and Chamber CEO Vickie Flores for their coordination and collaboration with the EDC.

**FISCAL IMPACT:**

Non. Fiscal impact of any recommendation initiated by the EDC would be addressed in the staff report for that initiative at the time it is brought forward for City Council review and action.

**ORIGINATED BY:**

City Manager's Office

**ATTACHMENT LIST:**

None. (TXT)
SUBJECT:
Resolution Authorizing Refunding of 2008 Certificates of Participation

STAFF CONTACT:
Lorenzo Hines Jr.
Assistant City Manager
650-738-7301
hinesl@ci.pacifica.ca.us

BACKGROUND/DISCUSSION:
In 2008, the City converted $19.8M in 2006 Auction Rate Certificates (a type of debt instrument) to Certificates of Participation (another type of debt instrument). This allowed the City to move the debt from a floating interest rate to a fixed interest rate. The 2006 COPs and 2008 COPs were issued to finance and refinance a variety of public improvements, including street improvements, police station improvements as well other financing charges.

We now propose to refund (or refinance) the 2008 Certificates of Participation, with remaining principal of $16.2M, at a lower interest rate. The 2008 Certificates of Participations (COP) have a final maturity of January 1, 2037 and coupons of 4.25% to 5.375%.

Similar to a home mortgage loan, when interest rates decline, the City can refinance these debt instruments at a lower interest rate. Based on market conditions the City will save approximately $3.3 million in debt service ($3.1 million on a net present value basis). Staff recommends structuring the refunding to take the majority of the debt service savings in FY 2017 through FY 2021. Annual savings during these years will be approximately $500,000 to $700,000 per year. Actual savings achieved will be dependent on bond market conditions at the time of sale. The final maturity date remains the same.

We reassembled the bond team used to refund or refinance the 2014 Wastewater bonds comprised of the following:

- Bond Counsel - Jones Hall LLP
- Financial Advisor - Backstrom McCarley Berry & Co., Inc.
- Underwriter - U.S. Bancorp
- Underwriter’s Counsel - Schiff Hardin LLP
- City Attorney - Burke, Williams & Sorenson LLP.

City staff also met with Standard & Poor’s rating agency earlier this summer. Based on the City’s strong financial performance and outlook, S&P has rated the 2016 COPs “AA-”. This is an exceptionally strong rating and represents a three notch upgrade from its prior rating.
The Council is being asked to approve the official bond documents that are attached so that the bonds can be sold while the interest rates remain low. With Council approval the 2016 COPs will be sold the week of September 20, 2016. Because the City of Pacifica Financing Authority was a party to the previous financing documents as well as the documents relating to the 2016 COPs, a companion resolution will be presented to the governing board of the Financing Authority for consideration.

The Preliminary Official Statement (POS) is the most important document for the members of the Council to review. The POS discloses information with respect to, among other things, the following:

(I) the estimated sources and uses of funds,
(ii) the purposes for which the proceeds will be used,
(ii) the terms relating to the bonds (final maturity, redemption terms, etc.),
(iv) the source of security for repayment, and
(v) information regarding the City’s finances.

While we cannot predict the future course of interest rates, there is some chance the Federal Reserve will start raising interest rates this year. Consequently, the staff believes it is fiscally prudent to take advantage of historically low rates and lock in the savings now.

**FISCAL IMPACT:**

With Council’s action tonight, staff expects significant savings resulting from the more favorable interest rate (approximately $2.7 million) and from the upgraded credit rating (approximately $400,000). The total savings are estimated at approximately $3.3 million in debt service ($3.1 million on a net present value basis). The actual savings will be reported at Council’s meeting on October 10, 2016, after the bond sale process is complete.

**COUNCIL ACTION REQUESTED:**

Adopt the resolution entitled "Resolution Of The City Council Of The City Of Pacifica Authorizing The Delivery And Sale Of Refunding Certificates Of Participation In The Maximum Principal Amount Of $17,500,000 To Refinance 2008 Certificates Of Participation, And Approving Related Documents And Actions"

**ORIGINATED BY:**

City Manager's Office

**ATTACHMENT LIST:**

Preliminary Official Statement  (PDF)
Trust Agreement  (PDF)
Escrow Agreement  (PDF)
Amended and Restated Lease Agmt  (PDF)
Amended and Restated Site Lease  (PDF)
Certificate Purchase Agreement  (PDF)
RESOLUTION NO. (ID # 2008)

RESOLUTION NO. ___

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PACIFICA AUTHORIZING THE DELIVERY AND SALE OF REFUNDING CERTIFICATES OF PARTICIPATION IN THE MAXIMUM PRINCIPAL AMOUNT OF $17,500,000 TO REFINANCE 2008 CERTIFICATES OF PARTICIPATION, AND APPROVING RELATED DOCUMENTS AND ACTIONS

WHEREAS, the City of Pacifica (the “City”) and the City of Pacifica Financing Authority (the “Authority”) have previously refinanced outstanding lease obligations of the City and provided financing for certain public capital improvements through the execution and delivery of Certificates of Participation (2008 Conversion of 2006 Auction Rate Certificates) in the aggregate original principal amount of $19,815,000 (the “2008 Certificates”); and

WHEREAS, the 2008 Certificates evidence lease payments which are payable by the City under a lease agreement dated as of August 1, 2008 (the “2008 Lease Agreement”), under which the City has agreed to lease certain property from the Authority; and

WHEREAS, the 2008 Certificates and the lease payment obligations of the City under the 2008 Lease Agreement are currently subject to prepayment on any date at a prepayment price equal to 102% of the principal amount thereof, and in order to realize debt service savings the City and the Authority wish to provide for the refinancing of the 2008 Certificates; and

WHEREAS, in order to provide funds to refinance the 2008 Certificates, the City and the Authority propose to amend and restate the 2008 Lease Agreement for the purpose of leasing and leasing back certain real property consisting generally of the Public Safety Building located at 2705 Coast Highway in the City and the Fairmont West Park (collectively, the “Leased Property”), and to enter into a Trust Agreement with U.S. Bank National Association, as trustee (the “Trustee”), under which the Trustee will execute and deliver 2016 Refunding Certificates of Participation (2008 Certificate Refinancing) in the aggregate principal amount of not to exceed $17,500,000 (the “Refunding Certificates”), each evidencing a direct, undivided fractional interest in the lease payments which are payable by the City as the rental for the Leased Property; and

WHEREAS, the City Council wishes at this time to authorize and approve all proceedings for the refinancing of the 2008 Certificates, the delivery and sale of the Refunding Certificates for such purpose, and all related documents and actions, in furtherance of the public purposes of the City;

NOW, THEREFORE, IT IS HEREBY RESOLVED by the City Council of the City of Pacifica as follows:

Section 1. Approval of Financing Plan and Related Documents. The City Council hereby approves the financing plan outlined above. To that end, the City Council hereby approves each of the following financing documents in substantially the respective forms on file with the City Clerk together with any changes therein or additions thereto deemed advisable by
the City Manager or the Assistant City Manager (each, an “Authorized Officer”), whose execution thereof shall be conclusive evidence of such approval:

- Amended and Restated Site Lease between the City as lessor and the Authority as lessee, under which the City leases the Leased Property to the Authority in consideration of the payment by the Authority to the City of an upfront site lease payment which is sufficient to provide funds to refinance the 2008 Certificates.

- Amended and Restated Lease Agreement between the Authority as lessor and the City as lessee, under which the Authority leases the Leased Property back to the City in consideration of the payment by the City of semiannual lease payments.

- Trust Agreement among the City, the Authority and the Trustee, whereby the Trustee agrees to execute and deliver the Refunding Certificates.

- Escrow Agreement between the City and U.S. Bank National Association, as escrow agent, providing for the establishment, investment and application of funds for the purpose of prepaying and refinancing the 2008 Certificates.

An Authorized Officer is authorized and directed for and in the name and on behalf of the City to execute and attest the final form of each of the foregoing documents. The schedule of lease payments attached to the Amended and Restated Lease Agreement shall correspond to the payments of principal and interest represented by the Refunding Certificates, to be determined upon the sale thereof as set forth in Section 2.

Section 2. Negotiated Sale of Refunding Certificates. The City Council hereby approves the sale of the Refunding Certificates on a negotiated basis to US Bancorp (the “Underwriter”), pursuant to the terms and provisions of a Certificate Purchase Agreement (the “Certificate Purchase Agreement”) among the City, the Authority and the Underwriter. An Authorized Officer is hereby authorized and directed to execute and deliver the Certificate Purchase Agreement for and in the name and on behalf of the City, in substantially the form on file with the City Clerk, with such changes therein, deletions therefrom and additions thereto as are approved by such Authorized Officer, whose execution thereof shall be conclusive evidence of such approval. The Refunding Certificates shall be sold at a true interest cost of not to exceed 4.25% per annum, and the amount of the Underwriter’s discount on the sale of the Refunding Certificates shall not exceed 1.00% of the par amount thereof. The City Council hereby authorizes the delivery and performance of the Certificate Purchase Agreement.

Section 3. Official Statement. The City Council hereby approves and deems final within the meaning of Rule 15c2-12 of the Securities Exchange Act of 1934 (the “Rule), the Preliminary Official Statement describing the Refunding Certificates in the form on file with the City Clerk. An Authorized Officer is hereby individually authorized, at the request of the Underwriter, to execute an appropriate certificate affirming the City Council’s determination that the Preliminary Official Statement has been deemed final within the meaning of such Rule. Distribution of the Preliminary Official Statement by the Underwriter to prospective purchasers of the Refunding Certificates is hereby approved. An Authorized Officer is hereby authorized and directed to approve any changes in or additions to a final form of said Official Statement, and the execution thereof by an Authorized Officer shall be conclusive evidence of approval of any such changes and additions. The City Council hereby authorizes the distribution of the Final
Official Statement by the Underwriter. The Final Official Statement shall be executed in the name and on behalf of the City by an Authorized Officer.

Section 4. Engagement of Professional Services. The City Council hereby approves the engagement for bond counsel and disclosure counsel services with the firm of Jones Hall, A Professional Law Corporation and the engagement of Backstrom McCarley Berry & Co., for financial advisory services, pursuant to the agreements between the City and each of said firms in the respective forms on file with the City Clerk. An Authorized Officer is hereby authorized and directed to execute each of such agreements in the name and on behalf of the City.

Section 5. Official Actions. The Mayor, the City Manager, the Assistant City Manager, the City Clerk and all other officers of the City are each authorized and directed in the name and on behalf of the City to make any and all assignments, certificates, requisitions, agreements, notices, consents, leases and other instruments of conveyance, warrants and other documents, including but not limited to an agreement which terminates prior documents recorded with respect to the 2008 Certificates, which they or any of them might deem necessary or appropriate in order to consummate any of the transactions contemplated by the agreements and documents approved under this Resolution. Whenever in this resolution any officer of the City is authorized to execute or countersign any document or take any action, such execution, countersigning or action may be taken on behalf of such officer by any person designated by such officer to act on his or her behalf in the case such officer is absent or unavailable.

Section 6. Effective Date. This Resolution shall take effect from and after the date of its passage and adoption.

PASSED AND ADOPTED at a regular meeting of the City Council on the 12th day of September, 2016, by the following called vote:
AYES:
NOES:
ABSENT:

__________________________
Sue Digre, Mayor

Attest:

__________________________
Kathy O'Connell, City Clerk

Approved as to Form:

__________________________
Michelle Marchetta Kenyon, City Attorney
RESOLUTION NO. ___

RESOLUTION OF THE BOARD OF DIRECTORS OF THE CITY OF PACIFICA FINANCING AUTHORITY AUTHORIZING THE DELIVERY AND SALE OF REFUNDING CERTIFICATES OF PARTICIPATION IN THE MAXIMUM PRINCIPAL AMOUNT OF $17,500,000 TO REFINANCE 2008 CERTIFICATES OF PARTICIPATION, AND APPROVING RELATED DOCUMENTS AND ACTIONS

WHEREAS, the City of Pacifica (the “City”) and the City of Pacifica Financing Authority (the “Authority”) have previously refinanced outstanding lease obligations of the City and provided financing for certain public capital improvements through the execution and delivery of Certificates of Participation (2008 Conversion of 2006 Auction Rate Certificates) in the aggregate original principal amount of $19,815,000 (the “2008 Certificates”); and

WHEREAS, the 2008 Certificates evidence lease payments which are payable by the City under a lease agreement dated as of August 1, 2008 (the “2008 Lease Agreement”), under which the City has agreed to lease certain property from the Authority; and

WHEREAS, the 2008 Certificates and the lease payment obligations of the City under the 2008 Lease Agreement are currently subject to prepayment on any date at a prepayment price equal to 102% of the principal amount thereof, and in order to realize debt service savings the City and the Authority wish to provide for the refinancing of the 2008 Certificates; and

WHEREAS, in order to provide funds to refinance the 2008 Certificates, the City and the Authority propose to amend and restate the 2008 Lease Agreement for the purpose of leasing and leasing back certain real property consisting generally of the Public Safety Building located at 2705 Coast Highway in the City and the Fairmont West Park (collectively, the “Leased Property”), and to enter into a Trust Agreement with U.S. Bank National Association, as trustee (the “Trustee”), under which the Trustee will execute and deliver 2016 Refunding Certificates of Participation (2008 Certificate Refinancing) in the aggregate principal amount of not to exceed $17,500,000 (the “Refunding Certificates”), each evidencing a direct, undivided fractional interest in the lease payments which are payable by the City as the rental for the Leased Property; and
WHEREAS, the Board of Directors wishes at this time to authorize and approve all proceedings for the refinancing of the 2008 Certificates, the delivery and sale of the Refunding Certificates for such purpose, and all related documents and actions, in furtherance of the public purposes of the Authority;

NOW, THEREFORE, IT IS HEREBY RESOLVED by the Board of Directors of the City of Pacifica Financing Authority as follows:

Section 1. Approval of Financing Plan and Related Documents. The Board of Directors hereby approves the financing plan outlined above. To that end, the Board of Directors hereby approves each of the following financing documents in substantially the respective forms on file with the Secretary together with any changes therein or additions thereto deemed advisable by the Executive Director, whose execution thereof shall be conclusive evidence of such approval:

- Amended and Restated Site Lease between the City as lessor and the Authority as lessee, under which the City leases the Leased Property to the Authority in consideration of the payment by the Authority to the City of an upfront site lease payment which is sufficient to provide funds to refinance the 2008 Certificates.

- Amended and Restated Lease Agreement between the Authority as lessor and the City as lessee, under which the Authority leases the Leased Property back to the City in consideration of the payment by the City of semiannual lease payments.

- Assignment Agreement between the Authority and the Trustee, under which the Authority assigns certain of its rights under the Amended and Restated Lease Agreement to the Trustee for the benefit of the owners of the Refunding Certificates.

- Trust Agreement among the City, the Authority and the Trustee, whereby the Trustee agrees to execute and deliver the Refunding Certificates.

The Executive Director is authorized and directed for and in the name and on behalf of the City to execute and attest the final form of each of the foregoing documents. The schedule of lease payments attached to the Amended and Restated Lease Agreement shall correspond to the payments of principal and interest represented by the Refunding Certificates, to be determined upon the sale thereof as set forth in Section 2.
Section 2. Negotiated Sale of Refunding Certificates. The Board of Directors hereby approves the sale of the Refunding Certificates on a negotiated basis to US Bancorp (the “Underwriter”), pursuant to the terms and provisions of a Certificate Purchase Agreement (the “Certificate Purchase Agreement”) among the City, the Authority and the Underwriter. The Executive Director is hereby authorized and directed to execute and deliver the Certificate Purchase Agreement for and in the name and on behalf of the Authority, in substantially the form on file with the Secretary, with such changes therein, deletions therefrom and additions thereto as are approved by the Executive Director, whose execution thereof shall be conclusive evidence of such approval. The Refunding Certificates shall be sold at a true interest cost of not to exceed 4.25% per annum, and the amount of the Underwriter’s discount on the sale of the Refunding Certificates shall not exceed 1.00% of the par amount thereof. The Board of Directors hereby authorizes the delivery and performance of the Certificate Purchase Agreement.

Section 3. Official Actions. The Chairman, the Executive Director, the Treasurer, the Secretary and all other officers of the Authority are each authorized and directed in the name and on behalf of the Authority to make any and all assignments, certificates, requisitions, agreements, notices, consents, leases and other instruments of conveyance, warrants and other documents, including but not limited to an agreement which terminates prior documents recorded with respect to the 2008 Certificates, which they or any of them might deem necessary or appropriate in order to consummate any of the transactions contemplated by the agreements and documents approved under this Resolution. Whenever in this resolution any officer of the Authority is authorized to execute or countersign any document or take any action, such execution, countersigning or action may be taken on behalf of such officer by any person designated by such officer to act on his or her behalf in the case such officer is absent or unavailable.

Section 4. Effective Date. This Resolution shall take effect from and after the date of its passage and adoption.
PASSED AND ADOPTED at a special meeting of the Board of Directors of the City of Pacifica Financing Authority on the 12th day of September, 2016, by the following called vote:

AYES:

NOES:

ABSENT:

Chairman

Attest:

Secretary

Approved as to Form:
Authority Counsel
NEW ISSUE -- FULL BOOK-ENTRY

S&P Global Ratings: "AA-" See "RATING" herein.

In the opinion of Jones Hall, A Professional Law Corporation, San Francisco, California, Special Counsel, subject, however to certain qualifications described herein, under existing law, the portion of lease payments designated as and comprising interest and received by the owners of the Certificates is excluded from gross income for federal income tax purposes and is not an item of tax preference for purposes of the federal alternative minimum tax imposed on individuals and corporations, although for the purpose of computing the alternative minimum tax imposed on certain corporations, such interest is taken into account in determining certain income and earning. In the further opinion of Special Counsel, such interest is exempt from California personal income taxes. See "TAX MATTERS".

$ ___________

2016 REFUNDING CERTIFICATES OF PARTICIPATION
Evidencing the Direct, Undivided Fractional Interests of the Owners Thereof in Lease Payments to be Made by the
CITY OF PACIFICA
(2008 Certificates Refinancing)

Dated: Date of Delivery Due: January 1, as shown on inside cover

Purpose. The captioned refunding certificates of participation (the "Certificates") are being executed and delivered to provide funds (i) to prepay and defease certain outstanding certificates of participation which were executed and delivered in 2008 for the purpose of financing and refinancing various municipal improvements of the City, and (ii) to pay certain costs of executing and delivering the Certificates. See "FINANCING PLAN" herein.

Security. The Certificates evidence direct, undivided fractional interests of the owners thereof in Lease Payments (defined herein) to be made by the City of Pacifica (the "City") for the use and occupancy of certain real property and improvements under a Lease Agreement dated as of October 1, 2016 (the "Lease Agreement"), between the City and the City of Pacifica Financing Authority, a California joint powers authority (the "Authority"). The Lease Payments will be payable from any source of available funds of the City, subject to the provisions of the Lease Agreement described herein regarding abatement and defeasance. The City is required under the Lease Agreement to take such action as may be necessary to include all Lease Payments coming due in each of its annual budgets during the term of the Lease Agreement and to make the necessary annual appropriations for all such Lease Payments. The semiannual Lease Payments payable under the Lease Agreement will comprise the interest and principal represented by the Certificates. The Certificates will be secured under a Trust Agreement dated as of October 1, 2016, among the Authority, the City, and U.S. Bank National Association, San Francisco, California, as trustee (the "Trustee"). Under an Assignment Agreement dated as of October 1, 2016, between the Authority and the Trustee, the Lease Payments will be irrevocably assigned to the Trustee for the benefit of the Owners of the Certificates. See "SECURITY AND SOURCES OF PAYMENT FOR THE CERTIFICATES." See also "RISK FACTORS."

Interest. Interest represented by the Certificates will be payable on January 1 and July 1 of each year, commencing January 1, 2017. See "THE CERTIFICATES."

Book-Entry Only. When executed and delivered, the Certificates will be registered in the name of Cede & Co., as nominee of The Depository Trust Company ("DTC"). DTC will act as securities depository of the Certificates. Ownership interests in the Certificates may be purchased in book-entry form only. Beneficial owners of Certificates will not receive physical certificates representing the Certificates purchased, but will receive a credit balance on the books of the nominees of such purchasers who are participants of DTC. See "THE CERTIFICATES -- Book-Entry Only System" and "APPENDIX F -- Book-Entry Only System."

Payments. Principal, premium, if any, and interest due with respect to the Certificates will be paid by the Trustee to DTC, which will in turn remit those payments to its participants for subsequent disbursement to the beneficial owners of the Certificates as described in this Official Statement. See "THE CERTIFICATES -- Book-Entry Only System" and "APPENDIX F -- Book-Entry Only System."

Prepayment. The Certificates are subject to optional prepayment and mandatory prepayment from net proceeds of insurance or condemnation. See "THE CERTIFICATES -- Prepayment."


MATUREY SCHEDULE

(See inside cover)

This cover page contains information for quick reference only. It is not a summary of all the provisions of the Certificates. Investors must read the entire official statement to obtain information essential in making an informed investment decision. See "RISK FACTORS" for a discussion of factors that should be considered, in addition to the other matters set forth in this Official Statement, in evaluating the investment quality of the Certificates.

The Certificates are offered when, as and if executed and delivered, subject to the approval as to their legality by Jones Hall, A Professional Law Corporation, San Francisco, California, Special Counsel. Certain legal matters will be passed upon for the City by Jones Hall, A Professional Law Corporation, San Francisco, California, as Disclosure Counsel, and for the Underwriter by Schiff Hardin LLP, San Francisco, California, as Underwriter's Counsel. It is anticipated that the Certificates will be available for delivery to DTC, on or about October __, 2016.

The date of this Official Statement is: September __, 2016

Preliminary; subject to change.
**MATURITY SCHEDULE**

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<th>Interest Rate</th>
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* Preliminary; subject to change.
† CUSIP® is a registered trademark of the American Bankers Association. CUSIP data is provided by CUSIP Global Services (CGS) which is managed on behalf of the American Bankers Association by S&P Capital IQ. CUSIP® data is not intended to create a database and does not serve in any way as a substitute for the CUSIP® Service Bureau. CUSIP® numbers are provided for convenience of reference only. Neither the City nor the Underwriter take any responsibility for the accuracy of such numbers.
GENERAL INFORMATION ABOUT THIS OFFICIAL STATEMENT

Use of Official Statement. This Official Statement is submitted in connection with the sale of the Certificates referred to herein and may not be reproduced or used, in whole or in part, for any other purpose. This Official Statement is not a contract between any Certificate owner and the City or the Underwriter.

No Offering Except by This Official Statement. No dealer, broker, salesperson or other person has been authorized by the City or the Underwriter to give any information or to make any representations other than those contained in this Official Statement and, if given or made, such other information or representation must not be relied upon as having been authorized by the City or the Underwriter.

No Unlawful Offers or Solicitations. This Official Statement does not constitute an offer to sell or the solicitation of an offer to buy nor may there be any sale of the Certificates by a person in any jurisdiction in which it is unlawful for such person to make such an offer, solicitation or sale.

Information in Official Statement. The information set forth in this Official Statement has been furnished by the City and other sources which are believed to be reliable, but it is not guaranteed as to accuracy or completeness.

Estimates and Forecasts. When used in this Official Statement and in any continuing disclosure by the City in any press release and in any oral statement made with the approval of an authorized officer of the City or any other entity described or referenced herein, the words or phrases “will likely result,” “are expected to”, “will continue”, “is anticipated”, “estimate”, “project,” “forecast”, “expect”, “intend” and similar expressions identify “forward looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. Such statements are subject to risks and uncertainties that could cause actual results to differ materially from those contemplated in such forward-looking statements. Any forecast is subject to such uncertainties. Inevitably, some assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between forecasts and actual results, and those differences may be material. The information and expressions of opinion herein are subject to change without notice, and neither the delivery of this Official Statement nor any sale made hereunder shall, under any circumstances, give rise to any implication that there has been no change in the affairs of the City or any other entity described or referenced herein since the date hereof.

Involvement of Underwriter. The Underwriter has provided the following statement for inclusion in this Official Statement: The Underwriter has reviewed the information in this Official Statement in accordance with, and as a part of, its responsibilities to investors under the federal securities laws as applied to the facts and circumstances of this transaction, but the Underwriter does not guarantee the accuracy or completeness of such information.

Stabilization of and Changes to Offering Prices. The Underwriter may overallot or take other steps that stabilize or maintain the market prices of the Certificates at levels above those that might otherwise prevail in the open market. If commenced, the Underwriter may discontinue such market stabilization at any time. The Underwriter may offer and sell the Certificates to certain securities dealers, dealer banks and banks acting as agent at prices lower than the public offering prices stated on the inside cover page of this Official Statement, and those public offering prices may be changed from time to time by the Underwriter.

Document Summaries. All summaries of the Trust Agreement, the Site Lease, the Lease Agreement, the Assignment Agreement, the Escrow Agreement or other documents referred to in this Official Statement are made subject to the provisions of such documents and qualified in their entirety to reference to such documents, and do not purport to be complete statements of any or all of such provisions.

No Securities Laws Registration. The Certificates have not been registered under the Securities Act of 1933, as amended, in reliance upon exceptions therein for the issuance and sale of municipal securities. The Certificates have not been registered or qualified under the securities laws of any state.

Effective Date. This Official Statement speaks only as of its date, and the information and expressions of opinion contained in this Official Statement are subject to change without notice. Neither the delivery of this Official Statement nor any sale of the Certificates will, under any circumstances, give rise to any implication that there has been no change in the affairs of the City, the Authority, the other parties described in this Official Statement, or the condition of the property within the City since the date of this Official Statement.

Website. The City maintains a website. However, the information presented on the website is not a part of this Official Statement and should not be relied upon in making an investment decision with respect to the Certificates.
CITY OF PACIFICA
SAN MATEO COUNTY
STATE OF CALIFORNIA

CITY COUNCIL MEMBERS

Sue Digre, Mayor
Mike O’Neil, Mayor Pro Tem
Karen Ervin, Councilmember
Mary Ann Nihart, Councilmember
John Keener, Councilmember

CITY STAFF

Lorie D. Tinflow, City Manager
Lorenzo Hines, Assistant City Manager
______________, Director of Finance
Kathy O’Connell, City Clerk

MUNICIPAL ADVISOR

Backstrom McCarley Berry & Co., LLC
San Francisco, California

SPECIAL COUNSEL and DISCLOSURE COUNSEL

Jones Hall, A Professional Law Corporation
San Francisco, California

UNDERWRITER’S COUNSEL

Schiff Hardin LLP
San Francisco, California

TRUSTEE and ESCROW BANK

U.S. Bank National Association
San Francisco, California
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APPENDIX A - SUMMARY OF CERTAIN PROVISIONS OF PRINCIPAL LEGAL DOCUMENTS
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OFFICIAL STATEMENT

2016 REFUNDING CERTIFICATES OF PARTICIPATION
Evidencing the Direct, Undivided Fractional Interests of the Owners Thereof in Lease Payments to be Made by the CITY OF PACIFICA to the City of Pacifica Financing Authority (2008 Certificates Refinancing)

INTRODUCTION

This Official Statement (which includes the cover page and Appendices hereto) (collectively, the “Official Statement”), provides certain information concerning the sale and delivery of the refunding certificates of participation captioned above (the “Certificates”), which evidence the direct, undivided fractional interests of the Owners thereof in lease payments (the “Lease Payments”) to be made by the City of Pacifica (the “City”) pursuant to a Lease Agreement dated as of October 1, 2016 (the “Lease Agreement”), between the City and City of Pacifica Financing Authority (the “Authority”).

All capitalized terms used in this Official Statement but not otherwise defined have the meanings set forth in the Trust Agreement (defined below) or the Lease Agreement. See “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF PRINCIPAL LEGAL DOCUMENTS.”

Use of Proceeds. The net proceeds of the sale of the Certificates will be used for the following purposes:

(i) to provide funds to refinance the City’s lease payment obligations in connection with outstanding Certificates of Participation (2008 Conversion of 2006 Auction Rate Certificates) (the “2008 Certificates”) which were executed and delivered on July 31, 2008 in the original aggregate principal amount of $19,815,000; and

(ii) to pay certain costs incurred in connection with the execution and delivery of the Certificates.

See “FINANCING PLAN.”

*Preliminary; subject to change.
Security and Sources of Payment. The Certificates evidence and represent the direct, undivided fractional interests of the registered owners (the “Owners”) thereof in the Lease Payments to be made by the City for the right to use certain real property and improvements (the “Leased Property”), to be leased by the City from the Authority under the Lease Agreement. See “THE LEASED PROPERTY” herein.

The City and the Authority will enter into a Site Lease dated as of October 1, 2016 (the “Site Lease”). Under the Site Lease, the City (as owner of the Leased Property) will lease the Leased Property to the Authority. Concurrently, the City and the Authority will enter into the Lease Agreement, under which the City will sublease the Leased Property back from the Authority.

The Certificates will be executed and delivered under a Trust Agreement dated as of October 1, 2016 (the “Trust Agreement”), among the City, the Authority and U.S. Bank National Association, San Francisco, California, as trustee (the “Trustee”).

The Trustee and the Authority will enter into an Assignment Agreement dated as of October 1, 2016 (the “Assignment Agreement”), under which the Authority will assign to the Trustee for the benefit of the Certificate Owners substantially all of the Authority’s right, title and interest in and to the Lease Agreement, including its right to receive the Lease Payments due under the Lease Agreement, provided that the Authority will retain the rights to indemnification and to payment or reimbursement of its reasonable costs and expenses under the Lease Agreement.

The Lease Payments and any Additional Payments (as defined in the Lease Agreement) are payable from any source of available funds of the City, and the City has covenanted to take such action as may be necessary to include all estimated Lease Payments and Additional Payments due under the Lease Agreement in each of its final approved budgets and to make all necessary appropriations therefrom.

See “SECURITY AND SOURCES OF PAYMENT FOR THE CERTIFICATES.”

LIMITED OBLIGATION. NEITHER THE CERTIFICATES NOR THE OBLIGATION OF THE CITY TO MAKE LEASE PAYMENTS CONSTITUTES AN INDEBTEDNESS OF THE CITY, THE AUTHORITY, THE STATE OF CALIFORNIA OR ANY POLITICAL SUBDIVISION THEREOF, WITHIN THE MEANING OF THE CONSTITUTION OF THE STATE OF CALIFORNIA OR OTHERWISE, OR AN OBLIGATION FOR WHICH THE CITY IS OBLIGATED TO LEVY OR PLEDGE ANY FORM OF TAXATION OR FOR WHICH THE CITY HAS LEVIED OR PLEDGED ANY FORM OF TAXATION.

Covenant to Appropriate; Abatement. The City is required under the Lease Agreement to take such action as may be necessary to include all Lease Payments coming due in each of its annual budgets during the term of the Lease Agreement and to make the necessary annual appropriations for all such Lease Payments. The semiannual Lease Payments payable under the Lease Agreement will comprise the interest and principal represented by the Certificates. See “SECURITY AND SOURCES OF PAYMENT FOR THE CERTIFICATES.”

However, the Lease Payments are subject to complete or partial abatement in the event and to the extent that there is substantial interference with the City’s right to use and possession of the Leased Property or any portion thereof. If the Lease Payments are abated under the
Lease Agreement, and are not paid from alternative sources as described in this Official Statement, the Certificate Owners would receive less than the full amount of principal and interest represented by the Certificates. To the extent proceeds of rental interruption insurance are available, the Lease Payments (or a portion thereof) may be made from those sources during periods of abatement. See “SECURITY AND SOURCES OF PAYMENT FOR THE CERTIFICATES – Abatement” and “RISK FACTORS.”

**Legal Matters.** The execution and delivery of the Certificates is subject to the approving opinion of Jones Hall, A Professional Law Corporation, San Francisco, California (“Special Counsel”), to be delivered in substantially the form attached hereto as Appendix D. Jones Hall, A Professional Law Corporation, San Francisco, California, is also serving as Disclosure Counsel to the City (“Disclosure Counsel”). Schiff Hardin LLP, San Francisco, California, is serving as counsel to the Underwriter (“Underwriter’s Counsel”). Payment of the fees of Special Counsel, Disclosure Counsel and Underwriter’s Counsel is contingent upon issuance of the Certificates.

**Tax Matters.** In the opinion of Special Counsel, subject, however to certain qualifications described in this Official Statement, under existing law, the portion of the Lease Payments designated as and comprising interest and received by the owners of the Certificates is excluded from gross income for federal income tax purposes and such interest is not an item of tax preference for purposes of the federal alternative minimum tax imposed on individuals and corporations, provided, however, that, for the purpose of computing the alternative minimum tax imposed on corporations (as defined for federal income tax purposes), such interest is taken into account in determining certain income and earnings. In the further opinion of Special Counsel, such interest is exempt from California personal income taxes. See “TAX MATTERS” and Appendix D hereto.

**Continuing Disclosure.** The City has covenanted and agreed that it will comply with and carry out all of the provisions of the Continuing Disclosure Certificate, dated the date of the Certificates and executed by the City (the “Continuing Disclosure Certificate”). The form of the Continuing Disclosure Certificate is included in Appendix E hereto. See “CONTINUING DISCLOSURE.”

**Summaries of Documents.** The summaries or references to the Site Lease, the Trust Agreement, the Lease Agreement, the Assignment Agreement, the Escrow Agreement and other documents, agreements and statutes referred to in this Official Statement, and the description of the Certificates included in this Official Statement, do not purport to be comprehensive or definitive, and such summaries, references and descriptions are qualified in their entireties by reference to each such document or statute.
FINANCING PLAN

Prepayment Plan

The City caused the execution and delivery of the 2008 Certificates, and in connection therewith entered into a Lease Agreement dated as of August 1, 2008, between the City and the Authority (the “2008 Lease Agreement”).

All of the outstanding 2008 Certificates will be refunded with Certificate proceeds (the “Refunded 2008 Certificates”) at a prepayment price equal to 102% of the par amount to be redeemed, plus accrued interest to the prepayment date, as identified in the following table. The 2008 Certificates are currently subject to prepayment on any date, and will be prepaid within 45 days following the execution and delivery of the Certificates.

CITY OF PACIFICA
Identification of Refunded 2008 Certificates

<table>
<thead>
<tr>
<th>Maturities to be Refunded (Jan. 1)</th>
<th>CUSIP†</th>
<th>Principal Amount Prepaid*</th>
<th>Prepayment Price (% of Par Amount Redeemed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>695096 DK0</td>
<td>$580,000</td>
<td>102.0%</td>
</tr>
<tr>
<td>2018</td>
<td>695096 DL8</td>
<td>555,000</td>
<td>102.0</td>
</tr>
<tr>
<td>2019</td>
<td>695096 DM6</td>
<td>625,000</td>
<td>102.0</td>
</tr>
<tr>
<td>2020</td>
<td>695096 DN4</td>
<td>625,000</td>
<td>102.0</td>
</tr>
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<td>2022†</td>
<td>695096 DQ7</td>
<td>1,275,000</td>
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<td>695096 DR5</td>
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<td>695096 DT1</td>
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<td>695096 DV6</td>
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<td>2029</td>
<td>695096 DX2</td>
<td>825,000</td>
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<td>2037†</td>
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<td>6,600,000</td>
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<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>$16,210,000</strong></td>
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</tr>
</tbody>
</table>

†: Term Certificates.

CUSIP® is a registered trademark of the American Bankers Association. CUSIP data is provided by CUSIP Global Services (CGS) which is managed on behalf of the American Bankers Association by S&P Capital IQ. CUSIP® data is not intended to create a database and does not serve in any way as a substitute for the CUSIP® Service Bureau. CUSIP® numbers are provided for convenience of reference only. Neither the City nor the Underwriter take any responsibility for the accuracy of such numbers.

Deposits in Escrow Fund

The City will deliver certain proceeds of the Certificates to U.S. Bank National Association, San Francisco, California, as escrow agent (the “Escrow Bank”), for deposit into an escrow fund (the "Escrow Fund") established under an Escrow Agreement (the “Escrow Agreement”), between the City and the Escrow Bank for the benefit of the holders of the Refunded 2008 Certificates. The Escrow Bank will hold all of the amounts deposited to the Escrow Fund in cash (uninvested), and use such amounts to pay the principal of and interest on
the Refunded 2008 Certificates, including the prepayment price of the Refunded 2008 Certificates, as set forth above, together with accrued interest to the prepayment dates identified above.

As a result of the deposit of funds with the Escrow Agent on the date of issuance of the Certificates, the Refunded 2008 Certificates will be legally defeased and will be payable solely from amounts held for that purpose under the Escrow Agreement, and will cease to be secured by the lease payments due under the 2008 Lease Agreement.

Amounts held by the Escrow Bank in the Escrow Fund are pledged solely to the payment of the Refunded 2008 Certificates, and will not be available for the payment of debt service with respect to the Certificates.

Sources and Uses of Funds

The estimated sources and uses of funds with respect to the Certificates are as follows:

<table>
<thead>
<tr>
<th>Sources of Funds</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal Amount of Certificates</td>
<td></td>
</tr>
<tr>
<td>Plus/Less Original Issue Premium/Discount</td>
<td></td>
</tr>
<tr>
<td>Total Sources</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Uses of Funds</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Escrow Fund (2008 Lease Prepayment)</td>
<td></td>
</tr>
<tr>
<td>Delivery Costs⁽¹⁾</td>
<td></td>
</tr>
<tr>
<td>Total Uses</td>
<td></td>
</tr>
</tbody>
</table>

⁽¹⁾ All estimated costs of issuance including, but not limited to, Underwriter’s discount, printing costs, and fees of Special Counsel, Disclosure Counsel, Municipal Advisor, Trustee, Escrow Agent, the rating agency and certain other costs.
THE LEASED PROPERTY

Description and Location

The Leased Property consists of the land and improvements which comprise the existing Public Safety Building and Fairmont West Park. Such property is described as follows:

Public Safety Building. The Public Safety Building, located at 2705 Coast Highway in the City, including the site and all related improvements, constitutes a portion of the Leased Property. The City owns fee title to the land on which the Public Safety Building is located, which consists of approximately 5.1 acres. The Public Safety Building consists of a single building of approximately 20,000 square feet, and includes a radio communications center, emergency operating center and public use room, facilities for processing and storage of evidence and property, prisoner processing and short-term holding facility, police records processing and storage facilities, police administrative offices, parking and vehicle fueling areas, and related facilities. Construction of the Public Safety Building was completed in October 2003 and the total cost of the construction project was approximately $10 million. Based on the purchase price of the land plus the 2003 insurance value of the improvements, as adjusted for inflation, the City estimates that the value of the Public Safety Building is approximately $12.4 million.

Fairmont West Park. Fairmont West Park, located at 5066 Palmetto Avenue in the City, including the land and all related improvements, constitutes a portion of the Leased Property. The City owns fee title to the land comprising the park, which consists of approximately 5.8 acres. There are no permanent structures currently on the land other than a restroom. Fairmont West Park is used for various community-related purposes. Based on surrounding land values and uses, the City estimates that the value of Fairmont West Park is approximately $17.4 million.

Fair Rental Value

The Lease Agreement provides that the Lease Payments payable in a Fiscal Year will constitute the total rental for the Leased Property for that Fiscal Year, and will be paid by the City in each Fiscal Year for and in consideration of the right of the use and occupancy of, and the continued quiet use and enjoyment of the Leased Property during each Fiscal Year.

The Authority and the City have agreed and determined in the Lease Agreement that the total Lease Payments represent the fair rental value of the Leased Property. In making such determination, consideration has been given to the estimated fair market value of the Leased Property, other obligations of the parties under the Lease, the uses and purposes which may be served by the Leased Property and the benefits therefrom which will accrue to the City and the general public.

Substitution

The Lease Agreement provides that, upon compliance with certain conditions specified therein, the City may substitute alternate real property for all or any portion of the Leased Property or to release a portion of the Leased Property from the Lease Agreement. See
"APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF PRINCIPAL LEGAL DOCUMENTS – The Lease Agreement."

THE AUTHORITY

The Authority was created on October 14, 1996, by the City and the Redevelopment Agency of the City of Pacifica under a Joint Exercise of Powers Agreement, to assist the City and the Redevelopment Agency in financing capital improvement projects. The members of the City Council serve as the governing board of the Authority. The Joint Exercise of Powers Agreement was entered into under the provisions of the Joint Powers Act. The Authority is a separate entity constituting a public instrumentality of the State of California with legal authority to facilitate the financing plan described herein.

THE CERTIFICATES

Certificate Terms

**General.** The Certificates evidence and represent direct, fractional undivided interests of the Owners thereof in the principal and interest components of Lease Payments to be made by the City pursuant to the Lease Agreement.

The Certificates are dated the date of original delivery thereof and will be executed and delivered, without coupons, in denominations of $5,000 or any integral multiple thereof, except that no Certificate shall represent principal payable in more than one year. The interest components evidenced by the Certificates will be due and payable semiannually on January 1 and July 1 of each year (each, a “Payment Date”), commencing January 1, 2017.

Each Certificate shall be dated as of the date of its execution, and interest represented thereby shall be payable from the Payment Date next preceding the date of execution thereof, (a) unless it is executed following the close of business on the fifteenth day of the month preceding each Payment Date, whether or not such fifteenth day is a Business Day (each, a “Record Date”) and on or before the next succeeding Payment Date, in which event interest represented thereby shall be payable from such Payment Date, or (b) unless it is executed on or before December 15, 2016, in which event interest represented thereby shall be payable from the day when the Certificates, duly executed by the Trustee, are delivered to the Underwriter; provided, however, that if, as of the date of any Certificate, interest represented by such Certificate is in default, interest represented thereby shall be payable from the Payment Date to which interest has previously been paid or made available for payment with respect to such Certificate. Interest shall be computed on the basis of a 360-day year comprised of twelve 30-day months.

The Lease Payments evidenced by the Certificates will be payable no later than the fifteenth day preceding each Payment Date (in the event that any payment due under the Lease Agreement is due on a day which is not a Business Day, such payment shall be made on the next Business Day), the principal components of which will evidence interest components calculated at the rates per annum, all as set forth on the front inside cover page of this Official Statement.
Prepayment*

The Certificates are subject to prepayment as described below. Capitalized terms used below and not defined have the meanings assigned to such terms in the Trust Agreement. See “APPENDIX A - SUMMARY OF CERTAIN PROVISIONS OF PRINCIPAL LEGAL DOCUMENTS.”

Optional Prepayment. The Certificates maturing on or before January 1, 20__, are not subject to optional prepayment before their respective stated maturities. The Certificates maturing on or after January 1, 20__, are subject to prepayment prior to their respective stated maturities, at the option of the City, in whole, or in part among maturities on such basis as designated by the City and by lot within any one maturity on January 1, 20__, or on any date thereafter, upon payment of a prepayment price equal to 100% of the principal amount to be prepaid, together with accrued interest to the date fixed for prepayment, without premium.

Mandatory Prepayment from Net Proceeds. The Certificates are subject to mandatory prepayment, in whole or in part, on any Business Day (as defined in the Trust Agreement), among maturities on a pro rata basis and by lot within a maturity, from the Net Proceeds (as defined in the Trust Agreement) of insurance or eminent domain proceedings credited towards the prepayment of the Lease Payments under the Lease Agreement and Trust Agreement, at a prepayment price equal to 100% of the principal amount to be prepaid, together with accrued interest represented thereby to the date fixed for prepayment, without premium. See “APPENDIX A - SUMMARY OF PRINCIPAL LEGAL DOCUMENTS.”

Purchase In Lieu of Prepayment. In lieu of prepayment of Certificates as provided in the Trust Agreement and described above, amounts held by the Trustee for such prepayment may, at the written request of the City, be applied by the Trustee to the purchase of Certificates at public or private sale as and when and at such prices (including brokerage, accrued interest and other charges) as the City may in its discretion direct, but not to exceed the prepayment price which would be payable if such Certificates were prepaid.

Notice of Prepayment. The Trustee shall give notice of the prepayment of the Certificates on behalf and at the expense of the City by first class mail with postage prepaid, to the Securities Depositories and to the Owners of Certificates designated for prepayment at their respective addresses appearing on the Registration Books, at least 30 days but not more than 60 days prior to the prepayment date. Such notice must:

(a) state the prepayment date and prepayment price;

(b) state the numbers or maturities of the Certificates to be prepaid, if less than all of the then Outstanding Certificates are to be called for prepayment;

(c) if a Certificate is to be prepaid only in part, identify the portion of the Certificate which is to be prepaid;

(d) require that such Certificates be surrendered on the prepayment date at the Office of the Trustee for prepayment at said prepayment price;

* Preliminary; subject to change.
(e) state that interest represented by the Certificates will not accrue after the prepayment date; and

(f) state that on the prepayment date the principal and premium, if any, represented by each Certificate will become due and payable, together with accrued interest represented thereby to the prepayment date, and that from and after such date interest represented thereby ceases to accrue and be payable.

Neither the failure to receive any such notice nor any defect in any notice so mailed shall affect the sufficiency of the proceedings for the prepayment of such Certificates or the cessation of accrual of interest represented thereby from and after the date fixed for prepayment.

While the Certificates are subject to the book-entry system, the Trustee will not be required to give any notice of prepayment to any person or entity other than DTC and to the Municipal Securities Rulemaking Board through its Electronic Municipal Market Access System and at the City’s written direction, other securities depositories and information services. DTC and the DTC Participants shall have sole responsibility for providing any such notice of prepayment to the Beneficial Owners of the Certificates to be prepaid. Any failure at DTC to notify any DTC Participant, or any failure of a DTC Participant to notify the Beneficial Owner of any Certificates to be prepaid, of a notice of prepayment or its content or effect will not affect the validity of the notice of prepayment, or alter the effect of prepayment described below under “Effect of Prepayment.”

Selection of Certificates. Whenever provision is made in the Trust Agreement for the prepayment of Certificates and less than all Outstanding Certificates of any maturity are called for prepayment, the Trustee shall select Certificates of such maturity for prepayment by lot. For the purposes of such selection, Certificates shall be deemed to be composed of $5,000 portions, and any such portion may be separately prepaid.

Effect of Prepayment. Moneys for the prepayment (including the interest to the applicable date of prepayment) of Certificates having been set aside in the Lease Payment Fund, the Certificates shall become due and payable on the date of such prepayment, and, upon presentation and surrender thereof at the Office of the Trustee, said Certificates shall be paid at the unpaid principal amount (or applicable portion thereof) represented thereby plus interest accrued and unpaid to said date of prepayment.

If, on said date of prepayment, moneys for the prepayment of all the Certificates to be prepaid, together with interest represented thereby to said date of prepayment, shall be held by the Trustee so as to be available therefor on such date of prepayment, then, from and after said date of prepayment, interest represented by the Certificates shall cease to accrue and become payable. All moneys held by the Trustee for the prepayment of Certificates shall be held in trust for the account of the Owners of the Certificates so to be prepaid, and shall be held by the Trustee in cash uninvested.

Book-Entry Only System

The Certificates will be executed and delivered as fully registered certificates, registered in the name of Cede & Co. as nominee of DTC, and will be available to actual purchasers of the Certificates (the “Beneficial Owners”) in the denominations set forth above, under the book-entry system maintained by DTC, only through brokers and dealers who are or act through DTC Participants (as defined in this Official Statement) as described herein. Beneficial Owners will
not be entitled to receive physical delivery of the Certificates. See “APPENDIX F – Book-Entry Only System.” If the book-entry-only system is no longer used with respect to the Certificates, the Certificates will be registered and transferred in accordance with the Trust Agreement, as described below.

Transfer and Exchange of Certificates

While the Certificates are subject to DTC’s book-entry system, their exchange and transfer will be effected through DTC and the Participants and will be subject to the procedures, rules and requirements established by DTC. See “APPENDIX F – Book-Entry Only System.” During any period in which the Certificates are not subject to DTC’s book-entry system, their exchange and transfer will be governed by provisions of the Trust Agreement summarized in “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF PRINCIPAL LEGAL DOCUMENTS.”
LEASE PAYMENT SCHEDULE

Following is the schedule of Interest Payment Dates with respect to the Certificates. Under the Lease Agreement, Lease Payments are due the 15th calendar day of the month immediately preceding each Interest Payment Date.

<table>
<thead>
<tr>
<th>Date*</th>
<th>Principal Component</th>
<th>Interest Component</th>
<th>Total Payments</th>
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<td>January 1, 2017</td>
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<tr>
<td>Totals</td>
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</tr>
</tbody>
</table>

*Preliminary; subject to change.
SECURITY AND SOURCES OF PAYMENT FOR THE CERTIFICATES

Nature of the Certificates

**General.** Each Certificate evidences and represents a direct, undivided fractional interest in the principal component of the Lease Payment due under the Lease Agreement on the payment date or prepayment date of such Certificate, and the interest component of all Lease Payments (based on the stated interest rate with respect to such Certificate) to accrue from the date of delivery to its principal payment date or prepayment date, as the case may be.

**Assignment of Rights in Lease to Trustee.** The Authority, under the Assignment Agreement, will assign to the Trustee for the benefit of the Certificate Owners substantially all of the Authority’s right, title and interest in and to the Lease Agreement, including, without limitation, its right to receive Lease Payments to be paid by the City; except that the Authority will retain certain rights under the Lease Agreement (including the rights to Additional Payments (defined below), repayment of advances, indemnification and payment of attorneys’ fees). The City will pay Lease Payments directly to the Trustee, as assignee of the Authority. See “– Lease Payments” below.

Lease Payments

**General.** For the right to the use and occupancy of the Leased Property, the Lease Agreement requires the City to make Lease Payments. To secure the payment of the Lease Payments, the City is required to pay to the Trustee, for deposit into the Lease Payment Fund established and maintained by the Trustee, on the fifteenth day before each Payment Date, an amount sufficient to pay the Lease Payment then due.

Pursuant to the Trust Agreement, the Trustee shall withdraw moneys from the Lease Payment Fund on each Interest Payment Date in amounts which equal the Lease Payment due on such Interest Payment Date and shall cause all sums withdrawn from the Lease Payment Fund to be applied to the payment of principal and interest evidenced by the Certificates due on such Interest Payment Date.

Scheduled Lease Payments relating to the Certificates are set forth above under the heading “LEASE PAYMENT SCHEDULE.”

**Additional Payments.** In addition to the Lease Payments, the City shall pay when due, as additional rental for the Leased Property under the Lease Agreement (“Additional Payments”), all costs and expenses incurred by the City under the Lease Agreement or under the Trust Agreement, or incurred by the Authority to comply with the provisions of the Trust Agreement, including without limitation all costs of issuance of the Certificates (to the extent not paid from amounts on deposit in the Costs of Issuance Fund), annual compensation due to the Trustee and all of its reasonable costs and expenses (including amounts payable to the Trustee by virtue of indemnification) payable as a result of the performance of and compliance with its duties under the Trust Agreement, and all reasonable costs and expenses of attorneys, auditors, engineers and accountants engaged by the Authority or the Trustee in connection with the Leased Property or the performance of their duties under the Lease Agreement or under the Trust Agreement.

**Covenant to Appropriate Funds.** In the Lease Agreement, the City covenants to take such action as may be necessary to include all estimated Lease Payments and all estimated
Additional Payments in each of its final approved budgets. The City further covenants to make all necessary appropriations (including any supplemental appropriations) from any source of legally available funds of the City for all the actual amount of Lease Payments and Additional Payments which come due and payable during the period covered by each such budget. The covenants on the part of the City contained in the Lease Agreement shall be duties imposed by law and shall be the duty of each and every public official of the City to take such action and do such things as are required by law in the performance of the official duty of such officials to enable the City to carry out and perform the covenants and agreements in in the Lease Agreement agreed to be carried out and performed by the City.

See “APPENDIX A - SUMMARY OF CERTAIN PROVISIONS OF LEGAL DOCUMENTS - The Lease Agreement - Lease Payments.”

Abatement

The Lease Payments are paid by the City in each rental period for the City’s right to use and occupy the Leased Property for such rental period. If the Leased Property is taken permanently under the power of eminent domain or sold to a government threatening to exercise the power of eminent domain, the term of the Lease Agreement will cease as of the day possession is so taken. If less than all of the Leased Property is taken permanently, or if the Leased Property is taken temporarily, under the power of eminent domain, (a) the Lease Agreement will continue in full force and effect with respect thereto and will not be terminated by virtue of such taking and the parties waive the benefit of any law to the contrary, and (b) there will be a partial abatement of Lease Payments allocated thereto, in an amount to be determined by the City such that the resulting Lease Payments represent fair consideration for the use and occupancy of the remaining usable portions of the Leased Property. However, there will be no abatement of Lease Payments to the extent that insurance proceeds are available to pay Lease Payments that would otherwise be abated under this provision, and such proceeds and amounts will constitute a special fund for the payment of the Lease Payments.

Such abatement or adjustment, if any, will continue for the period commencing with such damage or destruction or taking and ending with the substantial completion of the work of repair or reconstruction; and the term of the Lease Agreement shall be extended as provided in the Lease Agreement, except that the term of the Lease Agreement will in no event be extended more than ten years beyond the termination date. Abatement of the Lease Payments is not an event of default under the Lease Agreement and does not permit the Trustee to take any action or avail itself of any remedy against the City. In the event of any such partial damage or destruction or taking, the Lease Agreement will continue in full force and effect and the City waives any right to terminate the Lease Agreement by virtue of any such damage or destruction or taking. For information regarding rental interruption insurance, see “– Covenant to Maintain Property Insurance” below.

The Trustee cannot terminate the Lease Agreement solely on the basis of such substantial interference. For a description of abatement resulting from condemnation of all or part of the Leased Property, see “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF PRINCIPAL LEGAL DOCUMENTS – The Lease Agreement – Lease Payments – Abatement of Rent.”
Limited Obligation

THE OBLIGATION OF THE CITY TO MAKE THE LEASE PAYMENTS DOES NOT CONSTITUTE A DEBT OF THE CITY, THE AUTHORITY OR THE STATE OR OF ANY POLITICAL SUBDIVISION THEREOF WITHIN THE MEANING OF ANY CONSTITUTIONAL OR STATUTORY DEBT LIMIT OR RESTRICTION, AND DOES NOT CONSTITUTE AN OBLIGATION FOR WHICH THE CITY, THE COUNTY OR THE STATE IS OBLIGATED TO LEVY OR PLEDGE ANY FORM OF TAXATION OR FOR WHICH THE CITY, THE COUNTY OR THE STATE HAS LEVIED OR PLEDGED ANY FORM OF TAXATION.

Termination or Abatement Due to Eminent Domain. Under the Lease Agreement, if the Leased Property is taken permanently under the power of eminent domain or sold to a government threatening to exercise the power of eminent domain, the Term of the Lease Agreement will cease with respect thereto as of the day possession is so taken.

If less than all of the Leased Property is taken permanently, or if the Leased Property is taken temporarily, under the power of eminent domain, (a) the Lease Agreement will continue in full force and effect with respect thereto and will not be terminated by virtue of such taking, and the parties waive the benefit of any law to the contrary, and (b) there will be a partial abatement of Lease Payments allocated thereto, in an amount to be agreed upon by the City and the Authority such that the resulting Lease Payments represent fair consideration for the use and occupancy of the remaining usable portions of the Leased Property, calculated in accordance with the Lease Agreement.

However, there will be no abatement of Lease Payments to the extent that eminent domain proceeds are available to pay Lease Payments that would otherwise be abated under this provision, and such proceeds and amounts will constitute a special fund for the payment of the Lease Payments.

Lease Payment Fund

Establishment. Under the Trust Agreement the Trustee will establish a special fund designated as the "Lease Payment Fund." All moneys at any time deposited by the Trustee in the Lease Payment Fund will be held by the Trustee in trust for the benefit of the City and the Owners of the Certificates.

So long as any Certificates are Outstanding, neither the City nor the Authority will have any beneficial right or interest in the Lease Payment Fund or the moneys deposited therein, except only as provided in the Trust Agreement, and such moneys will be used and applied by the Trustee as set forth in the Trust Agreement.

Deposits. All Lease Payments received by the Trustee will be deposited in the Lease Payment Fund.

Application of Moneys. All amounts in the Lease Payment Fund will be used and withdrawn by the Trustee solely for the purpose of paying the principal, interest and prepayment premiums (if any) represented by the Certificates as they become due and payable, in accordance with the Trust Agreement.

Lease Payment Fund; Surplus. Any surplus remaining in the Lease Payment Fund after prepayment and payment of all Certificates, including premiums and accrued interest (if
any) and payment of any applicable fees and expenses to the Trustee, or provision for such prepayment or payment having been made to the satisfaction of the Trustee, will be withdrawn by the Trustee and remitted to the City.

**Action on Default**

If the City defaults under the Lease Agreement, the Trustee, as assignee of the Authority’s rights under the Lease Agreement, may terminate the Lease Agreement and recover certain damages from the City, or may retain the Lease Agreement and hold the City liable for all Lease Payments thereunder on an annual basis. Lease Payments may not be accelerated upon a default under the Lease Agreement. See “RISK FACTORS.”

For a description of the events of default and permitted remedies of the Trustee (as assignee of the Authority) contained in the Lease Agreement and the Trust Agreement, see “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF PRINCIPAL LEGAL DOCUMENTS.”

**No Reserve Fund**

No reserve fund will be established for the Certificates.

**Covenant to Maintain Insurance**

The Lease Agreement requires the City to obtain public liability and property damage insurance, casualty insurance, rental interruption insurance, and to obtain a title insurance policy with respect to the Leased Property, as described below.

**Public Liability and Property Damage Insurance.** The City will maintain or cause to be maintained, throughout the term of the Lease Agreement, comprehensive general insurance in protection of the Authority, the City and their respective members, officers, agents, employees and assigns. Such insurance shall provide for indemnification of said parties against direct or contingent loss or liability for damages for bodily and personal injury, death or property damage occasioned by reason of the operation of the Leased Property. Such insurance shall provide coverage in such liability limits and be subject to such deductibles as the City deems adequate and prudent. Such insurance may be maintained as part of or in conjunction with any other insurance coverage carried by the City, and may be maintained in whole or in part in the form of a program of self-insurance by the City, or in the form of the participation by the City in a joint powers authority or other program providing pooled insurance. The City shall apply the proceeds of such insurance toward extinguishment or satisfaction of the liability with respect to which the net proceeds are paid.

**Casualty Insurance.** The City will procure and maintain, or cause to be procured and maintained, at all times throughout the term of the Lease Agreement, casualty insurance against loss or damage to the insured buildings, facilities and other improvements constituting any part of the Leased Property, in an amount at least equal to the lesser of (a) the replacement value of such buildings, facilities and improvements, or (b) the aggregate principal amount of the Outstanding Certificates. Such insurance shall, as nearly as practicable, cover loss or damage by fire, explosion, windstorm, riot, aircraft, vehicle damage, smoke and such other hazards as are normally covered by such insurance, and shall include earthquake coverage if such coverage is available at reasonable cost from reputable insurers in the reasonable determination of the City, whose determination is final and conclusive. Such insurance may be
subject to such deductibles as the City deems prudent. Such insurance may be maintained as part of or in conjunction with any other insurance coverage carried by the City, and may be maintained in whole or in part in the form of the participation by the City in a joint powers authority or other program providing pooled insurance; provided that such insurance may not be maintained by the City in the form of self-insurance. The City shall apply the Net Proceeds of such insurance as provided in the Lease Agreement.

**Rental Interruption Insurance.** The City will procure and maintain, or cause to be procured and maintained, at all times throughout the term of the Lease Agreement, rental interruption or use and occupancy insurance to cover loss, total or partial, of the use of the buildings, facilities and other improvements constituting any part of the Leased Property, as a result of any of the hazards covered in due to a casualty as described in the preceding paragraphs, in an amount at least equal to the maximum Lease Payments coming due and payable during any two consecutive Fiscal Years during the remaining Term of the Lease Agreement. Such insurance may be maintained as part of or in conjunction with any other insurance coverage carried by the City, and may be maintained in whole or in part in the form of the participation by the City in a joint powers authority or other program providing pooled insurance; provided that such insurance may not be maintained by the City in the form of self-insurance. The Net Proceeds of such insurance, if any, shall be paid to the Trustee and deposited in the Lease Payment Fund, and shall be credited towards the payment of the Lease Payments allocable to the insured improvements as the same become due and payable.

**Title Insurance.** The City shall obtain a CLTA title insurance policy insuring the City’s leasehold estate in the Leased Property under the Lease, in an amount at least equal to the aggregate principal amount of the Certificates. All Net Proceeds received under such title insurance policy will be deposited with the Trustee in the Lease Payment Fund and credited towards the prepayment of the Lease Payments under the Lease Agreement.

See also “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF PRINCIPAL LEGAL DOCUMENTS – The Lease Agreement – Insurance.”

**Insurance and Condemnation Fund; Application of Net Proceeds**

The Lease Agreement requires that Net Proceeds of any insurance or condemnation award with respect to the Leased Property (other than proceeds of rental interruption insurance, which are required to be deposited into the Lease Payment Fund) be paid to the Trustee to be applied as provided in the Trust Agreement. The Trust Agreement provides that such Net Proceeds received by the Trustee shall be deposited in the Insurance and Condemnation Fund and that the City shall, within 90 days of the deposit of Net Proceeds with the Trustee, file a certificate with the Trustee and the Net Proceeds shall be applied by the Trustee as follows:
Application of Net Proceeds of Insurance. Any Net Proceeds of insurance collected by the City in the event of accident to or destruction of any component of the Leased Property shall be paid to the Trustee under the Lease Agreement and deposited by the Trustee promptly upon receipt thereof in a special fund designated as the “Insurance and Condemnation Fund” which the Trustee shall establish. If the City determines and notifies the Trustee in writing of its determination, within 90 days following the date of such deposit, that the replacement, repair, restoration, modification or improvement of the Leased Property is not economically feasible or in the best interests of the City, then such Net Proceeds shall be promptly transferred by the Trustee to the Lease Payment Fund and applied to the prepayment of Lease Payments and the corresponding mandatory prepayment of Certificates, which prepayment shall be made on the first Interest Payment Date for which notice of prepayment can be timely given. The determination of the City to apply Net Proceeds to the prepayment of Certificates is subject to the following:

(a) if the Leased Property is damaged or destroyed in full, such Net Proceeds may be transferred to the Lease Payment Fund to be used to prepay Outstanding Certificates only if such Net Proceeds, together with other available moneys, are sufficient to cause the corresponding prepayment of all Lease Payments allocable to the Leased Property; and

(b) if the Leased Property is damaged or destroyed in part but not in whole, such Net Proceeds may be transferred to the Lease Payment Fund to be used to prepay Outstanding Certificates only if the Lease Payments which result after the corresponding abatement thereof under the Lease Agreement are sufficient to pay the full amount of principal and interest represented by the Certificates which remain Outstanding after such prepayment.

All Net Proceeds deposited in the Insurance and Condemnation Fund and not so transferred to the Lease Payment Fund shall be applied to the prompt replacement, repair, restoration, modification or improvement of the damaged or destroyed portions of the Leased Property by the City, upon receipt of written requisitions of the City stating with respect to each payment to be made (a) the name and address of the person, firm or corporation to whom payment is due, (b) the amount to be paid and (c) that each obligation mentioned therein has been properly incurred, is a proper charge against the Insurance and Condemnation Fund, has not been the basis of any previous withdrawal, and specifying in reasonable detail the nature of the obligation. Any balance of the Net Proceeds remaining after the City shall file a written certificate with the Trustee stating that such work has been completed shall, after payment of all amounts then due and owing to the Trustee hereunder, be paid to the City.

See “THE CERTIFICATES – Prepayment – Mandatory Prepayment from Net Proceeds.”

Application of Net Proceeds of Condemnation Award. The Trust Agreement provides that, if all or any part of the Leased Property is taken by eminent domain proceedings (or sold to a government threatening to exercise the power of eminent domain) the Net Proceeds therefrom shall be deposited with the Trustee in the Insurance and Condemnation Fund, under the Lease Agreement, and shall be applied and disbursed by the Trustee as follows:

(a) If the City gives written notice to the Trustee of its determination that (i) such eminent domain proceedings have not materially affected the
interest of the City in the Leased Property or the ability of the City to meet any of its financial obligations under the Lease Agreement, and (ii) that such proceeds are not needed for repair, replacement or rehabilitation of the Leased Property, and the City has given written notice to the Trustee of such determination, the Trustee shall transfer such proceeds to the Lease Payment Fund to be credited towards the payment of the Lease Payments as they become due and payable.

(b) If the City gives written notice to the Trustee of its determination that (i) such eminent domain proceedings have not materially affected the interest of the City in the Leased Property or the ability of the City to meet any of its financial obligations under the Lease Agreement, and (ii) such proceeds are needed for repair, replacement or rehabilitation of the Leased Property, the Trustee shall pay to the City, or to its order, from said proceeds such amounts as the City may expend for the repair or rehabilitation of the Leased Property.

(c) If (i) less than all of the Leased Property is taken in such eminent domain proceedings or sold to a government threatening the use of eminent domain powers, and if the City gives written notice to the Trustee of its determination that such eminent domain proceedings have materially affected the interest of the City in the Leased Property or the ability of the City to meet any of its financial obligations under the Lease Agreement, or (ii) all of the Leased Property is taken in such eminent domain proceedings, then the Trustee shall transfer such proceeds to the Lease Payment Fund to be credited toward the prepayment of the Lease Payments of the Lease Agreement and applied to the corresponding mandatory prepayment of Certificates, which prepayment shall be made on the first prepayment date for which notice of prepayment can be timely given.

In making any such determination whether to repair, replace or rehabilitate the Leased Property under this Section, the City may obtain, but is not required to obtain, at its expense, the report of an independent engineer or other independent professional consultant, a copy of which must be filed with the Trustee. Any such determination by the City is final. See also “THE CERTIFICATES – Prepayment – Mandatory Prepayment from Net Proceeds.”
CITY FINANCIAL INFORMATION

General

The City is located on the Pacific Coast directly south of San Francisco on the Bay Area peninsula in San Mateo County. The City encompasses approximately 12.6 square miles, with a population estimated to be 38,551 as of January 1, 2015. The City was incorporated on November 22, 1957 under the general laws of the State and has a council-manager form of government. There are five Council Members who serve overlapping terms of four years, and the Council, in turn, selects one of the Council Members to serve as Mayor for one year. The legislative body selects a City Manager to administer the affairs of the City, a City Attorney, and members of advisory commissions and committees.

The City provides public safety (police, fire and civil defense), highways and street, sanitation, health and social services, culture/recreation, public improvements, planning and zoning and general administrative services. Water, garbage, gas and electric utilities are provided directly through private agencies not under City operations. See “APPENDIX B - GENERAL INFORMATION ABOUT THE CITY OF PACIFICA AND SAN MATEO COUNTY.”

City Budgets

Annual Budget Process. The City annually adopts a budget to be effective July 1 for the ensuing fiscal year. The City Manager submits a Preliminary Budget to the City Council on or about May 15 each year. This Preliminary Budget is the fiscal plan for the ensuing twelve months starting July 1 and includes proposals for expenditures for operations and capital improvement, and the resources to meet them. City Council conducts public hearings at Council Chambers before adopting the budget. The Council approves total appropriations at the department level in the General Fund, and at the fund level in other funds. The Budget is adopted by City resolution prior to June 30.

The appropriated budget is prepared by fund, function, and department. The City Manager is authorized to transfer budget appropriations within departments in conformance with the adopted policies set by the City Council. All other transfers must be approved by the City Council. Any revisions that alter the total expenditures of any department must be approved by the City Council. Expenditures a re-budgeted at, and may not legally exceed, the department level for the General Fund and the fund level for Special Revenue, Debt Service, Capital Projects and Internal Service Funds. Budgeted amounts shown are as originally adopted, or as amended by the City Council during the fiscal year. During fiscal year 2014-15, several supplementary appropriations were necessary.

Budgets for General, Special Revenue, Debt Service, Capital Projects, and Internal Service Funds a re-adopted on a basis consistent with accounting principles generally accepted in the United States of America (“GAAP”). Except for Capital Project Funds, appropriations lapse at fiscal year-end and are re-budgeted for the coming year. Capital Projects are budgeted for on a project basis rather than an annual basis; unexpended project authority is carried forward until the project is completed.

Encumbrances represent commitments related to unperformed contracts for goods or services. Encumbrance accounting, under which purchase orders, contracts, and other commitments for the expenditure of monies a re recorded in order to reserve that portion of the applicable appropriation, is employed as an extension of formal budgetary integration in the
governmental funds. Encumbrances outstanding at fiscal year-end are recorded as restricted, committed, or assigned fund balances and do not constitute expenditures or liabilities because the commitments will be honored during the subsequent fiscal year.

**Adopted Fiscal Year 2015-16 Budget.** The fiscal year 2015-16 Budget anticipates $37.2 million in revenue, a 6.7% increase over the 2014-15 Budget. There are notable increases in some revenue sources. The largest percentage increase is in the tax category, due to an assumed increase of 4% on the secured property taxes, an estimated increase of 3.5% in sales tax, and one-time sales tax revenue of $754,000. All are at the highest revenue level to date.

The General Fund operating expenditure plan presented in the fiscal year 2015-16 Budget is $37.4 million and represents a 3.1% increase over the 2014-15 Budget. Personnel costs are 3.3% higher than the 2014-15 Budget due to elimination of furlough programs and estimated increases in employee benefit and retirement costs.

**City’s Historical General Fund Budgeted and Actual Figures.** The table below compares the City’s General Fund Adopted Budget revenues and expenditures with its actual results (audited). The City has consistently followed conservative budgeting practices, with actual revenues consistently more than budgeted amounts, and budgeted expenditures consistently less than budgeted. The City’s Comprehensive Annual Report for Fiscal Year 2014-15 is attached hereto as Appendix C.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>CITY OF PACIFICA</th>
<th>General Fund Budgeted and Actual Revenues and Expenses</th>
<th>Fiscal Years 2012-13 through 2014-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>Fiscal Year</td>
<td>Fiscal Year</td>
<td>Fiscal Year</td>
</tr>
<tr>
<td></td>
<td>2012-13</td>
<td>2013-14</td>
<td>2014-15</td>
</tr>
<tr>
<td>Budgeted</td>
<td>$26,249,332</td>
<td>$27,134,515</td>
<td>$26,197,314</td>
</tr>
<tr>
<td>Actual</td>
<td>26,195,509</td>
<td>28,234,513</td>
<td>28,414,020</td>
</tr>
<tr>
<td>Difference - Actual vs. Budgeted</td>
<td>(53,823)</td>
<td>1,099,998</td>
<td>2,216,706</td>
</tr>
<tr>
<td>% Difference</td>
<td>(0.21%)</td>
<td>4.05%</td>
<td>8.46%</td>
</tr>
</tbody>
</table>

| Expenditures| Fiscal Year     | Fiscal Year        | Fiscal Year        |
|            | 2012-13         | 2013-14           | 2014-15            |
| Budgeted   | $22,889,523     | $23,523,214       | $25,625,000        |
| Actual     | 22,880,497      | 23,757,437        | 25,353,522         |
| Difference - Actual vs. Budgeted | (9,026) | 234,223 | (271,478) |
| % Difference | (0.04%) | 1.00% | (1.06%) |

Net Surplus or Deficit as Compared to Budget
(61,712) $865,775 $1,836,348

Source: City of Pacifica and City of Pacifica Audited Financial Statements.

**City’s Financial Policies**

**Long Term Financial Plan.** The City Council updated its long term financial plan in March 2016 to assist in the preparation of the 2016-17 general fund budget. The forecast models use optimistic, moderate and pessimistic scenarios, with assumptions based on, among other things, expected consumer price index, County property tax revenue estimates and the expected impact of recent labor agreements. The pessimistic scenario shows the City’s general

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fund balance ending with a surplus on June 30, 2017, with deficits in following years. The optimistic scenario shows continuing general fund surpluses through fiscal year 2020-21.

**Reserve Policy.** The City has a reserve policy, updated as of June 2013, regarding the procedures for establishing and reporting fund balances in the General Fund in accordance with GASB Statement No. 54. Under this reserve policy, the City works to fund a reserve at 10% of General Fund expenditures. Two-thirds of those reserves will be unreserved and undesignated. The remaining one-third will be for economic contingencies. Unreserved, undesignated reserves are General Fund balances that accumulate over time as a result of revenues in excess of expenditures, and not set aside for any particular purpose. The economic contingency reserve provides for unexpected interruptions in cash inflows to the City. Under the reserve policy, a majority vote of the City Council is required for any appropriation and expenditure of funds from the reserves noted above.

**Investment Policy**

Under Section 53600 et seq. of the California Government Code, the City is required to present an annual investment policy (the "Investment Policy") for confirmation by the City Council. The Investment Policy is intended to provide guidelines for the prudent investment of City funds and to outline the policies for maximizing the efficiency of the City's cash management. A full copy of the current Investment Policy is attached as APPENDIX G.

**Financial Statements**

**Accounting Policies.** The basic financial statements of the City are prepared in conformity with GAAP as applied to governmental agencies. The Governmental Accounting Standards Board ("GASB") is the accepted standard setting body for establishing governmental accounting and financial reporting principles.

The accounts of the City are organized on the basis of funds, each of which is considered a separate accounting entity. The operations of each fund are accounted for by providing a separate set of self-balancing accounts that comprise its assets, liabilities, fund equity, revenues and expenditures or expenses, as appropriate. City resources are allocated to and accounted for in individual funds based upon the purposes for which they are to be spent and the means by which spending activities are controlled.

See “APPENDIX C – COMPREHENSIVE ANNUAL REPORT OF THE CITY FOR THE FISCAL YEAR ENDED JUNE 30, 2015- Note 1” for a full presentation of the City’s accounting policies.

**Management’s Discussion and Analysis.** One key change resulting from the adoption of GASB Statement No. 34 is the inclusion of management’s discussion and analysis as required supplementary information. See “APPENDIX C – COMPREHENSIVE ANNUAL REPORT OF THE CITY FOR THE FISCAL YEAR ENDED JUNE 30, 2015” for a full presentation of management’s discussion and analysis for the most recent fiscal year.

**Audited Financial Statements.** The City’s most recent audited financial statements for the Fiscal Year ending June 30, 2015, are attached as “APPENDIX C – COMPREHENSIVE ANNUAL REPORT OF THE CITY FOR THE FISCAL YEAR ENDED JUNE 30, 2015” to this Official Statement, which were prepared by the City and audited by Maze & Associates, Certified Public Accountants, Pleasant Hill, California (the “Auditor”).
The Financial Statements should be read in their entirety. The City has not requested nor did the City obtain permission from the Auditor to include the audited financial statements as an appendix to this Official Statement. Accordingly, the Auditor has not performed any post-audit review of the financial condition or operations of the City or the General Fund. In addition, the Auditor has not reviewed this Official Statement. General Fund Financial Data

The following tables provide a recent history of the City’s Comparative Balance Sheet, and summarize General Fund revenues, expenditures, transfers, and ending fund balances for the City for Fiscal Years 2010-11 through 2014-15. Although the City’s fiscal year 2015-16 audited financial statements are not yet available, the City’s Mid-Year Budget Report dated March 14, 2016 reflects a General Fund net surplus of $486,000.
### TABLE 2
CITY OF PACIFICA
General Fund Balance Sheet
Fiscal Years Ending June 30, 2011 through June 30, 2015 (Audited)

<table>
<thead>
<tr>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash and investments(^{(1)})</td>
<td>$193,782</td>
<td>$241,760</td>
<td>$181,970</td>
<td>$1,414,405</td>
</tr>
<tr>
<td>Receivables:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taxes</td>
<td>793,838</td>
<td>753,747</td>
<td>784,031</td>
<td>950,531</td>
</tr>
<tr>
<td>Accounts</td>
<td>259,063</td>
<td>335,142</td>
<td>454,812</td>
<td>364,790</td>
</tr>
<tr>
<td>Interest</td>
<td>17,682</td>
<td>13,049</td>
<td>10,221</td>
<td>9,657</td>
</tr>
<tr>
<td>Grants</td>
<td>337,105</td>
<td>292,348</td>
<td>146,668</td>
<td>120,692</td>
</tr>
<tr>
<td>Due from other funds</td>
<td>1,420,195</td>
<td>1,063,297</td>
<td>1,311,073</td>
<td>1,383,366</td>
</tr>
<tr>
<td>Prepaid items</td>
<td>--</td>
<td>3,169</td>
<td>5,822</td>
<td>19,312</td>
</tr>
<tr>
<td>Inventories</td>
<td>2,234</td>
<td>--</td>
<td>--</td>
<td>4,903</td>
</tr>
<tr>
<td>Receivable due from RDA(^{(2)})</td>
<td>6,209,971</td>
<td>6,428,157</td>
<td>6,428,157</td>
<td>2,773,559</td>
</tr>
<tr>
<td>Advances from other funds</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1,198,521</td>
</tr>
<tr>
<td>Total assets</td>
<td>$9,233,870</td>
<td>$9,130,669</td>
<td>$9,322,754</td>
<td>$7,041,215</td>
</tr>
<tr>
<td>Liabilities:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts payable</td>
<td>304,099</td>
<td>$553,990</td>
<td>$601,674</td>
<td>$531,279</td>
</tr>
<tr>
<td>Accrued liabilities</td>
<td>614,772</td>
<td>529,811</td>
<td>553,037</td>
<td>546,309</td>
</tr>
<tr>
<td>Refundable deposits</td>
<td>538,868</td>
<td>513,989</td>
<td>543,442</td>
<td>716,143</td>
</tr>
<tr>
<td>Deferred revenue</td>
<td>3,698,296</td>
<td>3,911,782</td>
<td>3,957,500</td>
<td>--</td>
</tr>
<tr>
<td>Advances to other funds</td>
<td>32,743</td>
<td>--</td>
<td>--</td>
<td>641,686</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>5,156,035</td>
<td>5,509,572</td>
<td>5,655,653</td>
<td>1,826,474</td>
</tr>
<tr>
<td>Deferred Inflows of Resources:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deferred revenue- interest(^{(3)})</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>257,184</td>
</tr>
<tr>
<td>Deferred revenue- grants</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Total Deferred Inflows of Resources</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>257,184</td>
</tr>
<tr>
<td>Fund balances:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-spendable</td>
<td>2,518,609</td>
<td>2,519,544</td>
<td>2,522,197</td>
<td>2,540,590</td>
</tr>
<tr>
<td>Committed</td>
<td>567,465</td>
<td>743,683</td>
<td>899,051</td>
<td>907,519</td>
</tr>
<tr>
<td>Assigned</td>
<td>150,369</td>
<td>130,858</td>
<td>117,873</td>
<td>168,197</td>
</tr>
<tr>
<td>Unassigned</td>
<td>841,392</td>
<td>227,012</td>
<td>127,980</td>
<td>1,341,251</td>
</tr>
<tr>
<td>Total fund balances</td>
<td>4,077,835</td>
<td>3,621,097</td>
<td>3,667,101</td>
<td>4,957,557</td>
</tr>
<tr>
<td>Total Liabilities and Fund Balances</td>
<td>$9,233,870</td>
<td>$9,130,669</td>
<td>$9,322,754</td>
<td>$7,041,215</td>
</tr>
</tbody>
</table>

\(^{(1)}\) Cash and investments increased significantly from 2013 to 2014 and from 2014 to 2015 due to ____________.

\(^{(2)}\) In previous years, the City loaned money to the Former Agency’s Rockaway Beach Fund to be used for expenses necessary or incidental in carrying out the Redevelopment Plan. See “Elimination of Redevelopment Agency.”

\(^{(3)}\) Represents interest revenue receivable due from the Former Redevelopment Agency (accrued but not available). See “Elimination of Redevelopment Agency.”

The General Fund is the general operating fund of the City and is used to account for all financial resources except those required to be accounted for in another fund.

### TABLE 3
CITY OF PACIFICA
General Fund Revenues, Expenditures and Fund Balances
Fiscal Years Ending June 30, 2011 through June 30, 2015 (Audited), June 30, 2016 (Amended Budget) and June 30, 2017 (Proposed Budget)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxes</td>
<td>$15,960,878</td>
<td>$16,410,155</td>
<td>$17,060,537</td>
<td>$17,960,140</td>
<td>$17,402,332</td>
<td>$17,856,000</td>
<td>$18,253,000</td>
</tr>
<tr>
<td>Licenses and permits</td>
<td>311,879</td>
<td>389,904</td>
<td>382,281</td>
<td>501,473</td>
<td>671,478</td>
<td>758,000</td>
<td>782,000</td>
</tr>
<tr>
<td>Fines and forfeitures</td>
<td>226,650</td>
<td>173,944</td>
<td>178,727</td>
<td>300,611</td>
<td>153,031</td>
<td>159,000</td>
<td>159,000</td>
</tr>
<tr>
<td>Use of money and property</td>
<td>121,087</td>
<td>193,147</td>
<td>139,143</td>
<td>163,303</td>
<td>447,461</td>
<td>166,000</td>
<td>165,000</td>
</tr>
<tr>
<td>Intergovernmental</td>
<td>4,883,851</td>
<td>4,438,966</td>
<td>4,436,602</td>
<td>4,685,178</td>
<td>4,745,363</td>
<td>4,881,000</td>
<td>4,773,000</td>
</tr>
<tr>
<td>Charges for current services</td>
<td>1,676,210</td>
<td>1,515,050</td>
<td>1,679,210</td>
<td>1,996,318</td>
<td>1,53,031</td>
<td>159,000</td>
<td>159,000</td>
</tr>
<tr>
<td>Recreation programs</td>
<td>653,627</td>
<td>785,891</td>
<td>820,332</td>
<td>813,428</td>
<td>897,000</td>
<td>856,000</td>
<td>865,000</td>
</tr>
<tr>
<td>Other</td>
<td>1,482,036</td>
<td>1,716,427</td>
<td>1,498,677</td>
<td>1,814,062</td>
<td>1,877,900</td>
<td>1,413,000</td>
<td>1,574,491</td>
</tr>
<tr>
<td><strong>Total Revenues</strong></td>
<td><strong>25,316,218</strong></td>
<td><strong>25,632,484</strong></td>
<td><strong>26,195,509</strong></td>
<td><strong>28,234,513</strong></td>
<td><strong>28,414,020</strong></td>
<td><strong>28,454,000</strong></td>
<td><strong>29,812,000</strong></td>
</tr>
</tbody>
</table>

| Expenditures (Current)                        |                |                |                |                |                 |                      |                        |
| Public safety                                 | 14,035,745     | 12,521,995     | 12,452,200     | 12,932,962     | 14,180,058      | 14,984,687          | 15,515,781             |
| Community development                         | 1,309,463      | 1,299,904      | 1,191,424      | 1,164,171      | 1,224,793       | 1,639,764            | 2,735,871              |
| Public works                                  | 2,246,600      | 1,998,977      | 1,896,379      | 2,139,747      | 2,055,157       | 2,526,565            | 2,859,720              |
| Capital outlay                                | 150,526        | 41,672         | 69,185         | 138,400        | 142,829         | 142,829              |                        |
| **Total expenditures**                        | **25,164,085** | **22,891,265** | **22,880,497** | **23,757,437** | **25,353,522**  | **27,477,000**       | **29,675,000**         |

| Excess of revenues over expenditures          | 152,133        | 2,741,219      | 3,315,012      | 4,477,076      | 3,060,498       | 977,000               | 137,000                |

| Other financing sources (uses):               |                |                |                |                |                 |                      |                        |
| Transfers in                                  |                |                |                |                | 49,850          | 797,000               | 899,000                |
| Transfers out                                 | (3,153,276)    | (3,197,957)    | (3,269,008)    | (3,289,057)    | (1,274,000)     | (1,274,000)          | (1,036,000)            |
| **Total other financing sources (uses)**      | (3,153,276)    | (3,197,957)    | (3,269,008)    | (3,289,057)    | (1,224,150)     | (477,000)            | (137,000)              |

| Net Change in fund balance                    | (3,001,143)    | (456,738)      | 46,004         | 1,188,019      | 1,836,348       | 500,000               | -                      |

| Fund balances, July 1 (as restated)           | 7,078,978      | 4,077,835      | 3,621,097      | 3,769,538      | 4,957,557       | 6,793,905            | 7,293,905              |
| Fund balances, June 30                        | $4,077,835     | $3,621,097     | $3,667,101     | $4,957,557     | $6,793,905      | $7,293,905           | $7,293,905             |

**Source:** City of Pacifica Audited Financial Statements for fiscal years 2010-11 through 2014-15; City of Pacifica for fiscal year 2015-16 and 2016-17.
Taxes and other sources of revenue received by the City are listed in the table below. Certain general taxes currently imposed by the City are affected by Proposition 218. See “CONSTITUTIONAL AND STATUTORY LIMITATIONS ON TAXES AND APPROPRIATIONS – Articles XIIIC and XIIIID of the State Constitution.”

The following table presents the tax revenues and franchise revenues of the City’s General Fund for the last five fiscal years:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Property taxes</td>
<td>$10,564,253</td>
<td>$10,434,510</td>
<td>$10,701,810</td>
<td>$11,275,518</td>
<td>$12,200,335</td>
<td>$19,989,661</td>
<td>$20,599,453</td>
</tr>
<tr>
<td>Sales and use taxes</td>
<td>1,434,710</td>
<td>1,519,978</td>
<td>1,588,277</td>
<td>1,686,593</td>
<td>1,754,568</td>
<td>$19,289,611</td>
<td>$19,814,022</td>
</tr>
<tr>
<td>Franchise taxes</td>
<td>1,565,634</td>
<td>1,595,929</td>
<td>1,617,727</td>
<td>1,668,382</td>
<td>1,697,972</td>
<td>$18,730,407</td>
<td>$19,320,352</td>
</tr>
<tr>
<td>Other taxes</td>
<td>2,712,005</td>
<td>3,005,388</td>
<td>3,152,723</td>
<td>3,329,647</td>
<td>3,529,485</td>
<td>$18,286,941</td>
<td>$17,928,189</td>
</tr>
<tr>
<td>Transfers, Earnings, Misc.</td>
<td>517,329</td>
<td>1,004,255</td>
<td>931,744</td>
<td>738,282</td>
<td>289,026</td>
<td>$2,031,926</td>
<td>$1,991,531</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$19,989,661</td>
<td>$20,599,453</td>
<td>$20,915,854</td>
<td>$21,863,295</td>
<td>$22,791,702</td>
</tr>
</tbody>
</table>

Source: City of Pacifica.

Property Taxes

**General.** Property taxes represent the largest source of tax revenue to the City. This section describes property tax levy and collection procedures and certain information regarding historical assessed values and major property tax payers in the City. See “CONSTITUTIONAL AND STATUTORY LIMITATIONS ON TAXES AND APPROPRIATIONS” and “RISK FACTORS – Property Taxes” for a description of risks associated with the levy and collection of property tax revenues.

Property taxes have historically been the primary revenue source affected by voter initiatives and legislative actions. With approval of Proposition 13 (“Proposition 13”), property tax revenues were reduced by two-thirds and thereafter limited to 2% annual increases or the consumer price index, whichever is less. See “CONSTITUTIONAL AND STATUTORY LIMITATIONS ON TAXES AND APPROPRIATIONS – Article XIIIIA of the State Constitution” for further description of Proposition 13.

**Levy and Collection.** Property taxes are levied for each Fiscal Year on taxable real and personal property as of the preceding January 1. For assessment and collection purposes, property is classified either as “secured” or “unsecured” and is listed accordingly on separate parts of the assessment roll. The “secured roll” is that part of the assessment roll containing State-assessed public utilities property and real property the taxes on which are a lien sufficient, in the opinion of the County Assessor, to secure payment of the taxes. Other property is assessed on the “unsecured roll.”

Property taxes on the secured roll are due in two installments, on November 1 and February 1 of each Fiscal Year, and become delinquent on December 10 and April 10,
respectively. A penalty of 10% attaches immediately to all delinquent payments. Property on the secured roll with respect to which taxes are delinquent become tax defaulted on or about June 30 of the Fiscal Year. Such property may thereafter be redeemed by payment of a penalty of 1% per month to the time of redemption, plus costs and a redemption fee. If taxes are unpaid for a period of five years or more, the property is deeded to the State and may be sold at public auction.

Property taxes on the unsecured roll are due as of the January 1 lien dates and become delinquent on August 31. A 10% penalty attaches to delinquent unsecured taxes. If unsecured taxes are unpaid at 5:00 p.m. on October 31, an additional penalty of 1% attaches to them on the first day of each month until paid. The County has four ways of collecting delinquent unsecured personal property taxes: (1) a civil action against the taxpayer; (2) filing a judgment in the office of the County Clerk specifying certain facts in order to obtain a lien on certain property of the taxpayer; (3) filing a certificate of delinquency for record in the County Recorder’s office in order to obtain a lien on certain property of the taxpayer; and (4) seizure and sale of personal property, improvements or possessor interests belonging or assessed to the assesees.

Beginning in 1978-79, Proposition 13 and its implementing legislation shifted the function of property tax allocation to the counties, except for levies to support prior voted debt, and prescribed how levies on county-wide property values are to be shared with local taxing entities within each county. See “CONSTITUTIONAL AND STATUTORY LIMITATIONS ON TAXES AND APPROPRIATIONS – Article XIIIa of the State Constitution” for further description of Proposition 13.

**Teeter Plan.** San Mateo County has implemented the Alternative Method of Distribution of Tax Levies and Collections and of Tax Sale Proceeds (the “Teeter Plan”), which apply to taxes levied for the City. Under the Teeter Plan, the County guarantees that the City will receive 100% of the taxes levied for it. Any delinquencies are borne by the County, which in return collects and retains all penalties and interest which accrue on the delinquent taxes. Consequently, the City’s tax receipts do not reflect any delinquencies.

**Assessed Valuation.** All property is assessed using full cash value as defined by Article XIIIa of the State Constitution. State law provides exemptions from ad valorem property taxation for certain classes of property such as churches, colleges, non-profit hospitals, and charitable institutions. See “CONSTITUTIONAL AND STATUTORY LIMITATIONS ON TAXES AND APPROPRIATIONS.”

Future assessed valuation growth allowed under Article XIIIa (new construction, certain changes of ownership, 2% inflation) will be allocated on the basis of “situs” among the jurisdictions that serve the tax rate area within which the growth occurs. Local agencies and schools will share the growth of “base” revenues from the tax rate area. Each year’s growth allocation becomes part of each agency’s allocation in the following year.
**Assessed Valuation History.** The table below presents a recent history of the assessed value of property within the City.

<table>
<thead>
<tr>
<th>Year</th>
<th>Local Secured</th>
<th>Utility</th>
<th>Unsecured</th>
<th>Total</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006-07</td>
<td>$3,909,172,006</td>
<td>$0</td>
<td>$42,215,781</td>
<td>$3,951,387,787</td>
<td>--</td>
</tr>
<tr>
<td>2007-08</td>
<td>4,212,629,886</td>
<td>0</td>
<td>44,442,493</td>
<td>4,257,072,379</td>
<td>7.7%</td>
</tr>
<tr>
<td>2008-09</td>
<td>4,450,965,451</td>
<td>0</td>
<td>43,764,510</td>
<td>4,494,729,961</td>
<td>5.6%</td>
</tr>
<tr>
<td>2009-10</td>
<td>4,356,053,101</td>
<td>0</td>
<td>56,215,331</td>
<td>4,412,268,432</td>
<td>(1.8%)</td>
</tr>
<tr>
<td>2010-11</td>
<td>4,354,892,317</td>
<td>0</td>
<td>57,647,068</td>
<td>4,412,539,385</td>
<td>0.0%</td>
</tr>
<tr>
<td>2011-12</td>
<td>4,455,348,883</td>
<td>0</td>
<td>61,226,671</td>
<td>4,516,575,554</td>
<td>1.0%</td>
</tr>
<tr>
<td>2012-13</td>
<td>4,662,890,872</td>
<td>0</td>
<td>43,508,089</td>
<td>4,706,398,961</td>
<td>1.0%</td>
</tr>
<tr>
<td>2013-14</td>
<td>4,883,341,011</td>
<td>0</td>
<td>49,226,575</td>
<td>4,932,567,586</td>
<td>5.0%</td>
</tr>
<tr>
<td>2014-15</td>
<td>5,212,471,462</td>
<td>0</td>
<td>56,996,090</td>
<td>5,269,467,552</td>
<td>6.8%</td>
</tr>
</tbody>
</table>

Source: California Municipal Statistics, Inc.

**Major Property Taxpayers.** The following table shows the top ten property taxpayers for the 2015-16 fiscal year.

<table>
<thead>
<tr>
<th>Property Owner</th>
<th>Primary Land Use</th>
<th>2015-16 Assessed Valuation</th>
<th>% of Total (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. FPA BAF Lands End Associates LP</td>
<td>Apartments</td>
<td>$48,740,693</td>
<td>0.94%</td>
</tr>
<tr>
<td>2. Linda Mar SC LP</td>
<td>Shopping Center</td>
<td>33,715,679</td>
<td>0.65%</td>
</tr>
<tr>
<td>3. PK III Fairmont SC LP</td>
<td>Shopping Center</td>
<td>29,272,044</td>
<td>0.56%</td>
</tr>
<tr>
<td>4. Aimco Pacifica Park LP</td>
<td>Apartments</td>
<td>21,403,666</td>
<td>0.41%</td>
</tr>
<tr>
<td>5. Marymount Summit LLC</td>
<td>Apartments</td>
<td>19,614,419</td>
<td>0.38%</td>
</tr>
<tr>
<td>6. Aimco Horizons West Apartments LLC</td>
<td>Apartments</td>
<td>16,811,414</td>
<td>0.32%</td>
</tr>
<tr>
<td>7. Bay Apartment Communities Inc.</td>
<td>Apartments</td>
<td>14,386,157</td>
<td>0.28%</td>
</tr>
<tr>
<td>8. LBN Properties LP</td>
<td>Apartments</td>
<td>13,733,055</td>
<td>0.26%</td>
</tr>
<tr>
<td>9. Aimco Esplanade Ave. Apartments LLC</td>
<td>Apartments</td>
<td>13,488,761</td>
<td>0.26%</td>
</tr>
<tr>
<td>10. Upsky Lighthouse Hotel LLC</td>
<td>Hotel</td>
<td>12,994,545</td>
<td>0.25%</td>
</tr>
<tr>
<td>11. Pacific View Apartments LP</td>
<td>Apartments</td>
<td>11,809,658</td>
<td>0.23%</td>
</tr>
<tr>
<td>12. CCF SP Skyline LLC</td>
<td>Apartments</td>
<td>11,551,273</td>
<td>0.22%</td>
</tr>
<tr>
<td>13. GRG/Pacific Ventures Ltd.</td>
<td>Apartments</td>
<td>10,571,413</td>
<td>0.20%</td>
</tr>
<tr>
<td>14. Sonora Shores III LLC</td>
<td>Undeveloped</td>
<td>9,845,166</td>
<td>0.19%</td>
</tr>
<tr>
<td>15. Marymount Gateway Apts. LLC</td>
<td>Apartments</td>
<td>9,712,772</td>
<td>0.19%</td>
</tr>
<tr>
<td>16. Harry B. Lewis</td>
<td>Apartments</td>
<td>7,820,496</td>
<td>0.15%</td>
</tr>
<tr>
<td>17. MHC San Francisco RV Resort</td>
<td>Mobile Home Park</td>
<td>7,538,709</td>
<td>0.14%</td>
</tr>
<tr>
<td>18. Pacific Oaks Associates</td>
<td>Apartments</td>
<td>6,492,271</td>
<td>0.12%</td>
</tr>
<tr>
<td>19. Millard W. Tong Trust</td>
<td>Rural</td>
<td>6,472,256</td>
<td>0.12%</td>
</tr>
<tr>
<td>20. Palmetto 1300 LLC</td>
<td>Mobile Home Park</td>
<td>6,095,148</td>
<td>0.12%</td>
</tr>
</tbody>
</table>

(1) 2015-16 Local Secured Assessed Valuation: $5,212,471,462.
Source: California Municipal Statistics, Inc.
**Motor Vehicle In-Lieu Tax.** The State imposes the vehicle license fee (the “VLF”), which is the fee paid annually in lieu of personal property taxes on a vehicle, and distributed to cities and counties. State residents pay a fee to the State each year equal to 0.65% of the depreciated value of their motor vehicles. The VLF was originally a personal property tax collected at the local level. Collection was taken over by the State in the interests of efficiency, but the revenue remained local. During the 1990s, the fee gradually was reduced by the State from 2.0% to 0.65%. What otherwise would have been a revenue loss to local agencies was “backfilled” by payments from the State. The backfill payments were replaced in 2004 with a like amount of payments to the City as part of the property tax; this portion of the VLF (90% of the total) will increase in proportion to future assessed value growth. The remaining 10% is remitted to the City monthly by the State on the basis of population.

**Sales and Use Taxes**

Sales and use taxes represent the third largest source of tax revenue to the City. The sales tax is an excise tax imposed on retailers for the privilege of selling or leasing tangible personal property. The use tax is an excise tax imposed for the storage, use, or other consumption of tangible personal property purchased from any retailer. The total sales tax rate within the City is 9.0%, as of April 1, 2016. The proceeds of sales and uses taxes imposed within the City are distributed by the State to various agencies, with the City receiving 1.0% of the amount collected. Prior to 2015-16, agencies received less 0.25%, which was shifted to the State pursuant to a mechanism commonly known as “Triple Flip.” The 0.25% reduction in local sales tax was used to pay State economic recovery bonds, but cities and counties were then provided with *ad valorem* property tax revenues in lieu of these revenues.

Collection of the sales and use tax is administered by the California State Board of Equalization. Under its procedures, the State Board of Equalization projects receipts of the sales and use tax on a quarterly basis and remits an advance of the receipts of the sales and use tax to the City on a monthly basis. The amount of each monthly advance is based upon the State Board of Equalization’s quarterly projection. During the last month of each quarter, the State Board of Equalization adjusts the amount remitted to reflect the actual receipts of the sales and use tax for the previous quarter. The State Board of Equalization receives an administrative fee based on the cost of services provided by the Board to the City in administering the City’s sales tax, which is deducted from revenue generated by the sales and use tax before it is distributed to the City.
Sales Tax Rates. Currently, taxable transactions in the City are subject to the following sales and use tax, of which the City’s share is only a portion. The State collects and administers the tax, and makes distributions on taxes collected within the City, as follows:

**TABLE 7**
**CITY OF PACIFICA**
**Sales Tax Rates**
**As of April 1, 2016**

<table>
<thead>
<tr>
<th>Tax Type</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>State (General Fund)</td>
<td>6.250%</td>
</tr>
<tr>
<td>State (Fiscal Recovery)</td>
<td>0.250</td>
</tr>
<tr>
<td>County Transportation</td>
<td>1.00</td>
</tr>
<tr>
<td>County Transit District</td>
<td>0.500</td>
</tr>
<tr>
<td>City</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9.000%</strong></td>
</tr>
</tbody>
</table>

*Source: California State Board of Equalization.*

Application of Sales Tax. Sales and use taxes are complementary taxes; when one applies, the other does not. In general, the statewide sales tax applies to gross receipts of retailers from the sale of tangible personal property in the State. The use tax is imposed on the purchase, for storage, use or other consumption in the State of tangible personal property from any retailer. The use tax generally applies to purchases of personal property from a retailer outside the State where the use will occur within the State. The sales tax is imposed upon the same transactions and items as the statewide sales tax and the statewide use tax.

Certain transactions are exempt from the State sales tax, including sales of the following products:

- food products for home consumption;
- prescription medicine;
- newspapers and periodicals;
- edible livestock and their feed;
- seed and fertilizer used in raising food for human consumption; and
- gas, electricity and water when delivered to consumers through mains, lines and pipes.

This is not an exhaustive list of exempt transactions. A comprehensive list can be found in the State Board of Equalization’s February 2012 Publication No. 61 entitled “Sales and Use Taxes: Exemptions and Exclusions,” which can be found on the State Board of Equalization’s website at http://www.boe.ca.gov/.

Sales Tax Collection Procedures. Collection of the sales and use tax is administered by the State Board of Equalization. According to the State Board of Equalization, it distributes quarterly tax revenues to cities, counties and special districts using the following method:

Using the prior year’s like quarterly tax allocation as a starting point, the Board first eliminates nonrecurring transactions such as fund transfers, audit payments and refunds, and then adjusts for growth, in order to establish the estimated base amount. The State Board of Equalization disburses 90% to each local jurisdiction in three monthly installments (advances).
prior to the final computation of the quarter’s actual receipts. Ten percent is withheld as a reserve against unexpected occurrences that can affect tax collections (such as earthquakes, fire or other natural disaster) or distributions of revenue such as unusually large refunds or negative fund transfers. The first and second advances each represent 30% of the 90% distribution, while the third advance represents 40%. One advance payment is made each month, and the quarterly reconciliation payment (clean-up) is distributed in conjunction with the first advance for the subsequent quarter. Statements showing total collections, administrative costs, prior advances and the current advance are provided with each quarterly clean-up payment.

Under the Sales and Use Tax Law, all sales and use taxes collected by the State Board of Equalization under a contract with any city, city and county, redevelopment agency, or county are required to be transmitted by the State Board of Equalization to such city, city and county, redevelopment agency, or county periodically as promptly as feasible. These transmittals are required to be made at least twice in each calendar quarter.

Under its procedures, the State Board of Equalization projects receipts of the sales and use tax on a quarterly basis and remits an advance of the receipts of the sales and use tax to the City on a monthly basis. The amount of each monthly advance is based upon the State Board of Equalization’s quarterly projection. During the last month of each quarter, the State Board of Equalization adjusts the amount remitted to reflect the actual receipts of the sales and use tax for the previous quarter.

The State Board of Equalization receives an administrative fee based on the cost of services provided by the Board to the City in administering the City’s sales tax, which is deducted from revenue generated by the sales and use tax before it is distributed to the City.

**History of Taxable Transactions.** Total taxable sales during calendar year 2014 in the City were reported to be $206,527,000, a 2.8% increase over the total taxable sales of $200,933,000 reported during calendar year 2013. Summaries of historic taxable sales within the City and the County during the past five years in which data is available are shown in the following table.

<table>
<thead>
<tr>
<th>TABLE 9</th>
<th>CITY OF PACIFICA</th>
<th>Taxable Sales by Category</th>
<th>(Dollars in Thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Stores</td>
<td>$24,665</td>
<td>$25,723</td>
<td>$26,201</td>
</tr>
<tr>
<td>Eating &amp; Drinking Places</td>
<td>30,244</td>
<td>30,168</td>
<td>33,666</td>
</tr>
<tr>
<td>Building Materials</td>
<td>3,856</td>
<td>3,737</td>
<td>3,863</td>
</tr>
<tr>
<td>Auto Dealers &amp; Supplies</td>
<td>3,637</td>
<td>3,819</td>
<td>4,095</td>
</tr>
<tr>
<td>Service Stations</td>
<td>39,755</td>
<td>49,578</td>
<td>52,508</td>
</tr>
<tr>
<td>Other Retail Stores</td>
<td>33,749</td>
<td>34,195</td>
<td>34,441</td>
</tr>
<tr>
<td>All Other Outlets</td>
<td>32,277</td>
<td>30,113</td>
<td>33,155</td>
</tr>
<tr>
<td>Total</td>
<td>$168,183</td>
<td>$177,333</td>
<td>$187,929</td>
</tr>
</tbody>
</table>


**Franchise Taxes.** Franchise taxes represent the third largest source of tax revenues for the City. Several State statutes provide cities with the authority to impose fees on privately-owned utility companies and other businesses for the privilege of using city right-of-way.
Gas Taxes

**General.** The State imposes a 39.5-cent per gallon tax on gasoline and 10-cent per gallon on diesel fuel. These funds are apportioned to cities and counties in the State. Each City is allocated funds on a population basis in accordance with Section 2103, 2105, 2106, 2107 and 2107.5 of the California Street and Highway Code. Population is determined by the latest Federal Census or survey requested and certified by the Cities and conducted by the State Department of Finance. Expenditures may be made for construction or purchasing of right-of-way on minor streets. Expenditures of money apportioned under Section 2107 may be made for any street purpose. Under Section 2107.5 a flat allocation of $6,000 per year is granted the City for street engineering. The use of gas tax revenues is restricted to allowable street expenditures under the California Street and Highway Code. The City accounts for its gas tax revenues and expenditures in the Gas Tax Fund.

The following table shows a five-year summary of the City’s Gas Tax Fund.

<table>
<thead>
<tr>
<th>TABLE 8</th>
<th>CITY OF PACIFICA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas Tax Revenues</td>
<td></td>
</tr>
<tr>
<td>Total Revenues</td>
<td>$1,858,108</td>
</tr>
<tr>
<td>Total Expenditures</td>
<td>(1,563,440)</td>
</tr>
<tr>
<td>Total Other Sources (Uses)</td>
<td>(597,039)</td>
</tr>
<tr>
<td>Net Change in Fund Balance</td>
<td>(302,371)</td>
</tr>
<tr>
<td>Beginning Fund Balance</td>
<td>3,034,952</td>
</tr>
<tr>
<td>Ending Fund Balance</td>
<td>2,732,581</td>
</tr>
</tbody>
</table>

(1) An increase of $649,000 in the Gas Tax Fund in fiscal year 2013-14 is attributed to the receipt of additional Highway Users Tax due to the State’s calculation of the fuel excise swap and the reduction of street projects for the fiscal year. (2) A decrease of $2.5 million in the Gas Tax Fund in fiscal year 2014-15 is attributed to the separation of the Gas Tax and Street Construction Funds presentation in City’s audited financial statement in this year, and a reduction in transfers out of $600,000.

**Source:** City of Pacifica, Audited Financial Statements for fiscal years 2010-11 through 2014-15.

**Transient Occupancy Tax.** The transient occupancy tax, sometimes referred to as a hotel tax, is imposed on occupants for the privilege of occupying rooms in hotels, motels, inns and other taxed properties. The City’s current transient occupancy tax is 12%.

**Excess Education Augmentation Revenue**

The County is one of the few counties in the State to have Excess Education Augmentation Revenue funds ("Excess ERAF Funds"). ERAF Funds are collected by the County for education needs, and are sometimes in excess of the required amount. Revenues to the City date back to 1999-00, and range from zero in 2003-04 to a high of $1.8 million in 2014-15. Excess ERAF Funds are accounted for in a special revenue fund in the City’s audited financial statements. For fiscal year 2015-16 the City estimates $1,780,000 in Excess ERAF Funds.
State Budget

Although the City does not receive a significant portion of its annual revenues directly from the State, the State’s financial condition and budget policies affect communities and local public agencies throughout the State. At various times, the State has experienced significant financial and budgetary stress.

Recent State budgets have been balanced and balanced budgets are projected for the foreseeable future, but there can be no certainty that budget-cutting strategies such as those used in prior years will not be used in the future should the State budget again experience stresses. To the extent that the State budget process results in reduced revenues to the City in the future, the City could be required to make adjustments to its budget.

Elimination of Redevelopment Agency

The Pacifica Redevelopment Agency (the “Former Agency”) was eliminated on February 1, 2012 under the provisions of AB 1X 26 and AB 1484 as were all other redevelopment agencies in the State. The City accepted the role of Successor Agency to the Redevelopment Agency per Council action on January 23, 2012.

Prior to the dissolution of the former redevelopment agency, the General Fund had loaned money to the former Redevelopment Agency Rockaway Beach Fund to carry out redevelopment activities. As a result of the dissolution, the loan receivable is now recorded as a loan receivable from the Successor Agency Private-purpose Trust Fund. Interest accrues on the original advance at the current Local Agency Investment Fund rate. At June 30, 2015, outstanding loans totaled $2,466,520 ($2,341,185 in principal and $125,335 in accrued interest).

Outstanding General Fund Debt

The City's general fund debt includes the 2008 Certificates (expected to be refinanced with the proceeds of the Certificates described herein), 2010 Pension Bonds, and a capital lease, each described below. For a description of certain other long-term debts of the City, see “APPENDIX C - Comprehensive Annual Financial Report of the City for Fiscal Year Ended June 30, 2015” and particularly Note 6 of the Notes to the Basic Financial Statements therein.

Certificates of Participation. As previously described herein under the heading “FINANCING PLAN,” on July 31, 2008, the City caused to be executed and delivered $19,815,000 original principal amount of the 2008 Certificates, which bear interest between 3.000% and 5.375%, are payable semi-annually on January 1 and July 1, and have a final maturity of January 1, 2037. The 2008 Certificates were executed and delivered in connection with the interest rate conversion of auction rate securities initially executed and delivered on May 16, 2006, as well as to finance the construction, renovation and expansion of certain City public street improvement projects and for certain other related purposes. The 2008 Certificates are expected to be prepaid in full with the proceeds of the Certificates.

Taxable Pension Obligation Bonds. In May 2010, the City issued $20,510,000 principal amount of Taxable Pension Obligation Bonds (the “2010 Pension Bonds”) bearing interest between 1.425% and 6.899% and payable semiannually on June 1 and December 1, with a final maturity date of June 1, 2030. These bonds were used to refinance miscellaneous
and safety employee pension obligations. Annual debt service requirements to maturity of the 2010 Pension Bonds are shown on the following table.

### TABLE 9
**CITY OF PACIFICA**
**2010 Pension Bonds Remaining Debt Service**

<table>
<thead>
<tr>
<th>Fiscal Year Ended</th>
<th>2010 Pension Bonds Principal</th>
<th>2010 Pension Bonds Interest</th>
<th>Total Debt Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>$1,409,090</td>
<td>$791,616</td>
<td>$2,200,706</td>
</tr>
<tr>
<td>2017</td>
<td>1,555,316</td>
<td>719,639</td>
<td>2,274,955</td>
</tr>
<tr>
<td>2018</td>
<td>855,202</td>
<td>640,195</td>
<td>1,495,397</td>
</tr>
<tr>
<td>2019</td>
<td>957,118</td>
<td>591,002</td>
<td>1,548,120</td>
</tr>
<tr>
<td>2020</td>
<td>372,212</td>
<td>534,035</td>
<td>906,247</td>
</tr>
<tr>
<td>2021-2025</td>
<td>2,791,594</td>
<td>2,240,945</td>
<td>5,032,539</td>
</tr>
<tr>
<td>2026-2030</td>
<td>4,772,294</td>
<td>1,036,939</td>
<td>5,809,233</td>
</tr>
<tr>
<td>Total</td>
<td>$12,712,826</td>
<td>$6,554,371</td>
<td>$19,267,197</td>
</tr>
</tbody>
</table>

*Capital Lease.* On November 1, 2012, the City entered into a lease/purchase agreement with Holman Capital Corporation for energy efficiency measures at various City-owned buildings. The effective interest rate on the lease is 4.0% and lease payments are payable semiannually on November 15 and May 15, and commenced on May 15, 2013. Annual lease payment requirements are shown on the following table.

### TABLE 10
**CITY OF PACIFICA**
**Energy Retrofit Lease- Remaining Lease Payments**

<table>
<thead>
<tr>
<th>Fiscal Year Ended</th>
<th>Principal</th>
<th>Interest</th>
<th>Total Lease Payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>$107,290</td>
<td>$35,678</td>
<td>$142,968</td>
</tr>
<tr>
<td>2017</td>
<td>111,624</td>
<td>31,344</td>
<td>142,968</td>
</tr>
<tr>
<td>2018</td>
<td>116,134</td>
<td>26,834</td>
<td>142,968</td>
</tr>
<tr>
<td>2019</td>
<td>120,825</td>
<td>22,142</td>
<td>142,968</td>
</tr>
<tr>
<td>2020</td>
<td>125,707</td>
<td>17,261</td>
<td>142,968</td>
</tr>
<tr>
<td>2021-2023</td>
<td>336,934</td>
<td>20,484</td>
<td>357,418</td>
</tr>
<tr>
<td>Total</td>
<td>$918,514</td>
<td>$153,743</td>
<td>$1,072,258</td>
</tr>
</tbody>
</table>

### Direct and Overlapping Bonded Debt

Set forth following is a direct and overlapping debt report (the “Debt Report”) prepared by California Municipal Statistics, Inc. and effective May 1, 2016. The Debt Report is included for general information purposes only. The City has not reviewed the Debt Report for completeness or accuracy and makes no representation in connection therewith.

The Debt Report generally includes long-term obligations sold in the public credit markets by public agencies whose boundaries overlap the boundaries of the City in whole or in part. Such long-term obligations generally are not payable from revenues of the City (except as indicated) nor are they necessarily obligations secured by land within the City. In many cases, long-term obligations issued by a public agency are payable only from the general fund or other revenues of such public agency.
The contents of the Debt Report are as follows: (1) the first column indicates the public agencies which have outstanding debt as of the date of the Debt Report and whose territory overlaps the City; (2) the second column shows the percentage of the assessed valuation of the overlapping public agency identified in column 1 which is represented by property located within the City; and (3) the third column is an apportionment of the dollar amount of each public agency’s outstanding debt (which amount is not shown in the table) to property in the City, as determined by multiplying the total outstanding debt of each agency by the percentage of the City’s assessed valuation represented in column 2.

**TABLE 11**

**CITY OF PACIFICA**

**Statement of Direct and Overlapping Debt**

**As of May 1, 2016**

2015-16 Assessed Valuation: $5,269,467,552

<table>
<thead>
<tr>
<th>OVERLAPPING TAX AND ASSESSMENT DEBT:</th>
<th>% Applicable</th>
<th>Debt 5/1/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Mateo Community College District</td>
<td>2.954%</td>
<td>$19,035,104</td>
</tr>
<tr>
<td>Jefferson Union High School District</td>
<td>30.320</td>
<td>46,595,408</td>
</tr>
<tr>
<td>Jefferson School District</td>
<td>1.280</td>
<td>1,153,920</td>
</tr>
<tr>
<td>Pacifica Union School District (Laguna Salada)</td>
<td>99.891</td>
<td>13,274,802</td>
</tr>
<tr>
<td>TOTAL OVERLAPPING TAX AND ASSESSMENT DEBT</td>
<td></td>
<td>$80,059,234</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIRECT AND OVERLAPPING GENERAL FUND DEBT:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>San Mateo County General Fund Obligations</td>
<td>2.954</td>
<td>$12,771,909</td>
</tr>
<tr>
<td>San Mateo County Board of Education Certificates of Participation</td>
<td>2.954</td>
<td>308,102</td>
</tr>
<tr>
<td>San Mateo County Flood Control District Certificates of Participation</td>
<td>0.684</td>
<td>128,079</td>
</tr>
<tr>
<td>Jefferson Union High School District Certificates of Participation</td>
<td>30.320</td>
<td>479,056</td>
</tr>
<tr>
<td><strong>City of Pacifica Certificates of Participation</strong></td>
<td><strong>100.000</strong></td>
<td><strong>16,210,000</strong>(1)</td>
</tr>
<tr>
<td><strong>City of Pacifica Pension Obligations</strong></td>
<td><strong>100.000</strong></td>
<td><strong>14,345,000</strong></td>
</tr>
<tr>
<td><strong>TOTAL DIRECT AND OVERLAPPING GENERAL FUND DEBT</strong></td>
<td></td>
<td><strong>$44,242,146</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERLAPPING TAX INCREMENT DEBT (Successor Agency):</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>100.000</strong></td>
<td><strong>$1,310,000</strong></td>
</tr>
</tbody>
</table>

| COMBINED TOTAL DIRECT AND OVERLAPPING DEBT | **$125,611,380**(2) |

Ratios to 2015-16 Assessed Valuation:

- Total Overlapping Tax and Assessment Debt ...........................................1.52%
- Combined Direct Debt ($30,555,000) ..................................................0.58%
- Combined Total Debt ..............................................................................2.38%
- Ratios to Redevelopment Successor Agency Incremental Valuation ($37,070,078):
  - Total Overlapping Tax Increment Debt ..............................................3.53%

(1) Excludes issue to be sold.
(2) Excludes tax and revenue anticipation notes, enterprise revenue, mortgage revenue and non-bonded capital lease obligations.

Source: California Municipal Statistics, Inc.
Employee Relations

As of fiscal year 2015-16, the City had 189 full-time equivalent employees. The following table summarizes the employee groups, which are represented by collective bargaining agreements.

<table>
<thead>
<tr>
<th>Labor Group</th>
<th>Contract Status</th>
<th>Contract Expiration Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamsters Battalion Chiefs</td>
<td>In negotiation</td>
<td>6/30/2018*</td>
</tr>
<tr>
<td>Teamsters 350 – Department Directors</td>
<td>In negotiation</td>
<td>6/30/2018*</td>
</tr>
<tr>
<td>Teamsters 350 - Managers and Supervisors</td>
<td>In negotiation</td>
<td>6/30/2018*</td>
</tr>
<tr>
<td>Teamsters 856 – Miscellaneous</td>
<td>Settled</td>
<td>6/30/2018</td>
</tr>
<tr>
<td>Teamsters 856 – Wastewater</td>
<td>Settled</td>
<td>6/30/2018</td>
</tr>
<tr>
<td>Pacifica Police Officer Association</td>
<td>Settled</td>
<td>6/30/2018</td>
</tr>
<tr>
<td>Pacifica Police Supervisor Association</td>
<td>Settled</td>
<td>6/30/2018</td>
</tr>
<tr>
<td>Police Captains Association</td>
<td>Settled</td>
<td>6/30/2018</td>
</tr>
<tr>
<td>IAFF 2400 – Pacifica Fire Fighters</td>
<td>Settled</td>
<td>12/31/2018</td>
</tr>
</tbody>
</table>

*Proposed.
Source: City of Pacifica.

Risk Management

The City maintains an internal service fund to account for its general liability and workers' compensation claims, automobile, property, and unemployment insurance.

**Worker’s Compensation.** The City is a member of the Municipal Pooling Authority of Northern California (the “Pooling Authority”), which pools risks under the terms of a joint powers agreement with 31 other cities and governmental agencies. The City has no workers' compensation deductible for claims and the Authority covers claims up to $500,000. The Pooling Authority purchases excess insurance from $500,000 to the statutory limit. The City paid premiums of $746,503 during fiscal year end June 30, 2015 for workers' compensation and excess workers' compensation coverage.

**General Liability.** On July 1, 1986, the City became a member of the Association of Bay Area Governments (“ABAG”) Pooled Liability Assurance Network (“PLAN”). PLAN is a not-for-profit organization established to provide certain levels of liability insurance coverage, claims risk management services, and legal defense to thirty-one San Francisco Bay Area cities. PLAN is governed by a Board of Directors comprised of officials appointed by each participating member and is administered by ABAG. Complete financial statements for ABAG PLAN may be obtained from their offices at: ABAG PLAN, Finance Department, P. O. Box 2050, Oakland, CA 94604.

The City paid premiums of $375,313 during fiscal year 2014-15 for general liability and property coverage in excess of the City’s self-insured retention. Members may receive rebates when declared by ABAG or, in the event excess liability claims against ABAG exceed available resources, may be required to make additional contributions.
The City is self-insured for the first $50,000 of general and property liability for each occurrence, and the excess (up to $10,000,000 for each occurrence and annual aggregate) is covered through the City's participation in the ABAG PLAN.

**Dental.** On July 1, 1988, the City established a program of self-insurance with respect to Employee’s Dental Insurance, in accordance with the provisions of a Memorandum of Understanding between the City and all full-time employees. This program is administered by TLC Administrators and provides claims review and processing. The maximum benefit per employee per plan year varies between $1,500 and $2,000; the maximum benefit per dependent per plan year is also between $1,500 and $2,000.

The City maintains an internal service fund to account for these insurance programs. Claims expenses and liabilities are reported when it is probable that a loss has occurred and the amount of that loss can be reasonably estimated. These losses include an estimate of claims that have been incurred but not reported. Accrued insurance losses of $124,919 were recorded at June 30, 2015 for general liability programs.

**Other Post-Employment Benefits (“OPEB”)**

**General.** The City participates in the California Public Employees’ Retirement System (“CalPERS”) medical program. See “APPENDIX C – COMPREHENSIVE ANNUAL REPORT OF THE CITY FOR THE FISCAL YEAR ENDED JUNE 30, 2015 - Note 8” for a description of the City’s employees eligible for participation in its CalPERS program.

**Funding Policy.** Under its arrangement with the CalPERS medical program the City contributes the minimum amount provided under Government Code Section 22825 of the Public Employees Medical and Hospital Care Act. Retirees must contribute any premium amounts in excess of the City contribution. Retired Department Directors, retired Management Unit employees, unrepresented managers, and confidential employees receive an additional $100 monthly benefit. The City’s policy is to contribute an amount sufficient to pay the current year’s minimum employer contribution only. For fiscal year 2014-15, the City contributed $103,933, which covered the current year’s minimum employer contribution, but did not include any additional prefunding of benefits.

**Annual OPEB and Net OPEB Obligation.** The City’s annual Other Postemployment Benefit (“OPEB”) cost (expense) is calculated based on the annual required contribution of the employer (“ARC”), and an amount actuarially determined in accordance with the parameters of GASB Statement No. 45. The ARC represents a level of funding that, if paid on an ongoing basis, is projected to cover normal cost each year and amortize any unfunded actuarial liabilities (or funding excess) over a period not to exceed thirty years, on a closed basis. The following table shows the components of the City’s annual OPEB cost for the fiscal year, the amount actually contributed to the plan, and changes in the City’s net OPEB obligation.
TABLE 13
CITY OF PACIFICA
Components of OPEB Cost
Fiscal Year 2014-15

<table>
<thead>
<tr>
<th>Component</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual required contribution (ARC)</td>
<td>$351,000</td>
</tr>
<tr>
<td>Interest on OPEB obligation</td>
<td>101,509</td>
</tr>
<tr>
<td>Adjustment to annual required contribution</td>
<td>(124,000)</td>
</tr>
<tr>
<td>Annual OPEB cost</td>
<td>328,509</td>
</tr>
<tr>
<td>Contributions made</td>
<td>(103,933)</td>
</tr>
<tr>
<td>Increase in net OPEB obligation</td>
<td>224,576</td>
</tr>
<tr>
<td>Net OPEB asset- beginning of year</td>
<td>2,537,737</td>
</tr>
<tr>
<td>Net OPEB asset- end of year</td>
<td>$2,762,313</td>
</tr>
</tbody>
</table>


The City’s annual OPEB cost, the percentage of annual OPEB cost contributed to the plan, and the net OPEB obligation for fiscal year 2014-15 and the two preceding years is as follows:

TABLE 14
CITY OF PACIFICA
Annual OPEB Cost, Percentage Contributed and Net OPEB Obligation
Fiscal Year 2014-15

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Annual OPEB Cost</th>
<th>% of Annual OPEB Contributed</th>
<th>Net OPEB Obligation</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/30/2013</td>
<td>$331,757</td>
<td>26.1%</td>
<td>$2,318,931</td>
</tr>
<tr>
<td>6/30/2013</td>
<td>312,757</td>
<td>30.0</td>
<td>2,537,737</td>
</tr>
<tr>
<td>6/30/2013</td>
<td>328,509</td>
<td>11.9</td>
<td>2,762,313</td>
</tr>
</tbody>
</table>


**Funded Status and Progress.** The schedules of funding progress are presented as Required Supplementary Information following the notes to the basic financial statements present multi-year trend information about whether the actuarial value of plan assets is increasing or decreasing over time relative to the actuarial accrued liability for benefits.

In the June 30, 2013 actuarial valuation, the entry normal cost method was used. The actuarial assumptions included a 3.0% general inflation rate, a 4.0% investment rate of return, which is the expected long-term investment returns on plan assets, a n annual increase in the minimum monthly benefit (healthcare cost trend rate) of 4.5%, and a 3.25% annual rate of increase in payroll. The actuarial value of assets is not applicable (no assets as of the valuation date). The UAAL is being amortized as a flat percentage of covered payroll over thirty years, on a closed basis. The remaining amortization period at June 30, 2015 was 23 years.
### TABLE 15
CITY OF PACIFICA
Schedule of Funding Progress
Fiscal Year 2014-15

<table>
<thead>
<tr>
<th>Valuation Date</th>
<th>Accrued Liability</th>
<th>Actuarial Value of Assets</th>
<th>Unfunded Liability</th>
<th>Funded Status</th>
<th>Annual Covered Payroll</th>
<th>UAAL as a % of Covered Payroll</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/01/2007</td>
<td>$5,127,629</td>
<td>$0</td>
<td>$5,127,629</td>
<td>0%</td>
<td>$15,457,782</td>
<td>33.2%</td>
</tr>
<tr>
<td>07/01/2010</td>
<td>3,443,589</td>
<td>0</td>
<td>3,443,589</td>
<td>0%</td>
<td>15,929,273</td>
<td>21.6%</td>
</tr>
<tr>
<td>07/01/2013</td>
<td>3,701,000</td>
<td>0</td>
<td>3,701,000</td>
<td>0%</td>
<td>13,745,000</td>
<td>26.9%</td>
</tr>
</tbody>
</table>

*Source: City’s Audited Financial Statements for fiscal year 2014-15.*

Actuarial valuations of an ongoing plan involve estimates of the value of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality, and the healthcare cost trend. Amounts determined regarding the funded status of the plan and the annual required contributions of the employer are subject to continual revision as actual results are compared with past expectations and new estimates are made about the future. The schedule of funding progress, presented as required supplementary information following the notes to the basic financial statements, presents multi-year trend information about whether the actuarial value of plan assets is increasing or decreasing over time relative to the actuarial accrued liabilities for benefits.

**City’s Pension Plans**

The City has pension plans with CalPERS and Public Agency Retirement Services (“PARS”). Note 9 in the City’s audited financial statements attached here as APPENDIX C summarizes, among other things, actuarial assumptions used in determining pension liabilities, as well as schedules showing changes in net pension liabilities.

**Implementation of GASB Nos. 68 and 71.** Commencing with fiscal year ended June 30, 2015, the City implemented the provisions of GASB Statement No. 68, as amended by GASB Statement No. 71, which imposes certain new pension accounting and financial reporting requirements in the notes to its audited financial statements commencing with financial statements for fiscal years ending after June 30, 2014. Statement No. 68, as amended, generally requires the City to recognize its proportionate share of the unfunded pension obligations by recognizing a net pension liability measured as of a date (the measurement date) no earlier than the end of its prior fiscal year. As a result of the implementation of GASB Statement Nos. 68 and 71, the City was required to restate its beginning net positions of the governmental activities by $46,450,798.

**CalPERS.** All qualified permanent and probationary employees are eligible to participate in the City’s defined benefit pension plan provided by CalPERS as follows:

- Miscellaneous (agent multiple-employer plan)
- Safety Police (cost-sharing multiple-employer plan)
- Pepra Safety Police (cost-sharing multiple-employer plan)
- Safety Fire (cost-sharing multiple-employer plan)
- Pepra Safety Fire (cost-sharing multiple-employer plan)
These plans are administered by CalPERS, which acts as a common investment and administrative agent for its participating member employees. Benefit provisions under the Plans are established by State statute and City resolution. CalPERS issues publicly available reports that include a full description of the pension plans regarding benefit provisions, assumptions and membership information that can be found on the CalPERS website at www.calpers.com.

Benefits Provided. CalPERS provides service retirement and disability benefits, annual cost of living adjustments and death benefits to plan members, who must be public employees and beneficiaries. Benefits are based on years of credited service, equal to one year of full time employment. Members with five years of total service are eligible to retire at age 50 with statutorily reduced benefits. All members are eligible for non-duty disability benefits after 10 years of service. The death benefit is one of the following: the Basic Death Benefit, the 1957 Survivor Benefit, or the Optional Settlement 2W Death Benefit. The cost of living adjustments for each plan a reapplied as specified by the Public Employees' Retirement Law. At June 30, 2015, 454 Miscellaneous and 279 Safety employees were covered under the CalPERS plan. The Plans’ provisions and benefits in effect at June 30, 2015, are summarized in “APPENDIX C – COMPREHENSIVE ANNUAL REPORT OF THE CITY FOR THE FISCAL YEAR ENDED JUNE 30, 2015- Note 9”

Contributions. The City’s contributions to CalPERS for fiscal year 2014-15 amounted to the following amounts:

- Miscellaneous- $1,081,226
- Safety- Police- 805,359
- Safety- Police Pepra- 49,695
- Safety- Fire- 563,104
- Safety- Fire PEPRA- 19,572

On May 19, 2010, the City issued $20,510,000 of Taxable Pension Obligation Bonds. The net proceeds of the 2010 Pension Bonds were used to provide funds to allow the City to refund its current unfunded accrued actuarial liability with respect to certain retirement benefits accruing to members of CalPERS.

PARS. The PARS Retirement Enhancement Plan (“REP”) was implemented July 1, 2003 and closed to new participants hired after January 1, 2012. Eligibility to participate in REP is for the following positions: City Attorney, Administrative Services Director, non-safety Department Director or non-safety management employee of the City on or after July 1, 2003. Participants receiving the benefits are non-safety Management Group Employees. This plan is separate from CalPERS and is established as a 401(a) Defined Benefit Plan. The REP is administered by PARS.

The REP provides a benefit equal to 0.5% of final average compensation for City management service earned after plan inception (July 1, 2003). In addition, any City employee in a covered management position as of the date of plan inception will receive up to an additional 10 years of service for any City service (management or non-management) prior to July 1, 2003. Eligibility for an immediate benefit is defined as reaching age 55, completing five years of fulltime City management service, and retiring concurrently from both the City and CalPERS after leaving City employment. At June 30, 2015 12 of the City’s employees were covered under the PARS REP program.
Contributions. The City makes all contributions necessary to fund the benefits available under the REP. Contributions to REP for fiscal year 2014-15 amounted to $159,573.

Pension Reform Act of 2013 (Assembly Bill 340). On September 12, 2012, Governor Brown signed AB 340, a bill that enacted the California Public Employees' Pension Reform Act of 2013 ("PEPRA") and that also amended various sections of the State Education and Government Codes. AB 340 (i) increases the retirement age for new State, school, and city and local agency employees depending on job function, (ii) caps the annual PERS pension benefit payouts, (iii) addresses numerous abuses of the system, and (iv) requires State, school, and certain city and local agency employees to pay at least half of the costs of their PERS pension benefits. PEPRA applies to all public employers except the University of California, charter cities and charter counties (except to the extent they contract with PERS.)

The provisions of AB 340 went into effect on January 1, 2013 with respect to new State, school, and city and local agency employees hired on that date and after; existing employees who are members of employee associations, including employee associations of the City, will have a five-year window to negotiate compliance with AB 340 through collective bargaining. If no deal is reached by January 1, 2018, a city, public agency or school district could force employees to pay their half of the costs of PERS pension benefits, up to 8% of pay for civil workers and 11% or 12% for public safety workers.

PERS has predicted that the impact of AB 340 on employers, including the City and other employers in the PERS system, and employees will vary, based on each employer’s current level of benefits. To the extent that the new formulas lower retirement benefits, employer contribution rates could decrease over time as current employees retire and employees subject to the new formulas make up a larger percentage of the workforce. This change would, in some circumstances, result in a lower retirement benefit for employees than they currently earn. Additionally, PERS has noted that changes arising from AB 340 could ultimately have an adverse impact on public sector recruitment in areas that have historically experienced recruitment challenges due to higher pay for similar jobs in the private sector.

More information about AB 340 can be accessed through the PERS’s web site at www.calpers.ca.gov. This internet address is provided for reference and convenience only; the information contained within this website may not be current and has not been reviewed by the City and is not incorporated herein by reference.

The City is unable to predict the amount of PERS liabilities in the future or the amount of the PERS contributions which the City may be required to make, all as a result of the implementation of AB 340, and as a result of negotiations with its employee associations.
CONSTITUTIONAL AND STATUTORY LIMITATIONS ON TAXES AND APPROPRIATIONS

The constitutional and statutory provisions discussed in this section have the potential to affect the ability of the City to levy taxes and spend tax proceeds for operating and other purposes.

Article XIII-A of the State Constitution

On June 6, 1978, California voters approved Proposition 13, which added Article XIII-A to the State Constitution. Article XIII-A, as amended, limits the amount of any ad valorem tax on real property to one percent of the full cash value thereof, except that additional ad valorem taxes may be levied to pay debt service (i) on indebtedness approved by the voters prior to July 1, 1978, (ii) on bonded indebtedness approved by a two-thirds vote on or after July 1, 1978, for the acquisition or improvement of real property or (iii) bonded indebtedness incurred by a school district, community college district or county office of education for the construction, reconstruction, rehabilitation or replacement of school facilities, including the furnishing and equipping of school facilities or the acquisition or lease of real property for school facilities, approved by 55 of the voters voting on the proposition. Article XIII-A defines full cash value to mean “the county assessor’s valuation of real property as shown on the 1975-76 tax bill under “full cash value,” or thereafter, the appraised value of real property when purchased, newly constructed, or a change in ownership has occurred after the 1975 assessment.” This full cash value may be increased at a rate not to exceed two percent per year to account for inflation.

Article XIII-A has subsequently been amended to permit reduction of the “full cash value” base in the event of declining property values caused by damage, destruction or other factors, to provide that there would be no increase in the “full cash value” base in the event of reconstruction of property damaged or destroyed in a disaster, and in other minor or technical ways.

Legislation Implementing Article XIII-A

Legislation has been enacted and amended a number of times since 1978 to implement Article XIII-A. Under current law, local agencies are no longer permitted to levy directly any property tax (except to pay voter-approved indebtedness). The 1% property tax is automatically levied by the County and distributed according to a formula among taxing agencies. The formula apportions the tax roughly in proportion to the relative shares of taxes levied prior to 1989.

Increases of assessed valuation resulting from reappraisals of property due to new construction, change in ownership or from the two percent annual adjustment are allocated among the various jurisdictions in the “taxing area” based upon their respective “situs.” Any such allocation made to a local agency continues as part of its allocation in future years.

All taxable property is shown at full market value on the tax rolls. Consequently, the tax rate is expressed as $1 per $100 of taxable value. All taxable property value included in this Official Statement is shown at 100% of market value (unless noted differently) and all tax rates reflect the $1 per $100 of taxable value.

Article XIII-B of the State Constitution
In addition to the limits Article XIII A imposes on property taxes that may be collected by local governments, certain other revenues of the State and most local governments are subject to an annual “appropriations limit” imposed by Article XIII B which effectively limits the amount of such revenues those entities are permitted to spend. Article XIII B, approved by the voters in June 1979, was modified substantially by Proposition 111 in 1990. The appropriations limit of each government entity applies to “proceeds of taxes,” which consist of tax revenues, State subventions and certain other funds, including proceeds from regulatory licenses, user charges or other fees to the extent that such proceeds exceed “the cost reasonably borne by such entity in providing the regulation, product or service.” “Proceeds of taxes” excludes tax refunds and some benefit payments such as unemployment insurance. No limit is imposed on the appropriation of funds which are not “proceeds of taxes,” such as reasonable user charges or fees, and certain other non-tax funds. Article XIII B also does not limit appropriation of local revenues to pay debt service on bonds existing or authorized by January 1, 1979, or subsequently authorized by the voters, appropriations required to comply with mandates of courts or the federal government, appropriations for qualified capital outlay projects, and appropriation by the State of revenues derived from any increase in gasoline taxes and motor vehicle weight fees above January 1, 1990, levels. The appropriations limit may also be exceeded in case of emergency; however, the appropriations limit for the next three years following such emergency appropriation must be reduced to the extent by which it was exceeded, unless the emergency arises from civil disturbance or natural disaster declared by the Governor, and the expenditure is approved by two-thirds of the legislative body of the local government.

The State and each local government entity has its own appropriations limit. Each year, the limit is adjusted to allow for changes, if any, in the cost of living, the population of the jurisdiction, and any transfer to or from another government entity of financial responsibility for providing services. Proposition 111 requires that each agency’s actual appropriations be tested against its limit every two years.

If the aggregate “proceeds of taxes” for the preceding two-year period exceeds the aggregate limit, the excess must be returned to the agency’s taxpayers through tax rate or fee reductions over the following two years. The City has never exceeded its appropriations limit.

**Articles XIII C and XIII D of the State Constitution**

**General.** On November 5, 1996, the voters of the State approved Proposition 218, known as the “Right to Vote on Taxes Act.” Proposition 218 adds Articles XIII C and XIII D to the California Constitution and contains a number of interrelated provisions affecting the ability of the City to levy and collect both existing and future taxes, assessments, fees and charges.

On November 2, 2010, California voters approved Proposition 26, entitled the “Supermajority Vote to Pass New Taxes and Fees Act.” Section 1 of Proposition 26 declares that Proposition 26 is intended to limit the ability of the State Legislature and local government to circumvent existing restrictions on increasing taxes by defining the new or expanded taxes as “fees.” Proposition 26 amended Articles XIII A and XIII C of the State Constitution. The amendments to Article XIII A limit the ability of the State Legislature to impose higher taxes (as defined in Proposition 26) without a two-thirds vote of the Legislature. The amendments to Article XIII C define “taxes” that are subject to voter approval as “any levy, charge, or exaction of any kind imposed by a local government,” with certain exceptions.
**Taxes.** Article XIIIIC requires that all new local taxes be submitted to the electorate before they become effective. Taxes for general governmental purposes of the City (“general taxes”) require a majority vote; taxes for specific purposes (“special taxes”), even if deposited in the City’s General Fund, require a two-thirds vote.

**Property-Related Fees and Charges.** Article XIIIID also adds several provisions making it generally more difficult for local agencies to levy and maintain property-related fees, charges, and assessments for municipal services and programs. These provisions include, among other things, (i) a prohibition against assessments which exceed the reasonable cost of the proportional special benefit conferred on a parcel, (ii) a requirement that assessments must confer a “special benefit,” as defined in Article XIIIID, over and above any general benefits conferred, (iii) a majority protest procedure for assessments which involves the mailing of notice and a ballot to the record owner of each affected parcel, a public hearing and the tabulation of ballots weighted according to the proportional financial obligation of the affected party, and (iv) a prohibition against fees and charges which are used for general governmental services, including police, fire or library services, where the service is available to the public at large in substantially the same manner as it is to property owners.

**Reduction or Repeal of Taxes, Assessments, Fees and Charges.** Article XIIIIC also removes limitations on the initiative power in matters of reducing or repealing local taxes, assessments, fees or charges. No assurance can be given that the voters of the City will not, in the future, approve an initiative or initiatives which reduce or repeal local taxes, assessments, fees or charges currently comprising a substantial part of the City’s general fund. If such repeal or reduction occurs, the City’s ability to pay debt service on the Certificates could be adversely affected.

**Burden of Proof.** Article XIIIIC provides that local government “bears the burden of proving by a preponderance of the evidence that a levy, charge, or other exaction is not a tax, that the amount is no more than necessary to cover the reasonable costs of the governmental activity, and that the manner in which those costs are allocated to a payor bear a fair or reasonable relationship to the payor’s burdens on, or benefits received from, the governmental activity.” Similarly, Article XIIIID provides that in “any legal action contesting the validity of a fee or charge, the burden shall be on the agency to demonstrate compliance” with Article XIIIID.

**Judicial Interpretation of Proposition 218.** The interpretation and application of Articles XIIIIC and XIIIID will ultimately be determined by the courts, and it is not possible at this time to predict with certainty the outcome of such determination.

**Impact on City’s General Fund.** The City does not believe that any material source of General Fund revenue is subject to challenge under Proposition 218 or Proposition 26.

The approval requirements of Articles XIIIIC and XIIIID reduce the flexibility of the City to raise revenues for the General Fund, and no assurance can be given that the City will be able to impose, extend or increase the taxes, fees, charges or taxes in the future that it may need to meet increased expenditure needs.

**Proposition 1A; Proposition 22**

**Proposition 1A.** Proposition 1A, proposed by the Legislature in connection with the State’s Fiscal Year 2004-05 Budget, approved by the voters in November 2004 and generally effective in Fiscal Year 2006-07, provided that the State may not reduce any local sales tax rate,
limit existing local government authority to levy a sales tax rate or change the allocation of local sales tax revenues, subject to certain exceptions. Proposition 1A generally prohibited the State from shifting to schools or community colleges any share of property tax revenues allocated to local governments for any Fiscal Year, as set forth under the laws in effect as of November 3, 2004. Any change in the allocation of property tax revenues among local governments within a county had to be approved by two-thirds of both houses of the Legislature.

**Proposition 22.** Proposition 22, entitled “The Local Taxpayer, Public Safety and Transportation Protection Act,” was approved by the voters of the State in November 2010. Proposition 22 eliminates or reduces the State’s authority to (i) temporarily shift property taxes from cities, counties and special districts to schools, (ii) use vehicle license fee revenues to reimburse local governments for State-mandated costs (the State will have to use other revenues to reimburse local governments), (iii) redirect property tax increment from redevelopment agencies to any other local government, (iv) use State fuel tax revenues to pay debt service on State transportation bonds, or (v) borrow or change the distribution of State fuel tax revenues.

**Possible Future Initiatives**

Articles XIIIA, XIIIB, XIIIC and XIIID and Propositions 62, 111, 218 and 1A were each adopted as measures that qualified for the ballot pursuant to the State’s initiative process. From time to time other initiative measures could be adopted, further affecting revenues of the City or the City’s ability to expend revenues. The nature and impact of these measures cannot be anticipated by the City.
RISK FACTORS

The following factors, along with all other information in this Official Statement, should be considered by potential investors in evaluating the Certificates. The discussion does not purport to be, nor should it be construed to be, complete nor a summary of all factors which may affect the financial condition of the City, the City’s ability to make Lease Payments in the future, or the effectiveness of any remedies that the Trustee may have or circumstances under which Lease Payments may be abated.

No Pledge of Taxes

The Lease Payments and other payments due under the Lease Agreement are not secured by any pledge of taxes or other revenues of the City. See “SECURITY AND SOURCES OF PAYMENT FOR THE CERTIFICATES - Lease Payments.” The Lease Payments are secured by a City covenant to annually budget and appropriate sufficient funds to make Lease Payments from any lawfully available funds, including the general fund. In the event that the City’s general fund revenues are less than its total obligations, the City may choose to pay other costs or expenses before making the Lease Payments.

The obligation of the City to pay the Lease Payments and Additional Rental Payments does not constitute an obligation of the City for which the City is obligated to levy or pledge any form of taxation or for which the City has levied or pledged any form of taxation. The obligation of the City to pay Lease Payments and Additional Rental Payments does not constitute a debt or indebtedness of the Authority, the City, the State of California or any of its political subdivisions within the meaning of any constitutional or statutory debt limitation or restriction.

Although the Lease Agreement does not create a pledge, lien or encumbrance upon the funds of the City, the City is obligated under the Lease Agreement to pay Lease Payments and Additional Rental Payments from any source of legally available funds (subject to certain exceptions) and the City has covenanted in the Lease Agreement that, for as long as the Leased Property is available for its use and possession, it will make the necessary annual appropriations within its budget for all Lease Payments and Additional Rental Payments. See “SECURITY AND SOURCES OF PAYMENT FOR THE CERTIFICATES.”

No Reserve Fund

A reserve fund will not be established with respect to the Certificates. In the event the City fails to make a Lease Payment in full for any reason, including due to an abatement event as described herein, no reserve fund or reserve insurance policy will be available to make up the resulting insufficiency.

Additional Obligations of the City

The City has existing obligations payable from its general fund. See “CITY FINANCIAL INFORMATION – Outstanding General Fund Debt.” In addition, under the Lease Agreement the City is permitted to enter into other obligations which constitute additional charges against its revenues without the consent of owners of the Certificates. To the extent that additional obligations are incurred by the City, the funds available to pay Lease Payments may be decreased.
Limited Recourse on Default

Whenever any event of default referred to in the Lease Agreement happens and continues, the Trustee, as the assignee of the Authority, is authorized under the terms of the Lease Agreement to exercise any and all remedies available under law or granted under the Lease Agreement.

Notwithstanding a default under the Lease Agreement, there is no right under any circumstances to accelerate the Lease Payments or otherwise declare any Lease Payments not then due or past due to be immediately due and payable. Neither the Authority nor the Trustee has any right to re-enter or re-let the Leased Property except following the occurrence and during the continuation of an event of default under the Lease Agreement.

Following an event of default, the Authority may elect either to terminate the Lease Agreement and seek to collect damages from the City or to maintain the Lease Agreement in effect and seek to collect the Lease Payments as they become due. The Lease Agreement further provides that so long as an event of default exists under the Lease Agreement, the Authority, or its assignee, may re-enter the Leased Property for the purpose of taking possession of all or any portion of the Leased Property and to re-let the Leased Property and, in addition, at its option, with or without such entry, to terminate the Lease Agreement as described therein. See “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS OF PRINCIPAL LEGAL DOCUMENTS – The Lease Agreement.”

No assurance can be given that the Trustee will be able to re-let the Leased Property so as to provide rental income sufficient to pay principal and interest evidenced by the Certificates in a timely manner or that such re-letting will not adversely affect the exclusion of interest with respect thereto from gross income for federal or State income tax purposes. Furthermore, it is not certain whether a court would permit the exercise of the remedies of repossession and re-letting with respect to the Leased Property.

In the event of a default, there is no remedy of acceleration of the total Lease Payments due over the term of the Lease Agreement and the Trustee is not empowered to sell the Leased Property and use the proceeds of such sale to prepay the Certificates or pay debt service with respect thereto. The City will be liable only for Lease Payments on an annual basis and, in the event of a default, the Trustee would be required to seek a separate judgment each year for that year’s defaulted Lease Payments. Any such suit for money damages would be subject to limitations on legal remedies against municipalities in California, including a limitation on enforcement of judgments against funds of a fiscal year other than the fiscal year in which the Lease Payments were due and against funds needed to serve the public welfare and interest.

Abatement

The obligation of the City under the Lease Agreement to pay Lease Payments is in consideration of the use and possession of the Leased Property.

Under certain circumstances relating to damage, destruction, condemnation or title defects with respect to the Leased Property which cause a substantial interference with the use and possession of the Leased Property, the City’s obligation to make Lease Payments is subject to full or partial abatement and could result in the Trustee having inadequate funds to pay the principal and interest with respect to the Certificates as and when due. See
“SECURITY AND SOURCES OF PAYMENT FOR THE CERTIFICATES – Abatement” and “APPENDIX A – SUMMARY OF CERTAIN PROVISIONS PRINCIPAL LEGAL DOCUMENTS – The Lease Agreement.” Abatement is not a default under the Lease Agreement and does not result in the Trustee having the right to take any action to avail itself of any remedy against the City.

Property Taxes

**Levy and Collection.** The City does not have any independent power to levy and collect property taxes. Any reduction in the tax rate or the implementation of any constitutional or legislative property tax decrease could reduce the City’s share of local property tax revenues, and accordingly, could have an adverse impact on the ability of the City to make Lease Payments. Likewise, delinquencies in the payment of property taxes could have an adverse effect on the City’s ability to pay principal and interest with respect to the Certificates when due.

**Reduction in Inflationary Rate.** Article XIII A of the California Constitution provides that the full cash value base of real property used in determining assessed value may be adjusted from year to year to reflect the inflationary rate, not to exceed a 2% increase for any given year, or may be reduced to reflect a reduction in the consumer price index or comparable local data. See “CONSTITUTIONAL AND STATUTORY LIMITATIONS ON TAXES AND APPROPRIATIONS.” Such measure is computed on a calendar year basis. Because Article XIII A limits inflationary assessed value adjustments to the lesser of the actual inflationary rate or 2%, there have been years in which the assessed values were adjusted by actual inflationary rates, which were less than 2%. The City is unable to predict if any adjustments to the full cash value base of real property within the City, whether an increase or a reduction, will be realized in the future.

**Appeals of Assessed Values.** There are two types of appeals of assessed values that could adversely impact property tax revenues:

**Proposition 8 Appeals.** Most of the appeals that might be filed in the City would be based on Section 51 of the Revenue and Taxation Code, which requires that for each lien date the value of real property must be the lesser of its base year value annually adjusted by the inflation factor pursuant to Article XIII A of the State Constitution or its full cash value, taking into account reductions in value due to damage, destruction, depreciation, obsolescence, removal of property or other factors causing a decline in value.

Under California law, property owners may apply for a reduction of their property tax assessment by filing a written application, in form prescribed by the State Board of Equalization, with the appropriate county board of equalization or assessment appeals board. In most cases, the appeal is filed because the applicant believes that present market conditions (such as residential home prices) cause the property to be worth less than its current assessed value. These market-driven appeals are known as Proposition 8 appeals.

Any reduction in the assessment ultimately granted as a Proposition 8 appeal applies to the year for which application is made and during which the written application was filed. These reductions are often temporary and are adjusted back to their original values when market conditions improve. Once the property has regained its prior value, adjusted for inflation, it once again is
subject to the annual inflationary factor growth rate allowed under Article XlllA. However, current case law is uncertain as to whether or not property may be adjusted to its prior value at once or if adjustments may only be made subject to the 2% limitation. See “CONSTITUTIONAL AND STATUTORY LIMITATIONS ON TAXES AND APPROPRIATIONS – Article XlllA of the State Constitution.”

Base Year Appeals. A second type of assessment appeal is called a base year appeal, where the property owners challenge the original (basis) value of their property. Appeals for reduction in the "base year" value of an assessment, if successful, reduce the assessment for the year in which the appeal is taken and prospectively thereafter. The base year is determined by the completion date of new construction or the date of change of ownership. Any base year appeal must be made within four years of the change of ownership or new construction date.

No assurance can be given that property tax appeals in the future will not significantly reduce the City’s property tax revenues.

Local Housing Market. Economic downturns, as those that have been experienced in the State and area around the City in the past, can have a negative impact on local property values. High rates of foreclosures tend to depreciate values of homes in the market, which could lead to decreased assessed values and lower property tax revenues to the City. See “–Appeals of Assessed Values” above. Although the City’s total assessed valuation has been increasing in recent years, it is not possible to predict how a future economic downturn could affect home values, assessed values, and receipt of property taxes by the City.

Absence of Earthquake and Flood Insurance

If any portion of the Leased Property is destroyed or rendered useless by a natural hazard such as an earthquake or flood, an abatement could occur and result in the Trustee having inadequate funds to pay the principal and interest represented by the Certificates as and when due. The Lease Agreement does not require the City to obtain earthquake or flood insurance on the Leased Property.

[[All building components of the Public Safety Building, which comprising a portion of the Leased Property, were constructed under the standards of the “Field Act” (California State Building Code, Title 24). The Field Act requires substantially higher construction standards for public schools and hospitals than are required for other types of construction. The Field Act requires that building systems be capable of withstanding seismic forces from the “most credible” earthquake likely to occur in the vicinity of the building system being constructed.]]

Limitations on Remedies; Bankruptcy

The rights of the owners of the Certificates are subject to the limitations on legal remedies against municipalities in the State, including a limitation on enforcement of judgments against funds needed to serve the public welfare and interest. Additionally, enforceability of the rights and remedies of the owners of the Certificates, and enforcement of the City’s obligations under the Lease Agreement, may become subject to the federal bankruptcy code and applicable bankruptcy, insolvency, reorganization, moratorium, or similar laws relating to or affecting the enforcement of creditor’s rights generally, now or hereafter in effect,
principles which may limit the specific enforcement under State law of certain remedies, the exercise by the United States of America of the powers delegated to it by the Constitution, the reasonable and necessary exercise, in certain exceptional situations, of the police powers inherent in the sovereignty of the State and its governmental bodies in the interest of serving a significant and legitimate public purpose and the limitations on remedies against cities in the State.

Bankruptcy proceedings under Chapter 9 of the Bankruptcy Code (Title 11, United States Code), which governs the bankruptcy proceedings for public agencies such as the City, or the exercise of powers by the federal or State government, if initiated, could subject the owners of the Certificates to judicial discretion and interpretation of their rights in bankruptcy or otherwise, and consequently may entail risks of delay, limitation, or modification of their rights. See “— Limited Recourse on Default” above.

Changes in Law

No assurance can be given that the voters in the State or the City will not at some future time adopt initiatives, or that the State Legislature will not adopt legislation that will amend the laws of the State in a manner that could result in a reduction of the City’s revenues and therefore a reduction in the funds legally available to the City to make the Lease Payments, which serve as the security for the Certificates. See, for example, “CONSTITUTIONAL AND STATUTORY LIMITATIONS ON TAXES AND APPROPRIATIONS – Articles XIIIC and XIIID of the State Constitution,” for information about certain risks to the City’s general fund revenues under Articles XIIIC and XIIID of the California Constitution, which were added by Proposition 218.

Natural Disasters

  **General.** The City’s geographic location makes it subject to certain natural disasters, including, but not limited to, earthquakes, landslides, mudslides, flooding/winter storms and tsunamis, that may adversely affect economic activity in the City, and which could have a negative impact on City finances. There can be no assurance that the occurrence of any natural calamity would not cause substantial interference to and costs for the City, and/or reductions in assessed valuations in the City. Additional details on some of these risks to the City are described below.

  **Seismic.** The City is located very close to the San Andreas Fault. As a result, the property in the City is subject to possible structural damage in, and injuries within, the City in the event of an earthquake or other seismic event, including with respect to the Leased Property. The City is not required to maintain earthquake insurance on the Leased Property. See “— Absence of Earthquake and Flood Insurance” above.

  **Landslides.** The area around the City is prone to debris flows (also referred to as mudslides, mudflows or debris avalanches), which are a common type of fast-moving landslide that generally occurs during intense rainfall on previously saturated soil. They commonly start on steep hill-slopes as soil slumps or slides that liquefy, accelerate and flow down hill-slopes and channels onto gently sloping ground. Past storms that triggered damaging debris flows in the San Francisco Bay region, which includes the City, occurred in 1982, 1986 and 1995, causing extensive damage to property.
Flooding/Winter Storms. Winter storms in the State can be cause, among other things, flooding, flash floods, high coastal surf, and mudslides. These events can lead to substantial interference and costs for the City and/or reductions in assessed valuations in the City. For example, during the winter of 2015-16, the City declared a local emergency because of accelerated erosion of cliffs along Esplanade Avenue and Palmetto Avenue in the City. Apartment buildings located at the top of these cliffs were later demolished or scheduled for demolition by the City. Similarly, in 1998, seven homes in the City were demolished after winter storms eroded the cliffsides on which they were located.

Tsunami. A tsunami is a series of sea waves usually caused by displacement of the ocean flood by an undersea earthquake that can produce major coastal damage. Although infrequent, land in the City may be affected by a tsunami, and the City has prepared a map showing approximate “tsunami inundation zone areas,” a tsunami evacuation map and other tsunami-related information for its residents.

LEGAL OPINION

The proceedings in connection with the authorization, sale, execution and delivery of the Certificates are subject to the approval as to their legality of Jones Hall, A Professional Law Corporation, San Francisco, California (“Special Counsel”). A copy of the legal opinion, certified by the official in whose office the original is filed, will be attached to each Certificate, and a form of such opinion is attached as Appendix D. Jones Hall, A Professional Law Corporation, San Francisco, California, is acting as Disclosure Counsel to the City (“Disclosure Counsel”). Schiff Hardin LLP is serving as counsel to the Underwriter (“Underwriter’s Counsel”).

The fees of Special Counsel, Disclosure Counsel, the Trustee, the Escrow Agent, the Underwriter and Underwriter’s Counsel are contingent upon the execution and delivery of the Certificates.

MUNICIPAL ADVISOR

Backstrom McCarley Berry & Co., LLC, San Francisco, California (the “Municipal Advisor”), is acting as the City’s financial advisor in connection with the Certificates. The Municipal Advisor is a registered “Municipal Advisor” with the Securities Exchange Commission and the Municipal Securities Rulemaking Board. The Municipal Advisor is not obligated to undertake, and has not undertaken to make, an independent verification or to assume responsibility for the accuracy, completeness or fairness of the information contained in this Official Statement. The fees of the Municipal Advisor with respect to the Certificates are contingent upon their sale and delivery. The Municipal Advisor is an independent advisory firm and is not engaged in the business of underwriting, trading or distributing municipal or other public securities.

TAX MATTERS

Tax Exemption

Federal Tax Status. In the opinion of Jones Hall, A Professional Law Corporation, San Francisco, California, Special Counsel, subject, however to the qualifications set forth below, under existing law, the portion of the Lease Payments designated as and comprising interest and received by the Owners of the Certificates is excluded from gross income for federal
income tax purposes and such interest is not an item of tax preference for purposes of the federal alternative minimum tax imposed on individuals and corporations, provided, however, that, for the purpose of computing the alternative minimum tax imposed on corporations (as defined for federal income tax purposes), such interest is taken into account in determining certain income and earnings.

The opinions set forth in the preceding paragraph are subject to the condition that the City comply with all requirements of the Internal Revenue Code of 1986, as amended (the "Tax Code") that must be satisfied subsequent to the issuance of the Certificates. The City has covenanted to comply with each such requirement. Failure to comply with certain of such requirements may cause the inclusion of interest with respect to the Certificates in gross income for federal income tax purposes to be retroactive to the date of issuance of the Certificates. Special Counsel expresses no opinion regarding any federal or state tax consequences arising with respect to the Certificates, including any federal tax consequences arising with respect to the ownership, sale or disposition of the Certificates, or the amount, accrual or receipt of interest on the Certificates.

If the initial offering price to the public (excluding bond houses and brokers) at which a Certificate is sold is less than the amount payable at maturity thereof, then such difference constitutes "original issue discount" for purposes of federal income taxes and State of California personal income taxes. If the initial offering price to the public (excluding bond houses and brokers) at which a Certificate is sold is greater than the amount payable at maturity thereof, then such difference constitutes "original issue premium" for purposes of federal income taxes and State of California personal income taxes. De minimis original issue discount and original issue premium is disregarded.

Under the Tax Code, original issue discount is treated as interest excluded from federal gross income and exempt from State of California personal income taxes to the extent properly allocable to each owner thereof subject to the limitations described in the first paragraph of this section. The original issue discount accrues over the term to maturity of the Certificate on the basis of a constant interest rate compounded on each interest or principal payment date (with straight-line interpolations between compounding dates). The amount of original issue discount accruing during each period is added to the adjusted basis of such Certificates to determine taxable gain upon disposition (including sale, prepayment, or payment on maturity) of such Certificate. The Tax Code contains certain provisions relating to the accrual of original issue discount in the case of purchasers of the Certificates who purchase the Certificates after the initial offering of a substantial amount of such maturity. Owners of such Certificates should consult their own tax advisors with respect to the tax consequences of ownership of Certificates with original issue discount, including the treatment of purchasers who do not purchase in the original offering, the allowance of a deduction for any loss on a sale or other disposition, and the treatment of accrued original issue discount on such Certificates under federal individual and corporate alternative minimum taxes.

Under the Tax Code, original issue premium is amortized on an annual basis over the term of the Certificate (said term being the shorter of the Certificate's maturity date or its call date). The amount of original issue premium amortized each year reduces the adjusted basis of the owner of the Certificate for purposes of determining taxable gain or loss upon disposition. The amount of original issue premium on a Certificate is amortized each year over the term to maturity of the Certificate on the basis of a constant interest rate compounded on each interest or principal payment date (with straight-line interpolations between compounding dates). Amortized Certificate premium is not deductible for federal income tax purposes. Owners of
premium Certificates, including purchasers who do not purchase in the original offering, should consult their own tax advisors with respect to State of California personal income tax and federal income tax consequences of owning such Certificates.

**California Tax Status.** In the further opinion of Special Counsel, the portion of the Lease Payments designated as and comprising interest and received by the owners of the Certificates is exempt from California personal income taxes.

**Form of Opinion.** A copy of the proposed form of opinion of Special Counsel is attached hereto as Appendix D.

**Other Tax Considerations**

Owners of the Certificates should also be aware that the ownership or disposition of, or the accrual or receipt of interest on, the Certificates may have federal or state tax consequences other than as described above. Special Counsel expresses no opinion regarding any federal or state tax consequences arising with respect to the Certificates other than as expressly described above, including any federal tax consequences arising with respect to the ownership, sale or disposition of the Certificates, or the amount, accrual or receipt of interest on the Certificates.

Current and future legislative proposals, if enacted into law, clarification of the Tax Code or court decisions may cause interest with respect to the Certificates to be subject, directly or indirectly, to federal income taxation or to be subject to or exempted from state income taxation, or otherwise prevent beneficial owners from realizing the full current benefit of the tax status of such interest. The introduction or enactment of any such legislative proposals, clarification of the Tax Code or court decisions may also affect the market price for, or marketability of, the Certificates. Prospective purchasers of the Certificates should consult their own tax advisors regarding any pending or proposed federal or state tax legislation, regulations or litigation, as to which Special Counsel expresses no opinion.

**NO LITIGATION**

There is no action, suit or proceeding known to be pending, or threatened, restraining or enjoining the execution or delivery of the Certificates, the Trust Agreement, the Lease Agreement, the Site Lease, the Assignment Agreement or any other document relating to the Certificates or in any way contesting or affecting the validity of the foregoing.

There are a number of lawsuits and claims pending against the City which have arisen in the regular course of administering the affairs of the City. In the opinion of the City, such suits and claims as are presently pending will not have a material adverse affect on the ability of the City to make Lease Payments with respect to the Certificates.

**RATING**

S&P Global Ratings ("S&P") has assigned a rating of "AA-" to the Certificates. There is no assurance that the credit rating given to the Certificates will be maintained for any period of time or that the rating may not be lowered or withdrawn entirely by S&P if, in its judgment, circumstances so warrant. Any such downward revision or withdrawal of such rating may have
an adverse effect on the market price of the Certificates. Such rating reflects only the views of S&P and an explanation of the significance of such rating may be obtained from the rating agency.

CONTINUING DISCLOSURE

The City has covenanted, for the benefit of holders and beneficial owners of the Certificates to provide certain financial information and operating data relating to the City to the Municipal Securities Rulemaking Board on an annual basis (an “Annual Report”) not later than nine months after the end of the City’s fiscal year (which currently would be March 31), commencing March 31, 2017, with the report for the 2015-16 Fiscal Year, and to provide notices of the occurrence of certain enumerated events. The first Annual Report filing shall be satisfied with the filing of this Official Statement. The Annual Report and other required notices will be filed by the City with the Municipal Securities Rulemaking Board (the “MSRB”) in the manner prescribed by the Securities Exchange Commission. The specific nature of such information is set forth below under the caption APPENDIX E – “Form of Continuing Disclosure Certificate.” These covenants have been made in order to assist the Underwriter in complying with S.E.C. Rule 15c2-12(b)(5) (the “Rule”).

The City has existing disclosure undertakings that have been made pursuant to the Rule in connection with the issuance of other long-term obligations. See information under the heading “CITY FINANCIAL INFORMATION – Outstanding General Fund Debt.” In addition, the Redevelopment Agency of the City of Pacifica (the “Redevelopment Agency”) was an obligated person in connection with one outstanding series of tax allocation bonds, and the City is the successor agency to the Redevelopment Agency with respect to such undertaking. During the previous five years, specific instances of non-compliance with prior undertakings (which shall not be construed as an acknowledgment that any such non-compliance was material) include:

- late filing of audited financial statements for Fiscal Year 2013-14, and failure to file a notice of late filing in connection therewith;
- late and/or incomplete filings of annual reports containing annual financial and operating information for Fiscal Years 2010-11 through 2014-15; and
- certain notices of underlying rating changes and/or bond insurer rating changes were filed late.

With respect to the foregoing, numerous annual reports were filed without complete information because certain required supplemental information was not included in the filed audits or comprehensive annual reports and a supplemental report was not provided with such filing.

[In order to assist it in complying with its disclosure undertakings for its outstanding bonds and the Certificates, the City has engaged _____________________, a third party dissemination agent, with respect to its each of its disclosure undertakings, including the Continuing Disclosure Certificate to be executed in connection with the Certificates.]

Neither the County nor any other entity other than the City shall have any obligation or incur any liability whatsoever with respect to the performance of the City’s duties regarding continuing disclosure.
UNDERWRITING

The Certificates are being purchased by US Bancorp Investments, Inc., as underwriter (the “Underwriter”). Under a Certificate Purchase Agreement (the “Certificate Purchase Agreement”), the Underwriter has agreed to purchase the Certificates at a purchase price of $________ (which is equal to the principal amount represented by the Certificates, plus/less original issue premium/discount of $________, less an Underwriter’s discount of $______). The Certificate Purchase Agreement provides that the Underwriter will purchase all of the Certificates (if any are purchased), and the Underwriter’s obligation to purchase is subject to certain terms and conditions, including the approval of certain legal matters by counsel.

The Underwriter may offer and sell the Certificates to certain dealers and others at prices lower than the offering prices stated on the inside cover page hereof. The offering prices may be changed by the Underwriter.

The Underwriter has provided the following for inclusion in this Official Statement:

“US Bancorp” is the marketing name of U.S. Bancorp and its subsidiaries, including U.S. Bancorp Investments, Inc., which is serving as the Underwriter of the Certificates, and U.S. Bank National Association, which is serving as Trustee for the Certificates. The Underwriter and its affiliates are full-service financial institutions engaged in various activities, that may include securities trading, commercial and investment banking, municipal advisory, brokerage, and asset management. In the ordinary course of business, the Underwriter and its affiliates may actively trade debt and, if applicable, equity securities (or related derivative securities) and provide financial instruments (which may include bank loans, credit support or interest rate swaps). The Underwriter and its affiliates may engage in transactions for their own accounts involving the securities and instruments made the subject of this securities offering or other offering of the City. The Underwriter and its affiliates may make a market in credit default swaps with respect to municipal securities in the future. The Underwriter and its affiliates may also communicate independent investment recommendations, market color or trading ideas and publish independent research views in respect of the offering of the Certificates or other offerings of the City; provided, however, that potential investors are advised that the offering of the Certificates is made only by means of the Official Statement. No dealer, broker, salesperson or other person has been authorized by the City to give any information or to make any representation other than as contained in the Official Statement.
EXECUTION

The execution and delivery of this Official Statement have been duly authorized by the City and the Authority.

CITY OF PACIFICA

By: __________________________
    City Manager

CITY OF PACIFICA
FINANCING AUTHORITY

By: __________________________
    Treasurer
APPENDIX A

SUMMARY OF CERTAIN PROVISIONS OF PRINCIPAL LEGAL DOCUMENTS

The following is a brief summary of certain provisions of the Site Lease, the Lease Agreement, the Trust Agreement, and the Assignment Agreement. This summary is not intended to be definitive and is qualified in its entirety by reference to such documents for the complete terms thereof. Copies of such documents are available upon request from the City of Pacifica.
APPENDIX B

GENERAL INFORMATION ABOUT
THE CITY OF PACIFICA AND SAN MATEO COUNTY

The following information about the City of Pacifica, (the “City”) and San Mateo County (the “County”) is included only for the purpose of supplying general information regarding the area of the City. The Certificates are not a debt of the City, the County, the State of California (the “State”) or any of its political subdivisions (other than the City), and none of the City, the County, the State or any of its political subdivisions (other than the City) is liable therefor.

General

The City is located in San Mateo County (the “County”) on the California coast approximately 10 miles south of the City of San Francisco. Encompassing approximately 12.6 square miles (of which approximately one third is publicly owned open space), is largely built-out and serves a population of approximately 39,000. The terrain is comprised of a combination of secluded valleys and open hillsides set against a coastline of long beaches and rugged headlands. The geographically distinct portions of Pacifica are linked by Highway 1 and Sharp Park Boulevard. Highway 1 is also the corridor between San Francisco and Half Moon Bay. Sharp Park Boulevard connects to Interstate 280 and also links the City with other portions of the San Francisco peninsula to the east. Due to the City’s close proximity to the Pacific Ocean, it enjoys a moderate climate with temperatures ranging from 50 to 70 degrees.

Municipal Government

The City was incorporated on November 22, 1957 under the general laws of the State of California. The City has a council-manager form of government. There are five Council Members who serve overlapping terms of four years, and the Council, in turn, selects one of the Council Members to serve as Mayor for one year. The legislative body selects a City Manager to administer the affairs of the City. The City provides the following services: public safety (police, fire and civil defense), highways and street, sanitation, health and social services, culture/recreation, public improvements, planning and zoning and general administrative services.

Population

The following table presents population data for both the City and County, as well as the State.

CITY OF PACIFICA, SAN MATEO COUNTY
2012 through 2016 Population Estimates

<table>
<thead>
<tr>
<th>Year</th>
<th>City of Pacifica</th>
<th>San Mateo County</th>
<th>State of California</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>37,551</td>
<td>735,256</td>
<td>37,881,357</td>
</tr>
<tr>
<td>2013</td>
<td>37,516</td>
<td>745,626</td>
<td>38,239,207</td>
</tr>
<tr>
<td>2014</td>
<td>37,594</td>
<td>752,145</td>
<td>38,567,459</td>
</tr>
<tr>
<td>2015</td>
<td>37,685</td>
<td>759,155</td>
<td>38,907,642</td>
</tr>
<tr>
<td>2016</td>
<td>37,806</td>
<td>766,041</td>
<td>39,255,883</td>
</tr>
</tbody>
</table>

Source: California Department of Finance (Demographic Research Unit)
Employment and Industry

The City is included in the San Francisco-Redwood City-South San Francisco Metropolitan District (“MD”), which is comprised of San Francisco and San Mateo Counties. The unemployment rate in the San Francisco-Redwood City-South San Francisco MD was 3.0% in April 2016, unchanged from a revised 3.2% in March 2016, and below the year-ago estimate of 3.4%. This compares with an unadjusted unemployment rate of 5.2% for California and 4.7% for the nation during the same period. The unemployment rate was 3.1% in San Francisco County, and 2.9% in San Mateo County.

The following table summarizes the civilian labor force, employment and unemployment for the San Francisco-Redwood City-South San Francisco MD for the years 2011 through 2015. These figures are county-wide statistics and may not necessarily accurately reflect employment trends in the Counties.

SAN FRANCISCO-REDWOOD CITY-SOUTH SAN FRANCISCO MD
(San Francisco And San Mateo Counties)
Annual Average Civilian Labor Force, Employment and Unemployment, and Unemployment by Industry
Calendar Years 2011 through 2015
(March 2015 Benchmark)

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civilian Labor Force (1)</td>
<td>894,600</td>
<td>922,900</td>
<td>936,700</td>
<td>961,100</td>
<td>990,000</td>
</tr>
<tr>
<td>Employment</td>
<td>824,700</td>
<td>861,900</td>
<td>886,400</td>
<td>919,900</td>
<td>955,000</td>
</tr>
<tr>
<td>Unemployment</td>
<td>69,900</td>
<td>61,000</td>
<td>50,300</td>
<td>41,200</td>
<td>34,900</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>7.8%</td>
<td>6.6%</td>
<td>5.4%</td>
<td>4.3%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Wage and Salary Employment: (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>1,800</td>
<td>1,700</td>
<td>1,800</td>
<td>1,900</td>
<td>1,900</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>34,400</td>
<td>34,000</td>
<td>34,700</td>
<td>35,600</td>
<td>35,700</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>22,300</td>
<td>23,500</td>
<td>24,700</td>
<td>25,600</td>
<td>27,100</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>73,700</td>
<td>75,700</td>
<td>77,500</td>
<td>79,600</td>
<td>81,500</td>
</tr>
<tr>
<td>Trans., Warehousing, Utilities</td>
<td>34,900</td>
<td>36,500</td>
<td>38,700</td>
<td>39,700</td>
<td>40,600</td>
</tr>
<tr>
<td>Information</td>
<td>40,600</td>
<td>46,400</td>
<td>49,600</td>
<td>54,600</td>
<td>59,800</td>
</tr>
<tr>
<td>Financial and Insurance</td>
<td>49,100</td>
<td>49,500</td>
<td>50,300</td>
<td>51,300</td>
<td>53,100</td>
</tr>
<tr>
<td>Real Estate, Rental &amp; Leasing</td>
<td>17,200</td>
<td>18,300</td>
<td>19,300</td>
<td>19,600</td>
<td>20,400</td>
</tr>
<tr>
<td>Professional and Business Services</td>
<td>195,800</td>
<td>214,200</td>
<td>228,000</td>
<td>243,900</td>
<td>261,100</td>
</tr>
<tr>
<td>Educational and Health Services</td>
<td>116,800</td>
<td>120,000</td>
<td>123,400</td>
<td>126,000</td>
<td>129,900</td>
</tr>
<tr>
<td>Leisure and Hospitality</td>
<td>115,000</td>
<td>121,500</td>
<td>125,700</td>
<td>131,100</td>
<td>135,800</td>
</tr>
<tr>
<td>Other Services</td>
<td>34,100</td>
<td>35,800</td>
<td>37,600</td>
<td>39,600</td>
<td>40,100</td>
</tr>
<tr>
<td>Federal Government</td>
<td>18,300</td>
<td>17,900</td>
<td>17,600</td>
<td>17,500</td>
<td>17,700</td>
</tr>
<tr>
<td>State Government</td>
<td>33,700</td>
<td>33,200</td>
<td>32,900</td>
<td>33,000</td>
<td>34,100</td>
</tr>
<tr>
<td>Local Government</td>
<td>68,300</td>
<td>68,400</td>
<td>68,400</td>
<td>70,200</td>
<td>72,600</td>
</tr>
<tr>
<td>Total All Industries (3)</td>
<td>884,400</td>
<td>926,700</td>
<td>962,700</td>
<td>1,005,300</td>
<td>1,053,000</td>
</tr>
</tbody>
</table>

(1) Labor force data is by place of residence; includes self-employed individuals, unpaid family workers, household domestic workers, and workers on strike.
(2) Industry employment is by place of work; excludes self-employed individuals, unpaid family workers, household domestic workers, and workers on strike.
(3) Totals may not add due to rounding.

Source: State of California Employment Development Department.
Major Employers

The following table lists the major employers within the City.

CITY OF PACIFICA
Major Employers
As of June 30, 2015

<table>
<thead>
<tr>
<th>Employer Name</th>
<th># of Employees</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pacifica School District</td>
<td>349</td>
<td>1</td>
</tr>
<tr>
<td>Safeway (2)</td>
<td>227</td>
<td>2</td>
</tr>
<tr>
<td>City of Pacifica</td>
<td>225</td>
<td>3</td>
</tr>
<tr>
<td>Jefferson Union High School District</td>
<td>90</td>
<td>4</td>
</tr>
<tr>
<td>Recology of the Coast</td>
<td>49</td>
<td>5</td>
</tr>
<tr>
<td>Rite Aid (2)</td>
<td>42</td>
<td>6</td>
</tr>
<tr>
<td>Ross Dress for Less</td>
<td>30</td>
<td>7</td>
</tr>
<tr>
<td>North Coast County Water District</td>
<td>20</td>
<td>8</td>
</tr>
</tbody>
</table>


The following table lists the largest employers within the San Mateo County area as of March 2015.

COUNTY OF SAN MATEO
Major Employers
April 2015

<table>
<thead>
<tr>
<th>Employer Name</th>
<th>Business Type</th>
<th>Number of Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genentech Inc.</td>
<td>Biotechnology</td>
<td>9,800</td>
</tr>
<tr>
<td>Oracle Corp</td>
<td>Software</td>
<td>6,750</td>
</tr>
<tr>
<td>County of San Mateo</td>
<td>Government</td>
<td>5,472</td>
</tr>
<tr>
<td>Facebook</td>
<td>Social Networking Website</td>
<td>3,957</td>
</tr>
<tr>
<td>Visa USA/ Visa International</td>
<td>Global Payments Technology</td>
<td>3,500</td>
</tr>
<tr>
<td>Gilead Sciences, Inc.</td>
<td>Biopharmaceuticals</td>
<td>3,115</td>
</tr>
<tr>
<td>Mills-Peninsula Health Services</td>
<td>Health Care</td>
<td>2,500</td>
</tr>
<tr>
<td>San Mateo Cnty Community College Dist.</td>
<td>Education</td>
<td>2,285</td>
</tr>
<tr>
<td>Electronic Arts</td>
<td>Video Gaming</td>
<td>1,550</td>
</tr>
<tr>
<td>Seton Medical Center</td>
<td>Health Care</td>
<td>1,503</td>
</tr>
</tbody>
</table>

Effective Buying Income

“Effective Buying Income” is defined as personal income less personal tax and non-tax payments, a number often referred to as “disposable” or “after-tax” income. Personal income is the aggregate of wages and salaries, other labor-related income (such as employer contributions to private pension funds), proprietor's income, rental income (which includes imputed rental income of owner-occupants of non-farm dwellings), dividends paid by corporations, interest income from all sources, and transfer payments (such as pensions and welfare assistance). Deducted from this total are personal taxes (federal, state and local), non-tax payments (fines, fees, penalties, etc.) and personal contributions to social insurance. According to U.S. government definitions, the resultant figure is commonly known as “disposable personal income.”

The following table summarizes the total effective buying income for the City, the County, the State and the United States from 2011 through 2015.

**CITY OF PACIFICA AND COUNTY OF SAN MATEO**

**Effective Buying Income**

**For Calendar Years 2011 Through 2015**

<table>
<thead>
<tr>
<th>Year</th>
<th>Area</th>
<th>Total Effective Buying Income (000's Omitted)</th>
<th>Median Household Effective Buying Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>City of Pacifica</td>
<td>$1,127,190</td>
<td>$68,081</td>
</tr>
<tr>
<td></td>
<td>San Mateo County</td>
<td>23,717,578</td>
<td>66,434</td>
</tr>
<tr>
<td></td>
<td>California</td>
<td>814,578,458</td>
<td>47,062</td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>6,438,704,664</td>
<td>41,253</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>City of Pacifica</td>
<td>$1,247,970</td>
<td>$69,621</td>
</tr>
<tr>
<td></td>
<td>San Mateo County</td>
<td>26,570,648</td>
<td>68,429</td>
</tr>
<tr>
<td></td>
<td>California</td>
<td>864,088,828</td>
<td>47,307</td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>6,737,867,730</td>
<td>41,358</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>City of Pacifica</td>
<td>$1,345,383</td>
<td>$74,622</td>
</tr>
<tr>
<td></td>
<td>San Mateo County</td>
<td>26,846,688</td>
<td>70,427</td>
</tr>
<tr>
<td></td>
<td>California</td>
<td>858,676,636</td>
<td>48,340</td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>6,982,757,379</td>
<td>43,715</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>City of Pacifica</td>
<td>$1,428,550</td>
<td>$78,253</td>
</tr>
<tr>
<td></td>
<td>San Mateo County</td>
<td>28,257,708</td>
<td>72,165</td>
</tr>
<tr>
<td></td>
<td>California</td>
<td>901,189,699</td>
<td>50,072</td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>7,357,153,421</td>
<td>45,448</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>City of Pacifica</td>
<td>$1,428,550</td>
<td>78,253</td>
</tr>
<tr>
<td></td>
<td>San Mateo County</td>
<td>28,257,708</td>
<td>72,165</td>
</tr>
<tr>
<td></td>
<td>California</td>
<td>901,189,699</td>
<td>50,072</td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>7,357,153,421</td>
<td>45,448</td>
</tr>
</tbody>
</table>

Source: The Nielsen Company (US), Inc.
Commercial Activity

Summaries of historic taxable sales within the City and the County during the past five years in which data is available are shown in the following tables. Annual figures are not yet available for calendar years 2014 or 2015.

Total taxable sales during the first three quarters of calendar year 2014 in the City were reported to be $131,993,000, a 1.13% increase from the total taxable sales of $130,522,000 reported during the first three quarters of calendar year 2013. More recent data is not available.

CITY OF PACIFICA
TAXABLE TRANSACTIONS
For Calendar Years 2009 Through 2013
(Dollars in thousands)

<table>
<thead>
<tr>
<th></th>
<th>Number of Permits as of July 1</th>
<th>Taxable Transactions</th>
<th>Number of Permits as of July 1</th>
<th>Taxable Transactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail Stores</td>
<td></td>
<td></td>
<td>Total All Outlets</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>471</td>
<td>$126,911</td>
<td>722</td>
<td>$138,338</td>
</tr>
<tr>
<td>2010</td>
<td>473</td>
<td>134,598</td>
<td>727</td>
<td>147,574</td>
</tr>
<tr>
<td>2011</td>
<td>491</td>
<td>147,672</td>
<td>740</td>
<td>157,079</td>
</tr>
<tr>
<td>2012</td>
<td>485</td>
<td>155,244</td>
<td>726</td>
<td>164,804</td>
</tr>
<tr>
<td>2013</td>
<td>515</td>
<td>166,108</td>
<td>739</td>
<td>175,372</td>
</tr>
</tbody>
</table>

Source: California State Board of Equalization, Taxable Sales in California (Sales & Use Tax).

Total taxable sales during the first three quarters of calendar year 2014 in the County were reported to be $11,117,573,000, a 5.67% increase from the total taxable sales of $10,520,953 reported during the first three quarters of calendar year 2013.

COUNTY OF SAN MATEO
TAXABLE TRANSACTIONS
For Calendar Years 2009 Through 2013
(Dollars in thousands)

<table>
<thead>
<tr>
<th></th>
<th>Number of Permits</th>
<th>Taxable Transactions</th>
<th>Number of Permits</th>
<th>Taxable Transactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail Stores</td>
<td></td>
<td></td>
<td>Total All Outlets</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>11,143</td>
<td>$7,455,767</td>
<td>18,840</td>
<td>$11,327,022</td>
</tr>
<tr>
<td>2010</td>
<td>11,340</td>
<td>7,846,274</td>
<td>18,979</td>
<td>11,966,338</td>
</tr>
<tr>
<td>2011</td>
<td>11,470</td>
<td>8,536,043</td>
<td>18,995</td>
<td>13,020,643</td>
</tr>
<tr>
<td>2012</td>
<td>11,748</td>
<td>9,277,144</td>
<td>19,189</td>
<td>13,906,978</td>
</tr>
<tr>
<td>2013</td>
<td>12,438</td>
<td>9,935,641</td>
<td>19,808</td>
<td>14,611,618</td>
</tr>
</tbody>
</table>

Source: State Board of Equalization.
Construction Activity

The following tables provide a summary of residential building permit valuations and nonresidential building permit valuations, and the total number of all building permit valuations in the City and the County during the past five years. Annual figures are not yet available for calendar year 2016.

**CITY OF PACIFICA**

**Building Permit Valuation**

(Valuation in Thousands of Dollars)

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Single-family</td>
<td>$483.6</td>
<td>$1,909.4</td>
<td>$2,157.0</td>
<td>$1,010.3</td>
<td>$277.5</td>
</tr>
<tr>
<td>New Multi-family</td>
<td>722.4</td>
<td>0.0</td>
<td>722.4</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Res. Alterations/Additions</td>
<td>4,649.9</td>
<td>2,282.0</td>
<td>1,689.5</td>
<td>3,340.1</td>
<td>2,943.2</td>
</tr>
<tr>
<td>Total Residential</td>
<td>$5855.9</td>
<td>$4191.4</td>
<td>$4568.9</td>
<td>$4,350.4</td>
<td>$3,220.7</td>
</tr>
<tr>
<td>New Commercial</td>
<td>$0.0</td>
<td>$228.0</td>
<td>$512.0</td>
<td>$2.5</td>
<td>$0.0</td>
</tr>
<tr>
<td>New Industrial</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>New Other</td>
<td>0.0</td>
<td>92.2</td>
<td>213.0</td>
<td>3,255.0</td>
<td>727.5</td>
</tr>
<tr>
<td>Com. Alterations/Additions</td>
<td>622.1</td>
<td>261.0</td>
<td>10.0</td>
<td>31.0</td>
<td>706.9</td>
</tr>
<tr>
<td>Total Nonresidential</td>
<td>$622.1</td>
<td>$581.2</td>
<td>$735.0</td>
<td>$3288.5</td>
<td>$1,434.4</td>
</tr>
</tbody>
</table>

**New Dwelling Units**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Family</td>
<td>1</td>
</tr>
<tr>
<td>Multiple Family</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3</td>
</tr>
</tbody>
</table>

*Source: Construction Industry Research Board, Building Permit Summary.*

**COUNTY OF SAN MATEO**

**Building Permit Valuation**

(Valuation in Thousands of Dollars)

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Single-family</td>
<td>$194,950.1</td>
<td>$245,163.9</td>
<td>$292,893.4</td>
<td>$289,903.2</td>
<td>$374,275.5</td>
</tr>
<tr>
<td>New Multi-family</td>
<td>107,040.0</td>
<td>171,390.4</td>
<td>151,019.5</td>
<td>162,925.6</td>
<td>259,181.0</td>
</tr>
<tr>
<td>Res. Alterations/Additions</td>
<td>289,619.5</td>
<td>201,543.1</td>
<td>299,830.5</td>
<td>348,231.2</td>
<td>408,011.2</td>
</tr>
<tr>
<td>Total Residential</td>
<td>$591,609.6</td>
<td>$618,097.4</td>
<td>$743,743.4</td>
<td>$801,060.0</td>
<td>$1,041,467.7</td>
</tr>
<tr>
<td>New Commercial</td>
<td>$28,247.6</td>
<td>$83,374.0</td>
<td>$165,578.7</td>
<td>$413,462.8</td>
<td>$328,133.6</td>
</tr>
<tr>
<td>New Industrial</td>
<td>3,359.4</td>
<td>2,021.6</td>
<td>15,724.2</td>
<td>9,600.0</td>
<td>0.0</td>
</tr>
<tr>
<td>New Other</td>
<td>26,029.4</td>
<td>1,975.6</td>
<td>58,726.5</td>
<td>103,363.4</td>
<td>192,961.9</td>
</tr>
<tr>
<td>Com. Alterations/Additions</td>
<td>244,089.0</td>
<td>167,438.8</td>
<td>263,460.8</td>
<td>490,364.6</td>
<td>489,389.7</td>
</tr>
<tr>
<td>Total Nonresidential</td>
<td>$301,725.4</td>
<td>$254,810.0</td>
<td>$503,490.2</td>
<td>$1,016,790.8</td>
<td>$1,010,485.2</td>
</tr>
</tbody>
</table>

**New Dwelling Units**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Family</td>
<td>213</td>
</tr>
<tr>
<td>Multiple Family</td>
<td>545</td>
</tr>
<tr>
<td>TOTAL</td>
<td>758</td>
</tr>
</tbody>
</table>

*Source: Construction Industry Research Board, Building Permit Summary.*
APPENDIX C

AUDITED FINANCIAL STATEMENTS OF THE CITY
FOR FISCAL YEAR ENDED JUNE 30, 2015
APPENDIX D

FORM OF LEGAL OPINION

___________, 2016

City Council
City of Pacifica
170 Santa Maria Avenue
Pacifica, California 94044

OPINION: $___________ 2016 Refunding Certificates of Participation Evidencing the Direct, Undivided Fractional Interests of the Owners Thereof in Lease Payments to be Made by the City of Pacifica, California as the Rental for Certain Property Under a Lease Agreement with the City of Pacifica Financing Authority

Members of the City Council:

We have acted as special counsel to the City of Pacifica (the “City”) in connection with the delivery by the City of a Lease Agreement dated as of October 1, 2016 (the “Lease Agreement”), between the City of Pacifica Financing Authority (the “Authority”) as lessor and the City as lessee. Under a Trust Agreement dated as of October 1, 2016 (the “Trust Agreement”), among the City, the Authority and U.S. Bank National Association, as trustee thereunder (the “Trustee”), the Trustee has executed and delivered $___________ aggregate principal amount of 2016 Refunding Certificates of Participation (the “Certificates”) evidencing the direct, undivided fractional interests of the owners thereof in lease payments to be made by the City under the Lease Agreement (the “Lease Payments”), which have been assigned by the Authority to the Trustee under an Assignment Agreement dated as of October 1, 2016 (the “Assignment Agreement”) between the Authority and the Trustee. We have examined the law and such certified proceedings and other papers as we deem necessary to render this opinion.

As to questions of fact material to our opinion, we have relied upon representations of the City and the Authority contained in the Lease Agreement and the Trust Agreement, and in certified proceedings and other certifications of public officials and others furnished to us, without undertaking to verify the same by independent investigation.

Based upon the foregoing, we are of the opinion, under existing law, as follows:

1. The City is duly created and validly existing as a municipal corporation and general law city under the Constitution and laws of the State of California with the full power to enter into the Lease Agreement and the Trust Agreement and to perform the agreements on its part contained therein.
2. The Lease Agreement and the Trust Agreement have been duly approved by the City and constitute valid and binding obligations of the City enforceable against the City in accordance with their respective terms.

3. The Certificates have been validly executed and delivered by the Trustee under the Trust Agreement and, by virtue of the assignment made under the Assignment Agreement, the owners of the Certificates are entitled to the benefits of the Lease Agreement.

4. The portion of the Lease Payments designated as and comprising interest and received by the owners of the Certificates is excluded from gross income for federal income tax purposes and is not an item of tax preference for purposes of the federal alternative minimum tax imposed on individuals and corporations; it should be noted, however, that for the purpose of computing the alternative minimum tax imposed on such corporations (as defined for federal income tax purposes), such interest is required to be taken into account in determining certain income and earnings. The opinions set forth in the preceding sentence are subject to the condition that the City comply with all requirements of the Internal Revenue Code of 1986, as amended, that must be satisfied subsequent to the delivery of the Lease Agreement in order that such interest be, or continue to be, excluded from gross income for federal income tax purposes. The City has covenanted in the Lease Agreement and the Trust Agreement and other instruments relating to the Certificates to comply with each of such requirements. Failure to comply with certain of such requirements may cause the inclusion of such interest in gross income for federal income tax purposes to be retroactive to the date of delivery of the Lease Agreement. We express no opinion regarding other federal tax consequences arising with respect to the Lease Agreement and the Certificates, or the amount, accrual or receipt of interest represented by the Certificates.

5. The portion of the Lease Payments designated as and comprising interest and received by the owners of the Certificates is exempt from personal income taxation imposed by the State of California.

The rights of the owners of the Certificates and the enforceability of the Lease Agreement, the Trust Agreement and the Assignment Agreement may be subject to bankruptcy, insolvency, reorganization, moratorium and other similar laws affecting creditors' rights heretofore or hereafter enacted and may also be subject to the exercise of judicial discretion in accordance with principles of equity or otherwise in appropriate cases.

Respectfully submitted,

A Professional Law Corporation
APPENDIX E

FORM OF CONTINUING DISCLOSURE CERTIFICATE

$_______

2016 REFUNDING CERTIFICATES OF PARTICIPATION
Evidencing the Direct, Undivided Fractional Interests of the
Owners Thereof in Lease Payments to be Made by the
CITY OF PACIFICA
to City of Pacifica Financing Authority
(2008 Certificates Refinancing)

CONTINUING DISCLOSURE CERTIFICATE

This Continuing Disclosure Certificate (this “Disclosure Certificate”) is dated _______, 2016 and is executed and delivered by the City of Pacifica (the “City”) in connection with the execution and delivery of the captioned refunding certificate of participation (the “Certificates”). The Certificates are being executed and delivered pursuant to a Trust Agreement, dated as of October 1, 2016 (the “Trust Agreement”), among the City, the City of Pacifica Financing Authority and U.S. Bank National Association as trustee for the Certificates (the “Trustee”).

The City hereby covenants and agrees as follows:

Section 1. Purpose of the Disclosure Certificate. This Disclosure Certificate is being executed and delivered by the City for the benefit of the holders and beneficial owners of the Certificates and in order to assist the Participating Underwriter in complying with S.E.C. Rule 15c2-12(b)(5).

Section 2. Definitions. In addition to the definitions set forth above and in the Trust Agreement, which apply to any capitalized term used in this Disclosure Certificate unless otherwise defined in this Section 2, the following capitalized terms have the following meanings:

“Annual Report” means any Annual Report provided by the City under and as described in Sections 3 and 4.

“Annual Report Date” means the date not later than nine months after the end of each fiscal year of the City (currently June 30th), commencing March 31, 2017.

“Dissemination Agent” means the City or a Dissemination Agent designated in writing by the City and which has filed with the City a written acceptance of such designation.

“Listed Events” means any of the events listed in Section 5(a).

“MSRB” means the Municipal Securities Rulemaking Board, which has been designated by the Securities and Exchange Commission as the sole repository of disclosure information for purposes of the Rule.

“Official Statement” means the final official statement executed by the City in connection with the issuance of the Certificates.
“Participating Underwriter” means RBC Capital Markets, LLC, the original underwriter of the Certificates required to comply with the Rule in connection with offering of the Certificates.

“Rule” means Rule 15c2-12(b)(5) adopted by the Securities and Exchange Commission under the Securities Exchange Act of 1934, as the same may be amended from time to time.

“Trustee” means U.S. Bank National Association, or any successor thereto.

Section 3. Provision of Annual Reports.

(a) The City shall, or shall cause the Dissemination Agent to, not later than the Annual Report Date, commencing not later than March 31, 2017 with the report for the 2015-16 fiscal year, provide to the MSRB in an electronic format as prescribed by the MSRB, an Annual Report that is consistent with the requirements of Section 4. The initial Annual Report shall be deemed to be satisfied by the filing of the Official Statement. Not later than 15 Business Days prior to the Annual Report Date, the City shall provide the Annual Report to the Dissemination Agent (if other than the City). If by 15 Business Days prior to the Annual Report Date the Dissemination Agent (if other than the City) has not received a copy of the Annual Report, the Dissemination Agent shall contact the City to determine if the City is in compliance with the previous sentence. The Annual Report may be submitted as a single document or as separate documents comprising a package, and may include by reference other information as provided in Section 4; provided that the audited financial statements of the City may be submitted separately from the balance of the Annual Report, and later than the Annual Report Date, if not available by that date. The filing of the Official Statement for the Certificates shall satisfy the filing of the initial Annual Report. If the City’s fiscal year changes, it shall give notice of such change in the same manner as for a Listed Event under Section 5(c). The City shall provide a written certification with each Annual Report furnished to the Dissemination Agent to the effect that such Annual Report constitutes the Annual Report required to be furnished by the City hereunder.

(b) If the City does not provide (or cause the Dissemination Agent to provide) an Annual Report by the Annual Report Date, the City shall provide (or cause the Dissemination Agent to provide) in a timely manner to the MSRB, in an electronic format as prescribed by the MSRB, a notice in substantially the form attached as Exhibit A, with a copy to the Participating Underwriter.

(c) With respect to each Annual Report, the Dissemination Agent shall:

(i) determine each year prior to the Annual Report Date the then-applicable rules and electronic format prescribed by the MSRB for the filing of annual continuing disclosure reports; and

(ii) if the Dissemination Agent is other than the City, file a report with the City certifying that the Annual Report has been provided under this Disclosure Certificate, and stating the date it was provided.
Section 4. Content of Annual Reports. The City’s Annual Report shall contain or incorporate by reference the following:

(a) Audited financial statements prepared in accordance with generally accepted accounting principles as promulgated to apply to governmental entities from time to time by the Governmental Accounting Standards Board. If the City’s audited financial statements are not available by the Annual Report Date, the Annual Report shall contain unaudited financial statements in a format similar to the financial statements contained in the final Official Statement, and the audited financial statements shall be filed in the same manner as the Annual Report when they become available.

(b) To the extent not contained in the audited financial statements filed on or before the Annual Report Date, the following information shall be included in the Annual Report:

(i) the most recently adopted budget showing budgeted figures, which is available at the time of filing the Annual Report;

(ii) pension plan contributions for the most recently completed fiscal year;

(iv) a summary of the outstanding principal amounts of short-term borrowings, lease obligations and other long-term borrowings of the City for the most recently completed fiscal year;

(v) assessed valuation of taxable properties in the City for the most recently completed fiscal year;

(vi) assessed valuation of properties of the top twenty taxpayers for the most recently completed fiscal year;

(vii) if the City is not participating in the County’s Teeter Plan, property tax collection delinquencies for the City for the most recently completed fiscal year or if not available at the time of the filing of the Annual Report for the prior fiscal year, if available from the County; and

(viii) such further information, if any, as may be necessary to make the specifically required statements, in the light of the circumstances under which they are made, not misleading.

(c) Any or all of the items listed above may be included by specific reference to other documents, including official statements of debt issues of the City or related public entities, which are available to the public on the MSRB’s internet web site or filed with the Securities and Exchange Commission. The City shall clearly identify each such other document so included by reference.

Section 5. Reporting of Significant Events.

(a) The City shall give, or cause to be given, notice of the occurrence of any of the following Listed Events with respect to the Certificates:
1. Principal and interest payment delinquencies.
2. Non-payment related defaults, if material.
3. Unscheduled draws on debt service reserves reflecting financial difficulties.
4. Unscheduled draws on credit enhancements reflecting financial difficulties.
5. Substitution of credit or liquidity providers, or their failure to perform.
6. Adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the security, or other material events affecting the tax status of the security.
7. Modifications to rights of security holders, if material.
8. Bond calls, if material, and tender offers.
10. Release, substitution, or sale of property securing repayment of the securities, if material.
11. Rating changes.
12. Bankruptcy, insolvency, receivership or similar event of the City.
13. The consummation of a merger, consolidation, or acquisition involving the City or the sale of all or substantially all of the assets of the City, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material.
14. Appointment of a successor or additional Member or the change of name of a Member, if material.

(b) Whenever the City obtains knowledge of the occurrence of a Listed Event, the City shall, or shall cause the Dissemination Agent (if not the City) to, file a notice of such occurrence with the MSRB, in an electronic format as prescribed by the MSRB, in a timely manner not in excess of 10 business days after the occurrence of the Listed Event. Notwithstanding the foregoing, notice of Listed Events described in subsections (a)(8) and (9) above need not be given under this subsection any earlier than the notice (if any) of the underlying event is given to holders of affected Certificates under the Trust Agreement.

(c) The City acknowledges that the events described in subparagraphs (a)(2), (a)(7), (a)(8) (if the event is a bond call), (a)(10), (a)(13), and (a)(14) of this Section 5 contain the qualifier “if material” and that subparagraph (a)(6) also contains the qualifier “material” with respect to certain notices, determinations or other events affecting the tax status of the Lease Payments relating to the Certificates. The City shall cause a notice to be filed as set forth in paragraph (b) above with respect to any such event only to the extent that it determines the event’s occurrence is material for purposes of U.S. federal securities law. Whenever the City obtains knowledge of the occurrence of any of these Listed Events, the City will as soon as
possible determine if such event would be material under applicable federal securities law. If such event is determined to be material, the City will cause a notice to be filed as set forth in paragraph (b) above.

(d) For purposes of this Disclosure Certificate, any event described in paragraph (a)(12) above is considered to occur when any of the following occur: the appointment of a receiver, fiscal agent, or similar officer for the City in a proceeding under the United States Bankruptcy Code or in any other proceeding under state or federal law in which a court or governmental authority has assumed jurisdiction over substantially all of the assets or business of the City, or if such jurisdiction has been assumed by leaving the existing governing body and officials or officers in possession but subject to the supervision and orders of a court or governmental authority, or the entry of an order confirming a plan of reorganization, arrangement, or liquidation by a court or governmental authority having supervision or jurisdiction over substantially all of the assets or business of the City.

Section 6. Identifying Information for Filings with the MSRB. All documents provided to the MSRB under the Disclosure Certificate shall be accompanied by identifying information as prescribed by the MSRB.

Section 7. Termination of Reporting Obligation. The City’s obligations under this Disclosure Certificate shall terminate upon the legal defeasance, prior prepayment or payment in full of all of the Certificates. If such termination occurs prior to the final maturity of the Certificates, the City shall give notice of such termination in the same manner as for a Listed Event under Section 5(c).

Section 8. Dissemination Agent. The City may, from time to time, appoint or engage a Dissemination Agent to assist it in carrying out its obligations under this Disclosure Certificate, and may discharge any Dissemination Agent, with or without appointing a successor Dissemination Agent. Any Dissemination Agent may resign by providing 30 days’ written notice to the City. The initial Dissemination Agent shall be _________.

Section 9. Amendment; Waiver. Notwithstanding any other provision of this Disclosure Certificate, the City may amend this Disclosure Certificate, and any provision of this Disclosure Certificate may be waived, provided that the following conditions are satisfied:

(a) if the amendment or waiver relates to the provisions of Sections 3(a), 4 or 5(a), it may only be made in connection with a change in circumstances that arises from a change in legal requirements, change in law, or change in the identity, nature, or status of an obligated person with respect to the Certificates, or type of business conducted;

(b) the undertakings herein, as proposed to be amended or waived, would, in the opinion of nationally recognized bond counsel, have complied with the requirements of the Rule at the time of the primary offering of the Certificates, after taking into account any amendments or interpretations of the Rule, as well as any change in circumstances; and

(c) the proposed amendment or waiver either (i) is approved by holders of the Certificates in the manner provided in the Trust
Agreement for amendments to the Trust Agreement with the consent of holders, or (ii) does not, in the opinion of nationally recognized bond counsel, materially impair the interests of the holders or beneficial owners of the Certificates.

If the annual financial information or operating data to be provided in the Annual Report is amended pursuant to the provisions hereof, the first annual financial information filed pursuant hereto containing the amended operating data or financial information shall explain, in narrative form, the reasons for the amendment and the impact of the change in the type of operating data or financial information being provided.

If an amendment is made to the undertaking specifying the accounting principles to be followed in preparing financial statements, the annual financial information for the year in which the change is made shall present a comparison between the financial statements or information prepared on the basis of the new accounting principles and those prepared on the basis of the former accounting principles. The comparison shall include a qualitative discussion of the differences in the accounting principles and the impact of the change in the accounting principles on the presentation of the financial information, in order to provide information to investors to enable them to evaluate the ability of the City to meet its obligations. To the extent reasonably feasible, the comparison shall be quantitative. A notice of the change in the accounting principles shall be filed in the same manner as for a Listed Event under Section 5(c).

Section 10. Additional Information. Nothing in this Disclosure Certificate shall be deemed to prevent the City from disseminating any other information, using the means of dissemination set forth in this Disclosure Certificate or any other means of communication, or including any other information in any Annual Report or notice of occurrence of a Listed Event, in addition to that which is required by this Disclosure Certificate. If the City chooses to include any information in any Annual Report or notice of occurrence of a Listed Event in addition to that which is specifically required by this Disclosure Certificate, the City shall have no obligation under this Disclosure Certificate to update such information or include it in any future Annual Report or notice of occurrence of a Listed Event.

Section 11. Default. If the City fails to comply with any provision of this Disclosure Certificate, the Participating Underwriter or any holder or beneficial owner of the Certificates may take such actions as may be necessary and appropriate, including seeking mandate or specific performance by court order, to cause the City to comply with its obligations under this Disclosure Certificate. A default under this Disclosure Certificate shall not be deemed an Event of Default under the Trust Agreement, and the sole remedy under this Disclosure Certificate in the event of any failure of the City to comply with this Disclosure Certificate shall be an action to compel performance.
Section 12. Duties, Immunities and Liabilities of Dissemination Agent.

(a) The Dissemination Agent shall have only such duties as are specifically set forth in this Disclosure Certificate, and the City agrees to indemnify and save the Dissemination Agent, its officers, directors, employees and agents, harmless against any loss, expense and liabilities which they may incur arising out of or in the exercise or performance of its powers and duties hereunder, including the costs and expenses (including attorneys fees) of defending against any claim of liability, but excluding liabilities due to the Dissemination Agent’s negligence or willful misconduct. The Dissemination Agent will have no duty or obligation to review any information provided to it by the City hereunder, and shall not be deemed to be acting in any fiduciary capacity for the City, the Certificate holders or any other party. The obligations of the City under this Section shall survive resignation or removal of the Dissemination Agent and payment of the Certificates.

(b) The Dissemination Agent shall be paid compensation by the City for its services provided hereunder in accordance with its schedule of fees as amended from time to time, and shall be reimbursed for all expenses, legal fees and advances made or incurred by the Dissemination Agent in the performance of its duties hereunder.

Section 13. Beneficiaries. This Disclosure Certificate shall inure solely to the benefit of the City, the Dissemination Agent, the Participating Underwriter and holders and beneficial owners from time to time of the Certificates, and shall create no rights in any other person or entity.

Date: ________, 2016

CITY OF PACIFICA

By: ____________________________________________
Name: __________________________________________
Title: __________________________________________
EXHIBIT A

NOTICE OF FAILURE TO FILE ANNUAL REPORT

Name of Issuer: City of Pacifica (the “City”)

Name of Issue: $_________ City of Pacifica 2016 Refunding Certificates of Participation

Date of Issuance: __________, 2016

NOTICE IS HEREBY GIVEN that the City has not provided an Annual Report with respect to the above-named Certificates of Participation as required by the Continuing Disclosure Certificate executed by the City in connection with the execution and delivery of the Certificates captioned above. The City anticipates that the Annual Report will be filed by ____________.

Dated: ______

CITY OF PACIFICA

By: ___________________________

Its: ___________________________
APPENDIX F

BOOK-ENTRY ONLY SYSTEM

The following description of the Depository Trust Company ("DTC"), the procedures and record keeping with respect to beneficial ownership interests in the Certificates, payment of principal, interest and other payments on the Certificates to DTC Participants or Beneficial Owners, confirmation and transfer of beneficial ownership interest in the Certificates and other related transactions between DTC, the DTC Participants and the Beneficial Owners is based solely on information provided by DTC. Accordingly, no representations can be made concerning these matters and neither the DTC Participants nor the Beneficial Owners should rely on the foregoing information with respect to such matters, but should instead confirm the same with DTC or the DTC Participants, as the case may be.

Neither the City nor the Underwriter take any responsibility for the information contained in this Section.

No assurances can be given that DTC, DTC Participants or Indirect Participants will distribute to the Beneficial Owners (a) payments of interest, principal or premium, if any, with respect to the Certificates, (b) Certificates representing ownership interest in or other confirmation or ownership interest in the Certificates, or (c) prepayment or other notices sent to DTC or Cede & Co., its nominee, as the registered owner of the Certificates, or that they will so do on a timely basis, or that DTC, DTC Participants or DTC Indirect Participants will act in the manner described in this Appendix. The current "Rules" applicable to DTC are on file with the Securities and Exchange Commission and the current "Procedures" of DTC to be followed in dealing with DTC Participants are on file with DTC.

1. The Depository Trust Company ("DTC"), New York, NY, will act as securities depository for the securities (in this Appendix, the "Certificates"). The Certificates will be issued as fully-registered securities registered in the name of Cede & Co. (DTC’s partnership nominee) or such other name as may be requested by an authorized representative of DTC. One fully-registered Certificate will be issued for each maturity of each series of the Certificates, in the aggregate principal amount of such maturity, and will be deposited with DTC. If, however, the aggregate principal amount of any maturity exceeds $500 million, one certificate will be issued with respect to each $500 million of principal amount and an additional certificate will be issued with respect to any remaining principal amount of such issue.

2. DTC, the world’s largest securities depository, is a limited-purpose trust company organized under the New York Banking Law, a “banking organization” within the meaning of the New York Banking Law, a member of the Federal Reserve System, a “clearing corporation” within the meaning of the New York Uniform Commercial Code, and a “clearing agency” registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934. DTC holds and provides asset servicing for over 3.5 million issues of U.S. and non-U.S. equity issues, corporate and municipal debt issues, and money market instruments (from over 100 countries) that DTC’s participants (“Direct Participants”) deposit with DTC. DTC also facilitates the post-trade settlement among Direct Participants of sales and other securities transactions in deposited securities, through electronic computerized book-entry transfers and pledges between Direct Participants’ accounts. This eliminates the need for physical movement of securities certificates. Direct Participants include both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, clearing corporations, and certain other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation (“DTCC”). DTCC is
the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others such as both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, and clearing corporations that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly (“Indirect Participants”). DTC has a Standard & Poor’s rating of AA+. The DTC Rules applicable to its Participants are on file with the Securities and Exchange Commission. More information about DTC can be found at www.dtcc.com. The information contained on this Internet site is not incorporated herein by reference.

3. Purchases of Certificates under the DTC system must be made by or through Direct Participants, which will receive a credit for the Certificates on DTC’s records. The ownership interest of each actual purchaser of each Certificate (“Beneficial Owner”) is in turn to be recorded on the Direct and Indirect Participants’ records. Beneficial Owners will not receive written confirmation from DTC of their purchase. Beneficial Owners are, however, expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in the Certificates are to be accomplished by entries made on the books of Direct and Indirect Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive Certificates representing their ownership interests in Certificates, except in the event that use of the book-entry system for the Certificates is discontinued.

4. To facilitate subsequent transfers, all Certificates deposited by Direct Participants with DTC are registered in the name of DTC’s partnership nominee, Cede & Co. or such other name as may be requested by an authorized representative of DTC. The deposit of Certificates with DTC and their registration in the name of Cede & Co. or such other nominee do not effect any change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of the Certificates; DTC’s records reflect only the identity of the Direct Participants to whose accounts such Certificates are credited, which may or may not be the Beneficial Owners. The Direct and Indirect Participants will remain responsible for keeping account of their holdings on behalf of their customers.

5. Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants, and by Direct Participants and Indirect Participants to Beneficial Owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time. Beneficial Owners of Certificates may wish to take certain steps to augment transmission to them of notices of significant events with respect to the Certificates, such as prepayments, tenders, defaults, and proposed amendments to the Certificate documents. For example, Beneficial Owners of Certificates may wish to ascertain that the nominee holding the Certificates for their benefit has agreed to obtain and transmit notices to Beneficial Owners. In the alternative, Beneficial Owners may wish to provide their names and addresses to the registrar and request that copies of the notices be provided directly to them.

6. Prepayment notices will be sent to DTC. If less than all of the Certificates within an issue are being prepaid, DTC’s practice is to determine by lot the amount of the interest of each Direct Participant in such issue to be prepaid.

7. Neither DTC nor Cede & Co. (nor such other DTC nominee) will consent or vote with respect to the Certificates unless authorized by a Direct Participant in accordance with DTC’s
MMI Procedures. Under its usual procedures, DTC mails an Omnibus Proxy to City as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.’s consenting or voting rights to those Direct Participants to whose accounts the Certificates are credited on the record date (identified in a listing attached to the Omnibus Proxy).

8. Prepayment proceeds, distributions, and interest payments on the Certificates will be made to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC. DTC’s practice is to credit Direct Participants’ accounts, upon DTC’s receipt of funds and corresponding detail information from City or the trustee on payable date in accordance with their respective holdings shown on DTC’s records. Payments by Participants to Beneficial Owners will be governed by standing instructions and customary practices, as is the case with securities held for the accounts of customers in bearer form or registered in “street name,” and will be the responsibility of such Participant and not of DTC nor its nominee, the trustee, or City, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of prepayment proceeds, distributions, and dividend payments to Cede & Co. (or such other nominee as may be requested by an authorized representative of DTC) is the responsibility of City or the trustee, disbursement of such payments to Direct Participants will be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners will be the responsibility of Direct and Indirect Participants.

9. DTC may discontinue providing its services as securities depository with respect to the Certificates at any time by giving reasonable notice to City or the trustee. Under such circumstances, in the event that a successor securities depository is not obtained, Certificates are required to be printed and delivered.

10. The City may decide to discontinue use of the system of book-entry-only transfers through DTC (or a successor securities depository). In that event, Certificate certificates will be printed and delivered to DTC.

11. The information in this section concerning DTC and DTC’s book-entry system has been obtained from sources that City believes to be reliable, but City takes no responsibility for the accuracy thereof.
APPENDIX G

CITY INVESTMENT POLICY
TRUST AGREEMENT

Dated as of October 1, 2016

among

U.S. BANK NATIONAL ASSOCIATION,

as trustee

CITY OF PACIFICA FINANCING AUTHORITY

and the

CITY OF PACIFICA

Relating to

$________

2016 Refunding Certificates of Participation
(2008 Certificate Refinancing)
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APPENDIX A  DEFINED TERMS
APPENDIX B  FORM OF CERTIFICATE OF PARTICIPATION
TRUST AGREEMENT

This TRUST AGREEMENT (this “Trust Agreement”), dated as of October 1, 2016, is among U.S. BANK NATIONAL ASSOCIATION, a national banking association organized and existing under the laws of the United States of America, as trustee (the “Trustee”), the CITY OF PACIFICA FINANCING AUTHORITY, a joint exercise of powers agency duly organized and existing under the laws of the State of California (the “Authority”), and the CITY OF PACIFICA, a municipal corporation duly organized and existing under the laws of the State of California (the “City”).

BACKGROUND:

1. In order to refinance outstanding lease obligations of the City and provide financing for certain public capital improvements, the City and the Authority have previously entered into a First Amended and Restated Site Lease dated as of May 1, 2006 (the “2006 Site Lease”), under which the City has leased certain real property from the Authority and the Authority has leased such real property back to the City under a First Amended and Restated Lease Agreement dated as of May 1, 2006, as amended by an Amendment to First Amended and Restated Lease Agreement dated as of August 1, 2008 (collectively, the “2008 Lease Agreement”).

2. Under the 2008 Lease Agreement, the City is obligated to pay semiannual lease payments (the “2008 Lease Payments”) to the Authority as the rental of the Leased Property, and the 2008 Lease Payments are evidenced and represented by the Certificates of Participation (2008 Conversion of 2006 Auction Rate Certificates) which have been executed and delivered in the aggregate original principal amount of $19,815,000 (the “2008 Certificates”), under a Trust Agreement dated as of August 1, 2008, among the City, the Authority and Deutsche Bank National Trust Company, as trustee.

3. The 2008 Lease Payments and the 2008 Certificates are subject to prepayment on any date at a prepayment price equal to 102% of the principal components of the 2008 Lease Payments to be prepaid, plus accrued interest on such prepaid principal components to the prepayment date.

4. In order to provide funds to refinance the 2008 Lease Payments and the 2008 Certificates and thereby realize debt service savings, the City and the Authority have amended and restated the 2006 Site Lease under an Amended and Restated Site Lease dated as of October 1, 2016 (the “Site Lease”), and the City and the Authority have amended and restated the 2008 Lease under an Amended and Restated Lease Agreement dated as of October 1, 2016 (the “Lease Agreement”), for the purpose, among others, of obligating the City to pay a reduced amount of semiannual lease payments (the “Lease Payments”) for the rental of the real property which is leased thereunder.

5. The Authority has assigned its right to receive the Lease Payments to U.S. Bank National Association, as trustee (the “Trustee”), and in consideration of such assignment the Trustee has agreed to execute and deliver 2016 Refunding Certificates of Participation (2008 Certificate Refinancing) in the aggregate principal amount of
$__________ (the “Certificates”), each evidencing a direct, undivided fractional interest in the Lease Payments, under this Trust Agreement.

AGREEMENT:

In consideration of the foregoing and the material covenants hereinafter contained, the City, the Authority and the Trustee formally covenant, agree and bind themselves as follows:

ARTICLE I

DEFINITIONS; RULES OF CONSTRUCTION

SECTION 1.01. Definitions. Unless the context clearly otherwise requires or unless otherwise defined herein, the capitalized terms used in this Trust Agreement have the meanings given them in Appendix A hereto. Any capitalized terms which are defined in the recitals of this Trust Agreement and not otherwise defined herein shall have the respective meanings given such terms in the recitals.

SECTION 1.02. Authorization. Each of the parties hereby represents and warrants that it has full legal authority and is duly empowered to enter into this Trust Agreement, and has taken all actions necessary to authorize the execution hereof by the officers and persons signing it.

SECTION 1.03. Interpretation.

(a) Unless the context otherwise indicates, words expressed in the singular include the plural and vice versa and the use of the neuter, masculine, or feminine gender is for convenience only and includes the neuter, masculine or feminine gender, as appropriate.

(b) Headings of articles and sections herein and the table of contents hereof are solely for convenience of reference, do not constitute a part hereof and do not affect the meaning, construction or effect hereof.

(c) All references herein to “Articles,” “Sections” and other subdivisions are to the corresponding Articles, Sections or subdivisions of this Trust Agreement; the words “herein,” “hereof,” “hereby,” “hereunder” and other words of similar import refer to this Trust Agreement as a whole and not to any particular Article, Section or subdivision hereof.
ARTICLE II

THE CERTIFICATES OF PARTICIPATION

SECTION 2.01. Authorization. The Trustee is hereby authorized and directed upon written request from the City to register, execute and deliver to the Original Purchaser, Certificates in the aggregate principal amount of $________. The Certificates evidence direct, undivided fractional ownership interests of the Owners thereof in the Lease Payments.

SECTION 2.02. Date. Each Certificate shall be dated as of the date of its execution and interest represented thereby shall be payable from the Interest Payment Date next preceding the date of execution thereof, unless:

(a) it is executed following a Record Date and on or before the next succeeding Interest Payment Date, in which event interest represented thereby shall be payable from such Interest Payment Date,

(b) unless it is executed on or before the first Record Date, in which event interest represented thereby shall be payable from the Closing Date, or

(c) if, as of the date of any Certificate, interest represented by such Certificate is in default, in which event interest represented thereby shall be payable from the Interest Payment Date to which interest has previously been paid or made available for payment with respect to such Certificate.

SECTION 2.03. Terms of Certificates. Principal represented by the Certificates is payable on January 1 in each of the respective years and in the respective amounts, and interest represented thereby is computed at the respective rates, as follows:

<table>
<thead>
<tr>
<th>Maturity Date (January 1)</th>
<th>Principal Amount</th>
<th>Interest Rate</th>
<th>Maturity Date (January 1)</th>
<th>Principal Amount</th>
<th>Interest Rate</th>
</tr>
</thead>
</table>

SECTION 2.04. Fully Registered Form; Interest. The Certificates will be delivered in the form of fully registered Certificates without coupons in the authorized denominations of $5,000 or any integral multiple thereof, except that no Certificate shall
represent principal payable in more than one year. The Trustee shall assign the Certificates such alphabetical and numerical designation as the Trustee deems appropriate.

Interest represented by the Certificates is payable on each Interest Payment Date to and including the date of maturity or prepayment, whichever is earlier, as provided in Section 2.09. Said interest represents the portion of Lease Payments designated as interest and coming due on each of the respective Interest Payment Dates. The share of the portion of Lease Payments designated as interest with respect to any Certificate shall be computed by multiplying the portion of Lease Payments designated as principal represented by such Certificate by the rate of interest represented by such Certificate (on the basis of a 360-day year consisting of twelve 30-day months).

SECTION 2.05. Book Entry System.

(a) Original Delivery. The Certificates will be initially executed and delivered in the form of a separate single fully registered Certificate (which may be typewritten) for each maturity of the Certificates. Upon initial delivery, the ownership of each such Certificate will be registered on the Registration Books in the name of the Nominee. Except as provided in subsection (c), the ownership of all of the Outstanding Certificates shall be registered in the name of the Nominee on the Registration Books.

With respect to Certificates the ownership of which is registered in the name of the Nominee, the City and the Trustee have no responsibility or obligation to any Depository System Participant or to any person on behalf of which the City holds an interest in the Certificates. Without limiting the generality of the immediately preceding sentence, the City and the Trustee have no responsibility or obligation with respect to (i) the accuracy of the records of the Depository, the Nominee or any Depository System Participant with respect to any ownership interest in the Certificates, (ii) the delivery to any Depository System Participant or any other person, other than a Certificate Owner as shown in the Registration Books, of any notice with respect to the Certificates, including any notice of prepayment, (iii) the selection by the Depository of the beneficial interests in the Certificates to be prepaid if the City elects to prepay the Certificates in part, (iv) the payment to any Depository System Participant or any other person, other than a Certificate Owner as shown in the Registration Books, of any amount with respect to principal, premium, if any, or interest represented by the Certificates or (v) any consent given or other action taken by the Depository as Owner of the Certificates. The City and the Trustee may treat and consider the person in whose name each Certificate is registered as the absolute owner of such Certificate for the purpose of payment of principal, premium, if any, and interest represented by such Certificate, for the purpose of giving notices of prepayment and other matters with respect to such Certificate, for the purpose of registering transfers of ownership of such Certificate, and for all other purposes whatsoever. The Trustee shall pay the principal, interest and premium, if any, represented by the Certificates only to the respective Owners or their respective attorneys duly authorized in writing, and all such payments shall be valid and effective to fully satisfy and discharge all obligations with respect to payment of principal, interest and premium, if any, represented by the Certificates to the extent of the sum or sums so paid. No person other than a Certificate Owner may receive a Certificate evidencing the obligation of the City to make payments of principal, interest and premium, if any, under this Trust Agreement. Upon delivery by the Depository to the Nominee of written notice
to the effect that the Depository has determined to substitute a new Nominee in its place, such new nominee shall become the Nominee hereunder for all purposes; and upon receipt of such a notice the City shall promptly deliver a copy of the same to the Trustee.

(b) Representation Letter. In order to qualify the Certificates for the Depository’s book-entry system, the City shall execute and deliver to such Depository a letter representing such matters as shall be necessary to so qualify the Certificates. The execution and delivery of such letter shall not in any way limit the provisions of subsection (a) above or in any other way impose upon the City or the Trustee any obligation whatsoever with respect to persons having interests in the Certificates other than the Certificate Owners. Upon the written acceptance by the Trustee, the Trustee shall agree to take all action reasonably necessary for all representations of the City in such letter with respect to the Trustee to at all times be complied with. In addition to the execution and delivery of such letter, the City may take any other actions, not inconsistent with this Trust Agreement, to qualify the Certificates for the Depository’s book-entry program.

(c) Transfers Outside Book-Entry System. If either (i) the Depository determines not to continue to act as Depository for the Certificates, or (ii) the City determines to terminate the Depository as such, then the City shall thereupon discontinue the book-entry system with such Depository. In such event, the Depository shall cooperate with the City and the Trustee in the issuance of replacement Certificates by providing the Trustee with a list showing the interests of the Depository System Participants in the Certificates, and by surrendering the Certificates, registered in the name of the Nominee, to the Trustee on or before the date such replacement Certificates are to be executed and delivered. The Depository, by accepting delivery of the Certificates, agrees to be bound by the provisions of this subsection (c). If, prior to the termination of the Depository acting as such, the City fails to identify another Securities Depository to replace the Depository, then the Certificates shall no longer be required to be registered in the Registration Books in the name of the Nominee, but shall be registered in whatever name or names the Owners transferring or exchanging Certificates shall designate, in accordance with the provisions hereof.

If the City determines that it is in the best interests of the beneficial owners of the Certificates that they be able to obtain certificated Certificates, the City may notify the Depository System Participants of the availability of such certificated Certificates through the Depository. In such event, the Trustee will execute, register, transfer and exchange Certificates as required by the Depository and others in appropriate amounts; and whenever the Depository requests, the Trustee and the City shall cooperate with the Depository in taking appropriate action (y) to make available one or more separate certificates evidencing the Certificates to any Depository System Participant having Certificates credited to its account with the Depository, or (z) to arrange for another Securities Depository to maintain custody of a single certificate evidencing such Certificates, all at the City’s expense.

(d) Payments to the Nominee. Notwithstanding any other provision of this Trust Agreement to the contrary, so long as any Certificate is registered in the name of the Nominee, all payments with respect to principal, interest and premium, if any, represented by such Certificate and all notices with respect to such Certificate shall be made and given, respectively, as provided in the letter described in subsection (b) of this Section or as otherwise instructed by the Depository.
SECTION 2.06. Form and Execution of Certificates. The Certificates shall be substantially in the form set forth in Appendix B hereto. The Trustee shall execute the Certificates with the manual signature of an authorized signatory of the Trustee. If any person whose signature appears on any Certificate ceases to be an authorized signatory before the date of delivery of said Certificate, such signature shall nevertheless be as effective as if such person had remained an authorized signatory until such date.

SECTION 2.07. Transfer and Exchange.

(a) Transfer of Certificates. The registration of any Certificate may, in accordance with its terms, be transferred upon the Registration Books by the person in whose name it is registered, in person or by duly authorized attorney, upon surrender of such Certificate for cancellation at the Office of the Trustee, accompanied by delivery of a written instrument of transfer in a form acceptable to the Trustee, manually executed. Whenever any Certificate or Certificates shall be surrendered for registration of transfer, the Trustee shall execute and deliver a new Certificate or Certificates representing the same maturity, interest rate and aggregate principal amount, in any authorized denominations. The City shall pay all costs of the Trustee incurred in connection with any such transfer, except that the Trustee may require the payment by the Certificate Owner of any tax or other governmental charge required to be paid with respect to such transfer.

(b) Exchange of Certificates. Certificates may be exchanged at the Office of the Trustee, for a like aggregate principal amount of Certificates representing other authorized denominations of the same interest rate and maturity. The City shall pay all costs of the Trustee incurred in connection with any such exchange, except that the Trustee shall require the payment by the Certificate Owner requesting such exchange of any tax or other governmental charge required to be paid with respect to such exchange.

(c) Limitations on Transfer or Exchange. The Trustee may refuse to transfer or exchange either (i) any Certificate during the period established by the Trustee for the selection of Certificates for prepayment, or (ii) any Certificate which the Trustee has selected for prepayment in whole or in part under the provisions of Section 3.02.

SECTION 2.08. Certificates Mutilated, Lost, Destroyed or Stolen. If any Certificate is mutilated, the Trustee, at the expense of the Owner of such Certificate, shall execute and deliver a new Certificate of like principal amount, interest rate and maturity in replacement for the Certificate so mutilated, but only upon surrender to the Trustee of the Certificate so mutilated. The Trustee shall cancel and destroy every mutilated Certificate so surrendered to it and shall deliver a certificate of destruction to the City at the request of the City. If any Certificate is lost, destroyed or stolen, evidence of such loss, destruction or theft must be submitted to the Trustee, and, if such evidence is satisfactory to the Trustee and if an indemnity satisfactory to the Trustee is given, the Trustee, at the expense of the Certificate Owner, shall execute and deliver a new Certificate of like principal amount, interest rate and maturity and numbered as the Trustee shall determine in lieu of and in replacement for the Certificate so lost, destroyed or stolen. The Trustee may require payment of an appropriate fee for each replacement Certificate delivered under this Section and of the expenses which may be incurred by the Trustee in carrying out the duties under this Section. Any Certificate delivered under the provisions of this Section in lieu of any Certificate alleged to be lost, destroyed or
stolen shall be equally entitled to the benefits of this Trust Agreement with all other Certificates secured by this Trust Agreement. The Trustee is not required to treat both the original Certificate and any replacement Certificate as being Outstanding for the purpose of determining the principal amount of Certificates which may be executed and delivered hereunder or for the purpose of determining any percentage of Certificates Outstanding hereunder, but both the original and replacement Certificate shall be treated as one and the same. Notwithstanding any other provision of this Section, in lieu of delivering a replacement for a Certificate which has been mutilated, lost, destroyed or stolen, and which has matured, the Trustee may make payment with respect to such Certificate upon receipt of indemnity satisfactory to the Trustee and the City.

SECTION 2.09. Payment. Payment of interest represented by any Certificate on any Interest Payment Date shall be made to the person appearing on the Registration Books as the Owner thereof as of the close of business on the Record Date immediately preceding such Interest Payment Date, such interest to be paid by check mailed to such Owner, by first class mail postage prepaid, at such Owner’s address as it appears on the Registration Books. At the written request of the Owner of Certificates in an aggregate principal amount of at least $1,000,000, which written request is on file with the Trustee prior to the Record Date preceding any Interest Payment Date, the Trustee shall pay interest represented by such Certificates coming due and payable on such Interest Payment Date by wire transfer in immediately available funds to such account in the United States as is specified in such written request. The principal, interest and prepayment premium, if any, represented by any Certificate at maturity or upon prepayment are payable in lawful money of the United States of America upon surrender of such Certificate at the Office of the Trustee.

SECTION 2.10. Execution of Documents and Proof of Ownership. Any request, direction, consent, revocation of consent, or other instrument in writing required or permitted by this Trust Agreement to be signed or executed by Certificate Owners may be in any number of concurrent instruments of similar tenor, and may be signed or executed by such Owners in person or by their attorneys or agents appointed by an instrument in writing for that purpose, or by any bank, trust company or other depository for such Certificates. Proof of the execution of any such instrument, or of any instrument appointing any such attorney or agent, and of the ownership of Certificates shall be sufficient for any purpose of this Trust Agreement (except as otherwise herein provided), if made in the following manner:

(a) The fact and date of the execution by any Owner or any Owner’s attorney or agent of any such instrument and of any instrument appointing any such attorney or agent, may be proved by a certificate, which need not be acknowledged or verified, of an officer of any bank or trust company located within the United States of America, or of any notary public, or other officer authorized to acknowledgments of deeds to be recorded in such jurisdictions, that the persons signing such instruments acknowledged before him the execution thereof. Where any such instrument is executed by an officer of an authority or association or a member of a partnership on behalf of such corporation, association or partnership, such certificate shall also constitute sufficient proof of authority.
(b) The fact of the ownership of Certificates by any person and the amount, the maturity and the numbers of such Certificates and the date of such person’s holding the same shall be proved by the Registration Books.

Nothing in this Section limits the Trustee to such proof, it being intended that the Trustee may accept any other evidence of the matters herein stated which the Trustee may deem sufficient. Any request or consent of the Owner of any Certificate binds every future Owner of the same Certificate in respect of anything done or suffered to be done by the Trustee under such request or consent.

SECTION 2.11. Registration Books. The Trustee shall keep or cause to be kept sufficient records for the registration and registration of transfer of the Certificates, which shall at all reasonable times be open to inspection by the City and the Authority upon prior notice, during regular business hours; and, upon presentation for such purpose, the Trustee shall, under such reasonable regulations as it may prescribe, register or transfer or cause to be registered or transferred, on the Registration Books, Certificates as hereinbefore provided.

ARTICLE III
PREPAYMENT OF CERTIFICATES

SECTION 3.01. Prepayment.

(a) Optional Prepayment. The Certificates maturing on or before January 1, 20__, are not subject to optional prepayment before their respective stated maturities. The Certificates maturing on or after January 1, 20__, are subject to prepayment prior to their respective stated maturities, at the option of the City, in whole, or in part among maturities on such basis as designated by the City in writing to the Trustee and by lot within any one maturity, on January 1, 20__, or on any date thereafter, upon payment of a prepayment price equal to 100% of the principal amount to be prepaid, together with accrued interest to the date fixed for prepayment, without premium.

(b) Prepayment From Net Proceeds of Insurance or Condemnation. The Certificates are subject to mandatory prepayment, in whole or in part on any Business Day, among maturities on a pro rata basis and by lot within a maturity, from the Net Proceeds of insurance or eminent domain proceedings credited towards the prepayment of the Lease Payments under Section 8.3 of the Lease and Article VI, at a prepayment price equal to 100% of the principal amount to be prepaid, together with accrued interest represented thereby to the date fixed for prepayment, without premium.

SECTION 3.02. Selection of Certificates for Prepayment. Whenever provision is made in this Trust Agreement for the prepayment of Certificates and less than all Outstanding Certificates of any maturity are called for prepayment, the Trustee shall select Certificates of such maturity for prepayment by lot. For the purposes of such selection, Certificates shall be deemed to be composed of $5,000 portions, and any such portion may be separately prepaid. The Trustee shall promptly notify the City and the Authority in writing of the Certificates or portions thereof so selected for prepayment.
SECTION 3.03. Notice of Prepayment. When prepayment is authorized or required under Section 3.01, the Trustee shall give notice of the prepayment of the Certificates on behalf and at the expense of the City. Such notice shall:

(a) state the prepayment date and prepayment price;
(b) state the numbers or maturities of the Certificates to be prepaid, if less than all of the then Outstanding Certificates are to be called for prepayment;
(c) if a Certificate is to be prepaid only in part, identify the portion of the Certificate which is to be prepaid;
(d) require that such Certificates be surrendered on the prepayment date at the Office of the Trustee for prepayment at said prepayment price;
(e) state that interest represented by the Certificates will not accrue from and after the prepayment date; and
(f) state that on the prepayment date the principal and premium, if any, represented by each Certificate will become due and payable, together with accrued interest represented thereby to the prepayment date, and that from and after such date interest represented thereby ceases to accrue and be payable.

The Trustee has no liability for any designation of the CUSIP numbers of the Certificates to be prepaid, and neither the failure to identify the CUSIP numbers of the Certificates to be prepaid nor any incorrect designation of such CUSIP numbers will affect the sufficiency of the proceedings for the prepayment of such Certificates or the cessation of accrual of interest represented thereby from and after the date fixed for prepayment.

The Trustee shall mail notice of prepayment by first class mail with postage prepaid, to the Securities Depositories and to the Owners of Certificates designated for prepayment at their respective addresses appearing on the Registration Books, at least 30 days but not more than 60 days prior to the prepayment date. Neither the failure to receive any such notice nor any defect in any notice so mailed shall affect the sufficiency of the proceedings for the prepayment of such Certificates or the cessation of accrual of interest represented thereby from and after the date fixed for prepayment.

SECTION 3.04. Rescission of Prepayment Notice. The City may rescind any prepayment of the Certificates, and notice thereof, for any reason on any date prior to the date fixed for such prepayment by causing written notice of the rescission to be given to the Owners of the Certificates so called for prepayment. Notice of rescission of prepayment shall be given in the same manner in which the notice of prepayment was originally given. The actual receipt of notice of such rescission shall not be a condition precedent to rescission and failure to receive such notice or any defect in such notice shall not affect the validity of the rescission. The City, the Authority or the Trustee shall have no liability to the Owners of any Certificates, or any other party, as a result of the
City's decision to rescind a prepayment of any Certificates pursuant to the provisions of this Section.

SECTION 3.05. Partial Prepayment of Certificates. Upon surrender of any Certificate prepaid in part only, the Trustee shall execute, register and deliver to the Owner thereof, at the expense of the City, a new Certificate or Certificates of authorized denominations equal in aggregate principal amount to the unprepaid portion of the Certificate surrendered and of the same interest rate and the same maturity.

SECTION 3.06. Effect of Notice of Prepayment. Moneys for the prepayment (including the interest to the applicable date of prepayment) of Certificates having been set aside in the Lease Payment Fund, the Certificates shall become due and payable on the date of such prepayment, and, upon presentation and surrender thereof at the Office of the Trustee, said Certificates shall be paid at the unpaid principal amount (or applicable portion thereof) represented thereby plus interest accrued and unpaid to said date of prepayment.

If, on said date of prepayment, moneys for the prepayment of all the Certificates to be prepaid, together with interest represented thereby to said date of prepayment, shall be held by the Trustee so as to be available therefor on such date of prepayment, then, from and after said date of prepayment, interest represented by the Certificates shall cease to accrue and become payable. All moneys held by the Trustee for the prepayment of Certificates shall be held in trust for the account of the Owners of the Certificates so to be prepaid, and shall be held by the Trustee in cash uninvested.

All Certificates paid at maturity or prepaid prior to maturity under the provisions of this Article shall be canceled upon surrender thereof.

SECTION 3.07. Purchase of Certificates. In lieu of prepayment of Certificates as provided in this Article, amounts held by the Trustee for such prepayment may, at the written request of the City Representative received by the Trustee at least 75 days prior to the selection of Certificates for prepayment, be applied by the Trustee to the purchase of Certificates at public or private sale as and when and at such prices (including brokerage, accrued interest and other charges) as the City may in its discretion direct, but not to exceed the prepayment price which would be payable if such Certificates were prepaid.
ARTICLE IV

DISPOSITION OF PROCEEDS OF SALE

SECTION 4.01. Application of Proceeds. On the Closing Date, the Original Underwriter shall transfer the proceeds of sale of the Certificates to the Trustee to be deposited and transferred by the Trustee as follows (provided that the Trustee may, in its discretion, establish a temporary fund or account to facilitate any of the following deposit and transfer):

(a) The Trustee shall deposit the amount of $_________ in the Costs of Issuance Fund.

(b) The Trustee shall transfer the amount of $_________ to the Escrow Agent for application pursuant to the Escrow Agreement, to be applied to the payment and prepayment of the 2008 Lease Payments and the 2008 Certificates.

SECTION 4.02. Establishment and Application of Costs of Issuance Fund. The Trustee shall establish, maintain and hold in trust a separate fund designated as the “Costs of Issuance Fund.” The Trustee shall disburse moneys in the Costs of Issuance Fund to pay the Costs of Issuance upon submission of written requisitions executed by a City Representative stating the person to whom payment is to be made, the amount to be paid, the purpose for which the obligation was incurred and that such payment is a proper charge against said fund. On September 1, 2016, the Trustee shall withdraw all remaining moneys in the Costs of Issuance Fund and deposit such moneys in the Lease Payment Fund, and the Trustee shall thereupon close the Costs of Issuance Fund.

ARTICLE V

LEASE PAYMENTS; LEASE PAYMENT FUND

SECTION 5.01. Assignment of Rights in Lease Agreement. Under the Assignment Agreement, the Authority has transferred, assigned and set over to the Trustee certain of its rights under the Lease Agreement, including but not limited to all of the Authority’s rights to receive and collect all of the Lease Payments and all other amounts required to be deposited in the Lease Payment Fund. The City shall pay to the Trustee all Lease Payments and other amounts which have been assigned to the Trustee under the Assignment Agreement. Any Lease Payments collected or received by the Authority shall be deemed to be held and to have been collected or received by the Authority as the agent of the Trustee, and the Authority shall immediately transfer all such Lease Payments and other amounts to the Trustee.

SECTION 5.02. Establishment of Lease Payment Fund. The Trustee shall establish a special fund designated as the “Lease Payment Fund.” All moneys at any time deposited by the Trustee in the Lease Payment Fund shall be held by the Trustee in trust for the benefit of the City and the Owners of the Certificates. So long as any Certificates are Outstanding, neither the City nor the Authority has any beneficial right or interest in the Lease Payment Fund, or the moneys deposited therein, except only as
provided in this Trust Agreement, and the Trustee shall apply the Lease Payment Fund solely as set forth in this Trust Agreement.

SECTION 5.03. Deposits. The Trustee shall deposit all Lease Payments received by it in the Lease Payment Fund, including any moneys received by the Trustee for deposit therein under Section 5.01 or under Article VI hereof, or Article VIII of the Lease Agreement, and any other moneys required to be deposited therein under the Lease Agreement or under this Trust Agreement.

SECTION 5.04. Application of Moneys. The Trustee shall apply amounts in the Lease Payment Fund solely for the purpose of paying the principal, interest and prepayment premiums (if any) represented by the Certificates as the same become due and payable, in accordance with the provisions hereof.

SECTION 5.05. Surplus. Any surplus remaining in the Lease Payment Fund, after prepayment and payment of all Certificates, including premiums and accrued interest (if any) and payment of any applicable fees and expenses to the Trustee or provision for such prepayment or payment having been made to the satisfaction of the Trustee, shall be withdrawn by the Trustee and remitted to the City.

ARTICLE VI

INSURANCE AND CONDEMNATION FUND

SECTION 6.01. Establishment of Insurance and Condemnation Fund; Application of Net Proceeds of Insurance Award. Any Net Proceeds of insurance collected by the City in the event of accident to or destruction of any component of the Leased Property shall be paid to the Trustee under Section 5.1 of the Lease Agreement and deposited by the Trustee promptly upon receipt thereof in a special fund designated as the “Insurance and Condemnation Fund” which the Trustee shall thereupon establish. If the City determines and notifies the Trustee in writing of its determination, within 90 days following the date of such deposit, that the replacement, repair, restoration, modification or improvement of the Leased Property is not economically feasible or in the best interests of the City, then such Net Proceeds shall be promptly transferred by the Trustee to the Lease Payment Fund and applied to the prepayment of Lease Payments under Section 8.3 of the Lease Agreement and the corresponding prepayment of Certificates under Section 3.01(b), which prepayment shall be made on the first Interest Payment Date for which notice of prepayment can be timely given. Notwithstanding the foregoing provisions of this Section, the determination of the City to apply Net Proceeds to the prepayment of Certificates is subject to the following:

(a) if the Leased Property is damaged or destroyed in full, such Net Proceeds may be transferred to the Lease Payment Fund to be used to prepay Outstanding Certificates only if such Net Proceeds, together with other available moneys, are sufficient to cause the corresponding prepayment of all Lease Payments allocable to the Leased Property; and
(b) if the Leased Property is damaged or destroyed in part but not in whole, such Net Proceeds may be transferred to the Lease Payment Fund to be used to prepay Outstanding Certificates only if the Lease Payments which result after the corresponding abatement thereof under Section 5.3 of the Lease Agreement are sufficient to pay the full amount of principal and interest represented by the Certificates which remain Outstanding after such prepayment.

All Net Proceeds deposited in the Insurance and Condemnation Fund and not so transferred to the Lease Payment Fund shall be applied to the prompt replacement, repair, restoration, modification or improvement of the damaged or destroyed portions of the Leased Property by the City, upon receipt of written requisitions of the City stating with respect to each payment to be made (a) the name and address of the person, firm or corporation to whom payment is due, (b) the amount to be paid and (c) that each obligation mentioned therein has been properly incurred, is a proper charge against the Insurance and Condemnation Fund, has not been the basis of any previous withdrawal, and specifying in reasonable detail the nature of the obligation. Any balance of the Net Proceeds remaining after the City shall file a written certificate with the Trustee stating that such work has been completed shall, after payment of all amounts then due and owing to the Trustee hereunder, be paid to the City.

SECTION 6.02. Deposit and Application of Net Proceeds of Eminent Domain Award. If all or any part of the Leased Property is taken by eminent domain proceedings (or sold to a government threatening to exercise the power of eminent domain) the Net Proceeds therefrom shall be deposited with the Trustee in the Insurance and Condemnation Fund, under Section 5.1 of the Lease Agreement, and shall be applied and disbursed by the Trustee as follows:

(a) If the City gives written notice to the Trustee of its determination that (i) such eminent domain proceedings have not materially affected the interest of the City in the Leased Property or the ability of the City to meet any of its financial obligations under the Lease Agreement, and (ii) that such proceeds are not needed for repair, replacement or rehabilitation of the Leased Property, and the City has given written notice to the Trustee of such determination, the Trustee shall transfer such proceeds to the Lease Payment Fund to be credited towards the payment of the Lease Payments as they become due and payable.

(b) If the City gives written notice to the Trustee of its determination that (i) such eminent domain proceedings have not materially affected the interest of the City in the Leased Property or the ability of the City to meet any of its financial obligations under the Lease Agreement, and (ii) such proceeds are needed for repair, replacement or rehabilitation of the Leased Property, the Trustee shall pay to the City, or to its order, from said proceeds such amounts as the City may expend for the repair or rehabilitation of the Leased Property, upon the filing of requisitions of the City Representative meeting the requirements of Section 6.01.
(c) If (i) less than all of the Leased Property is taken in such eminent domain proceedings or sold to a government threatening the use of eminent domain powers, and if the City gives written notice to the Trustee of its determination that such eminent domain proceedings have materially affected the interest of the City in the Leased Property or the ability of the City to meet any of its financial obligations under the Lease Agreement, or (ii) all of the Leased Property is taken in such eminent domain proceedings, then the Trustee shall transfer such proceeds to the Lease Payment Fund to be credited toward the prepayment of the Lease Payments under Section 8.3 of the Lease Agreement and applied to the corresponding prepayment of Certificates under Section 3.01(b), which prepayment shall be made on the first prepayment date for which notice of prepayment can be timely given.

In making any such determination whether to repair, replace or rehabilitate the Leased Property under this Section, the City may obtain, but is not required to obtain, at its expense, the report of an independent engineer or other independent professional consultant, a copy of which must be filed with the Trustee. Any such determination by the City is final.

ARTICLE VII

MONEYS IN FUNDS; INVESTMENTS

SECTION 7.01. Held in Trust. The moneys and Permitted Investments held by the Trustee under this Trust Agreement are irrevocably held in trust for the benefit of the City and the Owners of the Certificates solely for the purposes herein specified, and such moneys, and any income or interest earned thereon, shall be expended only as provided in this Trust Agreement, and shall not be subject to levy or attachment or lien by or for the benefit of any creditor of the Authority, the Trustee, the City or the Owner of any Certificates.

SECTION 7.02. Investments Authorized. Upon the written request of a City Representative filed with the Trustee from time to time, moneys held by the Trustee in any fund or account hereunder shall be invested and reinvested by the Trustee in Permitted Investments which mature not later than the date such moneys are required or estimated by the City to be required to be expended hereunder. In the absence of any written request of the City directing the investment of uninvested moneys held by the Trustee hereunder, the Trustee shall invest such moneys in Permitted Investments described in clause (e) of the definition thereof. Such investments, if registrable, shall be registered in the name of the Trustee, as trustee or in the name of its nominee, and shall be held by the Trustee. The Trustee may purchase or sell to itself or any affiliate, as principal or agent, investments authorized by this Section. Such investments and reinvestments shall be made giving full consideration to the time at which funds are required to be available. The Trustee may act as purchaser or agent in the making or disposing of any investment. Whenever in this Trust Agreement any moneys are required to be transferred by the City to the Trustee, such transfer may be accomplished by transferring a like amount of Permitted Investments. For purposes of acquiring any
investments hereunder, the Trustee may commingle funds held by it hereunder. The Trustee is not responsible or liable for any loss suffered in connection with any investment of funds made by it in accordance with this Section.

SECTION 7.03. Accounting. The Trustee shall furnish to the City, not less than monthly, an accounting (in the form customarily used by the Trustee) of all investments and other transactions made by the Trustee under this Trust Agreement.

The City acknowledges that to the extent regulations of the Comptroller of the Currency or other applicable regulatory entity grant the City the right to receive brokerage confirmations of security transactions as they occur, the City specifically waives receipt of such confirmations to the extent permitted by law. The Trustee will furnish the City periodic cash transaction statements which will include detail for all investment transactions made by the Trustee hereunder.

SECTION 7.04. Allocation of Earnings. Any income, profit or loss on such investments shall be deposited in or charged to the respective funds from which such investments were made.

SECTION 7.05. Valuation and Disposition of Investments.

(a) Except as otherwise provided in subsection (b) of this Section, the City covenants that all investments of amounts deposited in any fund or account created by or under this Trust Agreement, or otherwise containing gross proceeds of the Certificates (within the meaning of Section 148 of the Tax Code) shall be acquired, disposed of and valued (as of the date that valuation is required by this Trust Agreement or the Tax Code) at Fair Market Value as such term is defined in subsection (d) below. The Trustee has no duty in connection with the determination of Fair Market Value other than to follow the express investment directions of the City in any written directions of a City Representative.

(b) Investments in funds or accounts (or portions thereof) that are subject to a yield restriction under applicable provisions of the Tax Code shall be valued by the City at their present value (within the meaning of Section 148 of the Tax Code); provided that the City shall provide written notice to the Trustee as to which funds are subject to a yield restriction.

(c) For the purpose of determining the amount in any fund, the value of Permitted Investments credited to such fund shall be valued by the Trustee at least quarterly at the market value thereof. The Trustee may sell at the best price reasonably obtainable, or present for prepayment, any Permitted Investment so purchased by the Trustee whenever it shall be necessary in order to provide moneys to meet any required payment, transfer, withdrawal or disbursement from the fund to which such Permitted Investment is credited, and the Trustee shall not be liable or responsible for any loss resulting from any such Permitted Investment.

(d) For purposes of this Section, the term “Fair Market Value” means the price at which a willing buyer would purchase the investment from a willing seller in a bona fide, arm’s length transaction (determined as of the date the contract to purchase or sell the investment becomes binding) if the investment is traded on an established securities market (within the meaning of Section 1273 of the Tax Code) and, otherwise, the term
“Fair Market Value” means the acquisition price in a bona fide arm’s length transaction (as referenced above) if (i) the investment is a certificate of deposit that is acquired in accordance with applicable regulations under the Tax Code, (ii) the investment is an agreement with specifically negotiated withdrawal or reinvestment provisions and a specifically negotiated interest rate (for example, a guaranteed investment contract, a forward supply contract or other investment agreement) that is acquired in accordance with applicable regulations under the Tax Code, (iii) the investment is a United States Treasury Security – State and Local Government Series that is acquired in accordance with applicable regulations of the United States Bureau of Public Debt, or (iv) any commingled investment fund in which the City and any related parties do not own more than a 10% beneficial interest therein if the return paid by the fund is without regard to the source of the investment.

ARTICLE VIII

THE TRUSTEE

SECTION 8.01. Appointment of Trustee. U.S. Bank National Association is hereby appointed Trustee by the Authority and the City for the purpose of receiving all moneys required to be deposited with the Trustee hereunder and to allocate, use and apply the same as provided in this Trust Agreement. The Authority and the City agree that they will maintain a Trustee having a corporate trust office in the State of California and having a combined capital and surplus (or whose related bank holding company has a combined capital and surplus) of at least $50,000,000, and which shall be subject to supervision or examination by Federal or state authority, so long as any Certificates are Outstanding. If such bank or trust company publishes a report of condition at least annually under law or to the requirements of any supervising or examining authority above referred to then for the purpose of this Section the combined capital and surplus of such bank or trust company shall be deemed to be its combined capital and surplus as set forth in its most recent report of condition so published.

The City and the Authority covenant that they will maintain a Trustee qualified under the provisions of the foregoing provisions of this Section, so long as any Certificates are Outstanding.

The Trustee is hereby authorized to pay or prepay the Certificates when duly presented as provided herein for payment at maturity, or on prepayment, or on purchase by the Trustee as directed by the City prior to maturity in accordance with Section 3.06, and to cancel all Certificates upon payment thereof. The Trustee shall keep accurate records of all funds administered by it and of all Certificates paid and discharged. The Trustee shall be compensated for its services rendered under the provisions of this Trust Agreement.

SECTION 8.02. Acceptance of Trusts. The Trustee hereby accepts the express trusts imposed upon it by this Trust Agreement, and agrees to perform said trusts, but only upon and subject to the following express terms and conditions:

(a) The Trustee, prior to the occurrence of an Event of Default and after curing or waiver of all Events of Default which may have occurred,
undertakes to perform such duties and only such duties as are specifically set forth in this Trust Agreement. In case an Event of Default has occurred (which has not been cured or waived) the Trustee may exercise such of the rights and powers vested in it by this Trust Agreement, and shall use the same degree of care and skill in their exercise, as a reasonable corporate trustee would exercise or use under the circumstances.

(b) No provision in this Trust Agreement requires the Trustee to expend or risk its own funds or otherwise incur any financial liability in the performance of any of its duties hereunder, or in the exercise of any of its rights or powers, if repayment of such funds or adequate indemnity against such risk or liability is not in the conclusive opinion of the Trustee satisfactorily assured to it.

(c) The Trustee is not responsible or liable for any recital herein, or in the Certificates, or for any of the supplements thereto or instruments of further assurance, or for the validity or sufficiency of the security for the Certificates executed and delivered hereunder or intended to be secured hereby and the Trustee shall not be bound at any time to ascertain or inquire as to the observance or performance of any covenants, conditions or agreements on the part of the Authority or the City under the Lease Agreement. The Trustee is not responsible or liable for any loss suffered in connection with any investment of funds made by it in accordance with Article VII.

(d) The Trustee is not accountable for the use of any Certificates delivered hereunder. The Trustee may become the Owner of Certificates with the same rights which it would have if not the Trustee; may acquire and dispose of other bonds or evidence of indebtedness of the City with the same rights it would have if it were not the Trustee; and may act as a depository for and permit any of its officers or directors to act as a member of, or in any other capacity with respect to, any committee formed to protect the rights of Owners of Certificates, whether or not such committee shall represent the Owners of the majority in aggregate principal amount of the Certificates then Outstanding.

(e) The Trustee shall be protected in acting upon any notice, request, requisition, consent, certificate, order, affidavit, letter, telegram, direction, facsimile transmission, electronic mail or other paper or document believed by the trust officer responsible for the administrative of the trusts created hereunder to be genuine and correct and to have been signed or sent by the proper person or persons. Any action taken or omitted to be taken by the Trustee in good faith under this Trust Agreement upon the request or authority or consent of any person who at the time of making such request or giving such authority or consent is the Owner of any Certificate, shall be conclusive and binding upon all future Owners of the same Certificate and upon Certificates delivered in exchange therefor or
in place thereof. The Trustee is not bound to recognize any person as an Owner of any Certificate or to take any action at such person’s request unless such Certificate shall be deposited with the Trustee or satisfactory evidence of the ownership of such Certificate shall be furnished to the Trustee.

(f) As to the existence or non-existence of any fact or as to the sufficiency or validity of any instrument, paper or proceeding, the Trustee shall be entitled to rely upon a certificate signed by an Authority Representative or a City Representative as sufficient evidence of the facts therein contained and prior to the occurrence of an Event of Default of which the Trustee has been given notice or is deemed to have notice, as provided in Section 8.02(h), shall also be at liberty to accept a similar certificate to the effect that any particular dealing, transaction or action is necessary or expedient, but may at its discretion secure such further evidence deemed by it to be necessary or advisable, but shall in no case be bound to secure the same. The Trustee may accept a certificate of an Authority Representative or a City Representative to the effect that an authorization in the form therein set forth has been adopted by the Authority or the City, as the case may be, as conclusive evidence that such authorization has been duly adopted, and is in full force and effect.

(g) The permissive right of the Trustee to do things enumerated in this Trust Agreement may not be construed as a duty and the Trustee is not answerable for other than its negligence or willful misconduct. The immunities and exceptions from liability of the Trustee extend to its officers, directors, employees and agents.

(h) The Trustee is not required to take notice or be deemed to have notice of any Event of Default hereunder except failure by the City to make any of the Lease Payments to the Trustee required to be made by the City under the Lease Agreement or failure by the Authority or the City to file with the Trustee any document required by this Trust Agreement or the Lease Agreement to be so filed subsequent to the delivery of the Certificates, unless the Trustee shall be specifically notified in writing of such default by the Authority, the City or the Owners of at least 25% in aggregate principal amount of Certificates then Outstanding. All notices or other instruments required by this Trust Agreement to be delivered to the Trustee must, in order to be effective, be delivered at the Office of the Trustee, and in the absence of such notice so delivered the Trustee may conclusively assume there is no Event of Default except as aforesaid.

(i) At any and all reasonable times the Trustee, and its duly authorized agents, attorneys, experts, engineers, accountants and representatives, have the right (but not any duty) fully to inspect the Leased Property, including all books, papers and records of the Authority or the City pertaining to the Leased Property and the
Certificates, and to take such memoranda from and with regard thereto as may be desired.

(j) The Trustee is not required to give any bond or surety in respect of the execution of the said trusts and powers or otherwise in respect of the premises.

(k) Notwithstanding anything elsewhere in this Trust Agreement with respect to the execution of any Certificates, the withdrawal of any cash, the release of any property, or any action whatsoever within the purview of this Trust Agreement, the Trustee has the right, but is not required, to demand any showings, certificates, opinions, appraisals or other information, or corporate action or evidence thereof, in addition to that by the terms hereof required as a condition of such action, which may be deemed desirable by the Trustee for the purpose of establishing the right of the Authority or the City to the execution of any Certificates, the withdrawal of any cash, or the taking of any other action by the Trustee.

(l) Before taking any action referred to in Section 12.03 at the direction of the Certificate Owners, the Trustee may require that a satisfactory indemnity bond be furnished by the Certificate Owners, or any of them, for the reimbursement of all expenses to which it may be put and to protect it against all liability, except liability which is adjudicated to have resulted from its negligence or willful misconduct in connection with any such action.

(m) All moneys received by the Trustee shall, until used or applied or invested as herein provided, be held in trust for the purposes for which they were received but need not be segregated from other funds except to the extent required by law. The Trustee has no liability for interest on any moneys received hereunder except such as may be agreed upon, other than interest derived from investments made or required to be made under Section 7.02.

(n) The Trustee is not responsible for the sufficiency of the Lease Agreement, its right to receive moneys under the Lease Agreement, or the value of or title to the Leased Property.

(o) The Trustee is not liable with respect to any action taken or omitted to be taken by it in good faith in accordance with the direction of the Owners of a majority in aggregate principal amount of the Outstanding Certificates relating to the time, method and place of conducting any proceeding for any remedy available to the Trustee, or exercising any trust or power conferred upon the Trustee, under this Trust Agreement.

(p) The Trustee may execute any of the trusts or powers hereof and perform the duties required of it hereunder by or through attorneys, agents, or receivers and the Trustee is not responsible for any misconduct or negligence on the part of any attorney, agent, or
receiver appointed with due care. The Trustee shall be entitled to advice of counsel concerning all matters of trust and its duty hereunder and shall be protected in any action taken or suffered by it hereunder in reliance on such advice.

(q) The Trustee is not liable for any error of judgment made in good faith, unless it shall be proved that the Trustee was negligent in ascertaining the pertinent facts.

(r) The Trustee shall not be considered in breach of or in default in its obligations hereunder or progress in respect thereto in the event of enforced delay in the performance of such obligations due to unforeseeable causes beyond its control and without its fault or negligence, including, but not limited to, acts of God or of the public enemy or terrorists, acts of a government, acts of the other party, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, earthquakes, explosion, mob violence, riot, inability to procure or general sabotage or rationing of labor, equipment, facilities, sources of energy, material or supplies in the open market, litigation or arbitration involving a party or others relating to zoning or other governmental action or inaction pertaining to the Leased Property, malicious mischief, condemnation, and unusually severe weather or delays of suppliers or subcontractors due to such causes or any similar event and/or occurrences beyond the control of the Trustee.

(s) The Trustee agrees to accept and act upon facsimile transmission of written instructions and/or directions under this Trust Agreement provided, however, that: (i) subsequent to such facsimile transmission of written instructions and/or directions the Trustee shall forthwith receive the originally executed instructions and/or directions, (ii) such originally executed instructions and/or directions shall be signed by a person as may be designated and authorized to sign for the party signing such instructions and/or directions, and (iii) the Trustee has received a current incumbency certificate containing the specimen signature of such designated person.

(t) The Trustee is authorized and directed by the City to enter into the Assignment Agreement.

SECTION 8.03. FEES, CHARGES AND EXPENSES OF TRUSTEE. The Trustee shall be entitled to payment and reimbursement by the City for reasonable fees for its services rendered hereunder and all advances, agent and counsel fees (including expenses) and other expenses reasonably and necessarily made or incurred by the Trustee in connection with such services. The Trustee has a first lien with right of payment prior to payment on account of principal, premium, if any, and interest represented by any Certificate upon the amounts held hereunder for the foregoing fees, charges and expenses incurred by it respectively. The Trustee shall be entitled to interest on all moneys advanced by it in the performance of its duties hereunder at the maximum legal rate allowable.
SECTION 8.04. Notice to Certificate Owners of Default. If an Event of Default occurs of which the Trustee has been given or is deemed to have notice, as provided in Section 8.02(h), then the Trustee shall promptly give written notice thereof by first class mail, postage prepaid, to the Owner of each Outstanding Certificate, unless such Event of Default has been cured before the giving of such notice; provided, however that unless such Event of Default consists of the failure by the City to make any Lease Payment when due, the Trustee may elect not to give such notice to the Certificate Owners if and so long as the Trustee in good faith determines that it is in the best interests of the Certificate Owners not to give such notice.

SECTION 8.05. Removal of Trustee. The City may remove the Trustee at any time, unless an Event of Default has occurred and is continuing, and shall remove the Trustee (a) if at any time requested to do so by an instrument or concurrent instruments in writing signed by the Owners of a majority in aggregate principal amount of the Certificates then Outstanding (or their attorneys duly authorized in writing) or (b) if at any time the Trustee ceases to be eligible in accordance with Section 8.01, or shall become incapable of acting, or shall be adjudged a bankrupt or insolvent, or a receiver of the Trustee or its property shall be appointed, or any public officer shall take control or charge of the Trustee or of its property or affairs for the purpose of rehabilitation, conservation or liquidation. In each case such removal shall be accomplished by the giving of 30 days' prior written notice of such removal by the City to the Trustee, whereupon the City shall appoint a successor Trustee in accordance with Section 8.07.

SECTION 8.06. Resignation by Trustee. The Trustee and any successor Trustee may at any time resign by giving written notice by registered or certified mail to the City. Upon receiving such notice of resignation, the City shall promptly appoint a successor Trustee in accordance with Section 8.07. Any resignation or removal of the Trustee and appointment of a successor Trustee shall become effective upon acceptance of appointment by the successor Trustee. Upon such acceptance, the City shall mail notice thereof to the Certificate Owners at their respective addresses set forth on the Registration Books.

SECTION 8.07. Appointment of Successor Trustee. If the Trustee resigns or is removed under Sections 8.05 or 8.06, respectively, the City shall promptly appoint a successor Trustee. If the City for any reason whatsoever fails to appoint a successor Trustee within 30 days following the delivery to the Trustee of the instrument described in Section 8.05 or within 30 days following the receipt of notice by the City under Section 8.06, the Trustee may apply to any federal or state court for the appointment of a successor Trustee meeting the requirements of Section 8.01. Any such successor Trustee appointed by such court will become the successor Trustee hereunder notwithstanding any action by the City purporting to appoint a successor Trustee following the expiration of such 30 day period.

SECTION 8.08. Merger or Consolidation. Any company or association into which the Trustee may be merged or converted or with which it may be consolidated or any company resulting from any merger, conversion or consolidation to which it shall be a party or any company or association to which the Trustee may sell or transfer all or substantially all of its corporate trust business, provided that such company or association shall be eligible under Section 8.01, shall be the successor to the Trustee and vested with all of the title to the trust estate and all of the trusts, powers, discretions, immunities, privileges and all other matters as was its predecessor, without the
execution or filing of any paper or further act, anything herein to the contrary notwithstanding.

SECTION 8.09. Concerning any Successor Trustee. Every successor Trustee appointed hereunder shall execute, acknowledge and deliver to its predecessor and also to the Authority and the City an instrument in writing accepting such appointment hereunder and thereupon such successor, without any further act, deed or conveyance, shall become fully vested with all the estates, properties, rights, powers, trusts, duties and obligations of its predecessors; but such predecessor shall, nevertheless, on the written request of the City, or of its successor, execute and deliver an instrument transferring to such successor all the estates, properties, rights, powers and trusts of such predecessor hereunder; and every predecessor Trustee shall deliver all securities and moneys held by it as the Trustee hereunder to its successor. Should any instrument in writing from the City be required by any successor Trustee for more fully and certainly vesting in such successor the estate, rights, powers and duties hereby vested or intended to be vested in the predecessor, any and all such instruments in writing shall, on request, be executed, acknowledged and delivered by the City. The resignation of any Trustee and the instrument or instruments removing any Trustee and appointing a successor hereunder, together with all other instruments provided for in this Article, shall be filed or recorded by the successor Trustee in each recording office where the Assignment Agreement has been filed or recorded.

SECTION 8.10. Non-Liability of Trustee. The recitals, statements and representations by the City and the Authority contained in this Trust Agreement or in the Certificates shall be taken and construed as made by and on the part of the City and the Authority, as the case may be, and not by the Trustee, and the Trustee has no responsibility, obligation or liability for the correctness of any thereof.

The Trustee makes no representation or warranty, express or implied as to the title, value, design, compliance with specifications or legal requirements, quality, durability, operation, condition, merchantability or fitness for any particular purpose or fitness for the use contemplated by the City or the Authority of the Leased Property. In no event is the Trustee liable for special or consequential damages in connection with or arising from the Lease Agreement for the existence, furnishing or use of the Leased Property.

The Trustee is not (a) responsible for the sufficiency or enforceability of the Lease Agreement or the assignment under the Assignment Agreement of its rights to receive Lease Payments, (b) deemed to have knowledge of any Event of Default unless and until it has received written notice thereof or, with respect to Section 7.1(a) of the Lease Agreement, has actual knowledge thereof or except as provided in Section 8.02(h) or (c) accountable for the use or application by the City or the Authority of any funds which the Trustee has released under this Trust Agreement.

SECTION 8.11. Actions Through Agents. The Trustee may execute any of the trusts or powers hereof and perform the duties required of it hereunder by or through attorneys, agents, or receivers, and shall be entitled to advice of counsel concerning all matters of trust and its duty hereunder, and the Trustee is not answerable for the default or misconduct of any such attorney, agent, or receiver selected by it with reasonable care. The Trustee is not answerable for the exercise of any discretion or power under
this Trust Agreement or for anything whatever in connection with the funds and accounts established hereunder, except only for its own negligence or willful misconduct.

SECTION 8.12. Nature of Trust Engagement. The Trustee undertakes to perform such duties and only such duties as are expressly and specifically set forth in the Trust Agreement and no implied covenants or obligations whatsoever shall be read into the Trust Agreement against the Trustee. In accepting the trusts hereby created, the Trustee acts solely as Trustee and not in its individual capacity. All persons, including without limitation the Owners, the City and the Authority having any claim against the Trustee arising from the Trust Agreement shall look only to the funds and accounts hereunder for payment except as otherwise provided herein; provided, however, that nothing in this sentence is intended or shall be construed to apply to, or limit the source of payment of, claims against the Trustee arising from the negligence or willful misconduct of the Trustee. Under no circumstances is the Trustee liable in its individual capacity for payment of the obligations represented by the Certificates.

ARTICLE IX

MODIFICATION OR AMENDMENT

SECTION 9.01. Amendments Permitted. This Trust Agreement and the rights and obligations of the Owners of the Certificates may be modified or amended at any time by a supplemental agreement which shall become effective when the written consents of the Owners of a majority in aggregate principal amount of the Certificates then Outstanding, exclusive of Certificates disqualified as provided in Section 13.05, has been filed with the Trustee. No such modification or amendment may (a) extend or have the effect of extending the fixed maturity of any Certificate or reducing the interest rate represented thereby or extending the time of payment of interest, or reducing the amount of principal represented thereby or reducing any premium payable upon the prepayment thereof, without the express consent of the Owner of such Certificate, or (b) reduce or have the effect of reducing the percentage of Certificates required for the affirmative vote or written consent to an amendment or modification hereof, or (c) modify any of the rights or obligations of the Trustee without its written assent thereto. Any such supplemental agreement shall become effective as provided in Section 9.02.

This Trust Agreement and the rights and obligations of the Owners of the Certificates may be modified or amended at any time by a supplemental agreement, without the consent of any Certificate Owners, but only to the extent permitted by law and only:

(a) to add to the covenants and agreements of any party, other covenants to be observed, or to surrender any right or power herein reserved to the Authority or the City,

(b) to cure, correct or supplement any ambiguous or defective provision contained herein,

(c) in regard to questions arising hereunder, as the parties hereto or thereto may deem necessary or desirable and which shall not, in
the opinion of Bond Counsel, materially adversely affect the interests of the Owners of the Certificates,

(d) if and to the extent permitted in the opinion of Bond Counsel filed with the Trustee, the City and the Authority, to delete or modify any of the provisions hereof or thereof relating to the exclusion from gross income of interest represented by the Certificates for federal income tax purposes, or

(e) to conform to any amendments of the Lease Agreement which are permitted to be made under Section 6.5 thereof.

Any such supplemental agreement shall become effective upon execution and delivery by the parties hereto.

Section 9.02. Procedure for Amendment with Written Consent of Certificate Owners. If the consents of the Owners of the Certificates are required to any amendment hereof under Section 9.01, such amendment shall be required to comply with the provisions of this Section. A copy of such supplemental agreement, together with a request to the Certificate Owners for their consent thereto, shall be mailed by the Trustee to each Owner of a Certificate at such Owner’s address as set forth on the Registration Books, but failure to mail copies of such supplemental agreement and request shall not affect the validity of the supplemental agreement when assented to as provided in this Section.

Such supplemental agreement may not become effective unless there shall be filed with the Trustee the written consents of the Owners of a majority in aggregate principal amount of the Certificates then Outstanding (exclusive of Certificates disqualified as provided in Section 13.05) and a notice has been mailed as hereinafter provided in this Section. Each such consent shall be effective only if accompanied by proof of ownership of the Certificates for which such consent is given, which proof shall be such as is permitted by Section 2.10. Any such consent shall be binding upon the Owner of the Certificate giving such consent and on any subsequent Owner (whether or not such subsequent Owner has notice thereof) unless such consent is revoked in writing by the Owner giving such consent or a subsequent Owner by filing such revocation with the Trustee prior to the date when the notice hereinafter provided for has been mailed.

After the Owners of the required percentage of Certificates have filed their consents to such supplemental agreement, the Trustee shall mail a notice to the Owners of the Certificates in the manner hereinbefore provided in this Section for the mailing of such supplemental agreement of the notice of adoption thereof, stating in substance that such supplemental agreement has been consented to by the Owners of the required percentage of Certificates and will be effective as provided in this Section (but failure to mail copies of said notice shall not affect the validity of such supplemental agreement or consents thereto). A record, consisting of the papers required by this Section to be filed with the Trustee, shall be conclusive proof of the matters therein stated. Such supplemental agreement shall become effective upon the mailing of such last-mentioned notice, and such supplemental agreement shall be deemed conclusively binding upon the parties hereto and the Owners of all Certificates at the expiration of 60 days after such filing, except in the event of a final decree of a court of competent jurisdiction
setting aside such consent in a legal action or equitable proceeding for such purpose commenced within such 60 day period.

SECTION 9.03. **Effect of Supplemental Agreement.** From and after the time any supplemental agreement becomes effective under this Article, this Trust Agreement shall be deemed to be modified and amended in accordance therewith, the respective rights, duties and obligations of the parties hereto, and the rights of the affected Certificate Owners, as the case may be, shall thereafter be determined, exercised and enforced hereunder subject in all respects to such modification and amendment, and all the terms and conditions of any supplemental agreement shall be deemed to be part of the terms and conditions of this Trust Agreement for any and all purposes.

SECTION 9.04. **Endorsement or Replacement of Certificates Delivered After Amendments.** The Trustee may determine that Certificates delivered after the effective date of any action taken as provided in this Article shall bear a notation, by endorsement or otherwise, in form approved by the Trustee, as to such action. In that case, upon demand on the Owner of any Certificate Outstanding at such effective date and presentation of such Owner’s Certificate for the purpose at the Office of the Trustee, a suitable notation shall be made on such Certificate. The Trustee may determine that the delivery of substitute Certificates, so modified as in the opinion of the Trustee is necessary to conform to such Certificate Owners’ action is necessary or desirable, which substitute Certificates shall thereupon be prepared, executed and delivered. In that case, upon demand on the Owner of any Certificate then Outstanding, such substitute Certificate shall be exchanged at the Office of the Trustee, without cost to such Owner, for a Certificate of the same character then Outstanding, upon surrender of such Outstanding Certificate.

SECTION 9.05. **Amendatory Endorsement of Certificates.** The provisions of this Article shall not prevent any Certificate Owner from accepting any amendment as to the particular Certificates held by him, provided that proper notation thereof is made on such Certificates.

SECTION 9.06. **Opinion of Counsel.** Prior to executing any supplemental Trust Agreement, the Trustee shall be furnished an opinion of counsel, upon which it may conclusively rely to the effect that all conditions precedent to the execution of such supplemental Trust Agreement under this Trust Agreement have been satisfied and such supplemental Trust Agreement is authorized and permitted under this Trust Agreement and does not adversely affect the exclusion of interest with respect to the Certificates from gross income for federal income tax purposes or adversely affect the exemption of interest with respect to the Certificates from personal income taxation by the State of California.

SECTION 9.07. **Notice to Rating Agencies.** The City shall send copies of any proposed amendment or modification hereof to each rating agency which then maintains a rating on the Certificates, at least 10 days prior to the effective date of any such amendment or modification.
ARTICLE X

OTHER COVENANTS

SECTION 10.01. Compliance With and Enforcement of Lease Agreement. The City covenants to perform all obligations and duties imposed on it under the Lease Agreement. The Authority covenants and agrees with the Owners of the Certificates to perform all obligations and duties imposed on it under the Lease Agreement.

The City will not do or permit anything to be done, or omit or refrain from doing anything, in any case where any such act done or permitted to be done, or any such omission of or refraining from action, would or might be a ground for cancellation or termination of the Lease Agreement by the Authority thereunder. The Authority and the City, immediately upon receiving or giving any notice, communication or other document in any way relating to or affecting their respective estates, or either of them, in the Leased Property, which may or can in any manner affect such estate of the City, will deliver the same, or a copy thereof, to the Trustee.

SECTION 10.02. Observance of Laws and Regulations. The City will keep, observe and perform all valid and lawful obligations or regulations now or hereafter imposed on it by contract, or prescribed by any law of the United States, or of the State of California, or by any officer, board or commission having jurisdiction or control, as a condition of the continued enjoyment of any and every right, privilege or franchise now owned or hereafter acquired by the City, including its right to exist and carry on business as a public agency, to the end that such rights, privileges and franchises shall be maintained and preserved, and shall not become abandoned, forfeited or in any manner impaired.

SECTION 10.03. Prosecution and Defense of Suits. The City shall promptly, upon request of the Trustee or any Certificate Owner, from time to time take such action as may be necessary or proper to remedy or cure any defect in or cloud upon the title to the Leased Property, whether now existing or hereafter developing and shall prosecute all such suits, actions and other proceedings as may be appropriate for such purpose and shall indemnify and save the Trustee and every Certificate Owner harmless from all loss, cost, damage and expense, including attorneys’ fees, which they or any of them may incur by reason of any such defect, cloud, suit, action or proceeding.

SECTION 10.04. Recordation and Filing. The City shall record and file the Lease Agreement or a memorandum thereof, the Site Lease, the Assignment Agreement and all such documents as may be required by law (and shall take all further actions which may be necessary or be reasonably required by the Trustee), all in such manner, at such times and in such places as may be required by law in order fully to preserve, protect and perfect the security of the Trustee and the Certificate Owners.

SECTION 10.05. Tax Covenants.

(a) Private Business Use Limitation. The City shall assure that the proceeds of the Certificates are not used in a manner which would cause any of the obligations of the City under the Lease Agreement to become “private activity bonds” under and within the meaning of Section 141(a) of the Tax Code.
(b) **Private Loan Limitation.** The City shall assure that no more than the lesser of $5,000,000 or 5% of the aggregate amount of the proceeds of the Certificates are used, directly or indirectly, to make or finance a loan (other than loans constituting nonpurpose obligations as defined in the Tax Code or constituting assessments) to persons other than state or local government units.

(c) **Federal Guarantee Prohibition.** The City shall not take any action or permit or suffer any action to be taken if the result of the same would be to cause the obligations of the City under the Lease Agreement to be “federally guaranteed” within the meaning of Section 149(b) of the Tax Code.

(d) **No Arbitrage.** The City shall not take, or permit or suffer to be taken by the Trustee or otherwise, any action with respect to the proceeds of the Certificates or of any other obligations which, if such action had been reasonably expected to have been taken, or had been deliberately and intentionally taken, on the Closing Date, would have caused the obligations of the City under the Lease Agreement to be “arbitrage bonds” within the meaning of Section 148(a) of the Tax Code.

(e) **Rebate of Excess Investment Earnings to United States.** The City shall calculate or cause to be calculated all Excess Investment Earnings in all respects at the times and in the manner required under the Tax Code. The City shall pay the full amount of Excess Investment Earnings to the United States of America in such amounts, at such times and in such manner as may be required under the Tax Code. Such payments shall be made by the City from any source of legally available funds of the City.

The City shall keep or cause to be kept, and retain or cause to be retained for a period of six years following the retirement of the Certificates, records of the determinations made under this subsection (e). In order to provide for the administration of this subsection (e), the City may provide for the employment of independent attorneys, accountants and consultants compensated on such reasonable basis as the City may deem appropriate. The Trustee has no duty or obligation to monitor or enforce compliance by the City of any of the requirements herein.

**SECTION 10.06. Continuing Disclosure.** The City shall comply with and carry out all of the provisions of that certain Continuing Disclosure Certificate executed by the City as of the Closing Date, as originally executed and as it may be amended from time to time in accordance with its terms. Notwithstanding any other provision of this Trust Agreement, failure of the City to comply with such Continuing Disclosure Certificate does not constitute an Event of Default; except that any Participating Underwriter (as such term is defined in such Continuing Disclosure Certificate) or any Owner or beneficial owner of the Certificates may take such actions as may be necessary and appropriate to compel performance by the City of its obligations under this Section, including seeking mandate or specific performance by court order.

**SECTION 10.07. Further Assurances.** The Authority and the City will make, execute and deliver any and all such further resolutions, instruments and assurances as may be reasonably necessary or proper to carry out the intention or to facilitate the performance of this Trust Agreement and the Lease Agreement, and for the better
assuring and confirming unto the Owners of the Certificates the rights and benefits provided herein.

ARTICLE XI

LIMITATION OF LIABILITY

SECTION 11.01. Limited Liability of District. Except for the payment of Lease Payments when due in accordance with the Lease Agreement and the performance of the other covenants and agreements of the City contained in the Lease Agreement and this Trust Agreement, the City has no pecuniary obligation or liability to any of the other parties or to the Owners of the Certificates with respect to this Trust Agreement or the terms, execution, delivery or transfer of the Certificates, or the distribution of Lease Payments to the Owners by the Trustee, except as expressly set forth herein.

SECTION 11.02. No Liability of the Authority for Trustee Performance. Neither the City nor the Authority has any obligation or liability to any of the other parties or to the Owners of the Certificates with respect to the performance by the Trustee of any duty imposed upon it under this Trust Agreement.

SECTION 11.03. Indemnification of Trustee. The Authority and the City shall indemnify and save the Trustee, its directors, officers, agents and employees harmless from and against (whether or not litigated) all claims, losses, costs, expenses, liability and damages, including legal fees and expenses, arising out of any of the following:

(a) the use, maintenance, condition or management of, or from any work or thing done on, the Leased Property by the Authority or the City,

(b) any breach or default on the part of the Authority or the City in the performance of any of their respective obligations under this Trust Agreement and any other agreement made and entered into for purposes of the Leased Property,

(c) any act of negligence of the Authority or the City or of any of their respective agents, contractors, servants, employees, licensees with respect to the Leased Property,

(d) any act of negligence of any assignee of, or purchaser from the Authority or the City or of any of its or their respective agents, contractors, servants, employees or licensees with respect to the Leased Property,

(e) the application of the proceeds of the Certificates,

(f) the actions of any other party, including but not limited to the ownership, operation or use of the Leased Property by the Authority or the City, or
(g) the Trustee’s exercise and performance of its powers and duties hereunder.

No indemnification is made under this Section or elsewhere in this Trust Agreement for willful misconduct, negligence under this Trust Agreement by the Trustee, its officers, agents, employees, successors or assigns. the Authority’s and the City’s obligations hereunder will remain valid and binding notwithstanding maturity and payment or discharge of the Certificates and notwithstanding any resignation or removal of the Trustee.

SECTION 11.04. Opinion of Counsel. Before being required to take any action, the Trustee may, at the expense of the City, require an opinion of counsel acceptable to the Trustee, or an opinion of Bond Counsel acceptable to the Trustee with respect to any federal tax matters, or a verified certificate of any party hereto, or both, concerning the proposed action. If it does so in good faith, Trustee shall be absolutely protected in relying on any such opinion or certificate obtained by the Trustee.

SECTION 11.05. Limitation of Rights to Parties and Certificate Owners. Nothing in this Trust Agreement or in the Certificates expressed or implied is intended or shall be construed to give any person other than the City, the Authority, the Trustee and the Owners of the Certificates, any legal or equitable right, remedy or claim under or in respect of this Trust Agreement or any covenant, condition or provision hereof; and all such covenants, conditions and provisions are and shall be for the sole and exclusive benefit of the City, the Authority, the Trustee and said Owners.

ARTICLE XII

EVENTS OF DEFAULT AND REMEDIES

SECTION 12.01. Assignment of Rights. Under the Assignment Agreement the Authority has transferred, assigned and set over to the Trustee certain of the Authority’s rights in and to the Lease Agreement (excepting only the Authority’s rights under Sections 3.4, 4.10, 6.3 and 7.4 thereof), including without limitation all of the Authority’s rights to exercise such rights and remedies conferred on the Authority under the Lease Agreement as may be necessary or convenient (a) to enforce payment of the Lease Payments and any other amounts required to be deposited in the Lease Payment Fund or the Insurance and Condemnation Fund, and (b) otherwise to exercise the Authority’s rights and take any action to protect the interests of the Trustee or the Certificate Owners in an Event of Default.

SECTION 12.02. Events of Default Defined. As provided in Section 8.1 of the Lease Agreement, any one or more of the following events constitutes an Event of Default:

(a) Failure by the City to pay any Lease Payment or other payment required to be paid hereunder at the time specified in the Lease Agreement.
(b) Failure by the City to observe and perform any covenant, condition or agreement on its part to be observed or performed in the Lease Agreement or in this Trust Agreement, other than as referred to in the preceding subsection (a), for a period of 30 days after written notice specifying such failure and requesting that it be remedied has been given to the City by the Authority or the Trustee; provided, however, that if in the reasonable opinion of the City the failure stated in the notice can be corrected, but not within such 30-day period, the failure will not constitute an Event of Default if the City commences to cure the failure within such 30-day period and thereafter diligently and in good faith cures the failure in a reasonable period of time.

(c) The filing by the City of a voluntary petition in bankruptcy, or failure by the City promptly to lift any execution, garnishment or attachment, or adjudication of the City as a bankrupt, or assignment by the City for the benefit of creditors, or the entry by the City into an agreement of composition with creditors, or the approval by a court of competent jurisdiction of a petition applicable to the City in any proceedings instituted under the provisions of the Federal Bankruptcy Code, as amended, or under any similar acts which may hereafter be enacted.

SECTION 12.03. Remedies. If an Event of Default happens, then and in each and every such case during the continuance of such Event of Default, the Trustee may, and at the written direction of the Owners of a majority in aggregate principal amount of the Certificates then Outstanding the Trustee shall, exercise any and all remedies available under law or granted under the Lease; provided, however, that notwithstanding anything herein or in the Lease Agreement to the contrary, there shall be no right under any circumstances to accelerate the maturities of the Certificates or otherwise to declare any Lease Payment not then in default to be immediately due and payable.

SECTION 12.04. Application of Funds. All moneys received by the Trustee under any right given or action taken under the provisions of this Article or Article VII of the Lease Agreement shall be applied by the Trustee in the order following upon presentation of the several Certificates, and the stamping thereon of the payment if only partially paid, or upon the surrender thereof if fully paid -

First, to the payment of the fees, costs and expenses of the Trustee in declaring such Event of Default and in taking any remedial action with respect thereto, including reasonable compensation to its agents, attorneys and counsel, and including such other necessary costs relating to the administration of the foregoing and to events leading up thereto;

Second, to the payment of the whole amount then owing and unpaid with respect to the Certificates for principal and interest, with interest on the overdue principal and installments of interest at the rate set forth in Section 3.3(c) of the Lease Agreement (but such interest on overdue installments of interest shall be paid only to the extent funds are available therefor following payment of principal and interest and interest
on overdue principal, as aforesaid, and in case such moneys shall be insufficient to pay in full the whole amount so owing and unpaid with respect to the Certificates, then to the payment of such principal and interest without preference or priority of principal over interest, or of interest over principal, or of any installment of interest over any other installment of interest, ratably to the aggregate of such principal and interest.

SECTION 12.05. Institution of Legal Proceedings. If one or more Events of Default occur and are continuing, the Trustee in its discretion may, and upon the written request of the Owners of a majority in principal amount of the Certificates then Outstanding, and upon being indemnified to its satisfaction therefor, shall, proceed to protect or enforce its rights or the rights of the Owners of Certificates by a suit in equity or action at law, either for the specific performance of any covenant or agreement contained herein, or in aid of the execution of any power herein granted, or by mandamus or other appropriate proceeding for the enforcement of any other legal or equitable remedy as the Trustee shall deem most effectual in support of any of its rights or duties hereunder.

SECTION 12.06. Non-waiver. Nothing in this Article or in any other provision of this Trust Agreement or in the Certificates, affects or impairs the obligation of the City, which is absolute and unconditional, to pay or prepay the Lease Payments as provided in the Lease Agreement. No delay or omission of the Trustee or any Certificate Owner to exercise any right or power arising upon the happening of any Event of Default shall impair any such right or power or shall be construed to be a waiver of any such Event of Default or an acquiescence therein, and every power and remedy given by this Article to the Trustee or the Certificate Owners may be exercised from time to time and as often as shall be deemed expedient by the Trustee or the Certificate Owners.

SECTION 12.07. Remedies Not Exclusive. No remedy herein conferred upon or reserved to the Trustee or the Certificate Owners is intended to be exclusive of any other remedy, and every such remedy shall be cumulative and shall be in addition to every other remedy given hereunder or now or hereafter existing, at law or in equity or by statute or otherwise.

SECTION 12.08. Power of Trustee to Control Proceedings. If the Trustee, upon the happening of an Event of Default, takes any action, by judicial proceedings or otherwise, under its duties hereunder, whether upon its own discretion or upon the direction of the Owners of a majority in aggregate principal amount of the Certificates then Outstanding, it has full power, in the exercise of its discretion for the best interests of the Owners of the Certificates, with respect to the continuance, discontinuance, withdrawal, compromise, settlement or other disposal of such action; provided, however, that the Trustee shall not, unless there no longer continues an Event of Default, discontinue, withdraw, compromise or settle, or otherwise dispose of any litigation pending at law or in equity, if at the time there has been filed with it a written request signed by the Owners of a majority in aggregate principal amount of the Outstanding Certificates opposing such discontinuance, withdrawal, compromise, settlement or other disposal of such litigation.

SECTION 12.09. Limitation on Certificate Owners’ Right to Sue Exclusive. No Owner of any Certificate delivered hereunder may institute any suit, action or proceeding
at law or in equity, for any remedy under or upon this Trust Agreement, unless (a) such Owner has previously given to the Trustee written notice of the occurrence of an Event of Default hereunder; (b) the Owners of a majority in aggregate principal amount of all the Certificates then Outstanding have requested the Trustee in writing to exercise the powers hereinbefore granted or to institute such action, suit or proceeding in its own name; (c) said Owners have tendered to the Trustee reasonable indemnity against the costs, expenses and liabilities to be incurred in compliance with such request; and (d) the Trustee has refused or omitted to comply with such request for a period of 60 days after such written request has been received by, and said tender of indemnity has been made to, the Trustee.

Such notification, request, tender of indemnity and refusal or omission are hereby declared, in every case, to be conditions precedent to the exercise by any Owner of Certificates of any remedy hereunder; it being understood and intended that no one or more Owners of Certificates has any right in any manner whatever by its or their action to enforce any right under this Trust Agreement, except in the manner herein provided, and that all proceedings at law or in equity with respect to an Event of Default shall be instituted, had and maintained in the manner herein provided and for the equal benefit of all Owners of the Outstanding Certificates.

SECTION 12.10. Possession of Certificates by Trustee Not Required. All rights and remedies granted to or exercisable by the Trustee hereunder or under the Lease Agreement may be exercised by the Trustee without possession of any of the Certificates or the production thereof at the trial or other proceeding relative thereto, and any suit, action or proceeding instituted by the Trustee hereunder or under the Lease Agreement shall be brought in its name for the benefit of all the Owners of such Certificates, subject to the provisions of this Trust Agreement.

ARTICLE XIII

DISCHARGE; ADMINISTRATIVE PROVISIONS

SECTION 13.01. Discharge Hereof. If and when the obligations represented by any Outstanding Certificates shall be paid and discharged in any one or more of the following ways:

(a) by well and truly paying or causing to be paid the principal, interest and prepayment premiums (if any) represented by such Certificates Outstanding, as and when the same become due and payable, or

(b) by depositing with the Trustee or any other fiduciary, under an escrow deposit and trust agreement, security for the payment of Lease Payments relating to such Certificates as more particularly described in Section 8.1 of the Lease Agreement, said security to be held by the Trustee on behalf of the City to be applied by the Trustee or by such other fiduciary to pay or prepay such Lease Payments as the same become due, under Section 8.1 of the Lease Agreement,
then notwithstanding that such Certificates have not been surrendered for payment, all rights hereunder of the Owners of such Certificates and all obligations of the Authority, the Trustee and the City with respect to such Certificates shall cease and terminate, except only the obligations of the Authority and the City under Section 11.03 and the obligations of the Trustee under Sections 2.07 and 2.08, and the obligation of the Trustee to pay or cause to be paid, from Lease Payments paid by or on behalf of the City from funds deposited under paragraph (b) of this Section, to the Owners of such Certificates not so surrendered and paid all sums represented thereby when due and in the event of deposits under paragraph (b), such Certificates shall continue to represent direct, undivided fractional interests of the Owners thereof in the Lease Payments.

Any funds held by the Trustee, at the time of discharge of the obligations represented by all Outstanding Certificates as a result of one of the events described in paragraphs (a) or (b) of this Section, which are not required for the payment to be made to Owners, shall, upon payment in full of all fees and expenses of the Trustee (including attorneys’ fees) then due, be paid over to the City.

SECTION 13.02. Records. The Trustee shall keep complete and accurate records of all moneys received and disbursed under this Trust Agreement, which shall be available for inspection by the City, the Authority and any Owner, or the agent of any of them, at any reasonable time during regular business hours upon prior notice.

SECTION 13.03. Notices. Any notice, request, complaint, demand or other communication under this Trust Agreement shall be given by first class mail or personal delivery to the party entitled thereto at its address set forth below, or by facsimile transmission or other form of telecommunication, at its number set forth below. Notice shall be effective either (a) upon transmission by facsimile transmission or other form of telecommunication, (b) 72 hours after deposit in the United States of America first class mail, postage prepaid, or (c) in the case of personal delivery to any person, upon actual receipt. the Authority, the City or the Trustee may, by written notice to the other parties, from time to time modify the address or number to which communications are to be given hereunder.

If to the City: City of Pacifica
or the Authority
170 Santa Maria Avenue
Pacifica, California 94044
Attention: Finance Director
Fax: (650) 359-6038

If to the Trustee: U.S. Bank National Association
One California Street, Suite 1000
San Francisco, California 94111
Attention: Global Corporate Trust Services
Fax: (415) 677-3768

SECTION 13.04. Disqualified Certificates. In determining whether the Owners of the requisite aggregate principal amount of Certificates have concurred in any demand, request, direction, consent or waiver under this Trust Agreement, Certificates which are owned or held by or for the account of the City (but excluding Certificates held in any employees’ retirement fund) shall be disregarded and deemed not to be Outstanding for the purpose of any such determination, provided, however, that for the purpose of
determining whether the Trustee shall be protected in relying on any such demand, request, direction, consent or waiver, only Certificates which the Trustee knows to be so owned or held shall be disregarded.

SECTION 13.05. Payment of Certificates After Discharge of Trust Agreement. Notwithstanding any provisions of this Trust Agreement, but subject to any applicable laws of the State of California relating to the escheat of funds or property, any moneys held by the Trustee in trust for the payment of the principal or interest represented by any Certificates and remaining unclaimed for two years after the principal represented by all of the Certificates has become due and payable (whether at maturity or upon call for prepayment or by acceleration as provided in this Trust Agreement), if such moneys were so held at such date, or two years after the date of deposit of such moneys if deposited after said date when all of the Certificates became due and payable, shall be repaid to the City free from the trusts created by this Trust Agreement, and all liability of the Trustee with respect to such moneys shall thereupon cease; provided, however, that before the repayment of such moneys to the City as aforesaid, the Trustee shall (at the request of and at the cost of the City) mail, by first class mail postage prepaid, to the Owners of Certificates which have not yet been paid, at the respective addresses shown on the Registration Books, a notice, in such form as may be deemed appropriate by the Trustee with respect to the Certificates so payable and not presented and with respect to the provisions relating to the repayment to the City of the moneys held for the payment thereof.

SECTION 13.06. Governing Law. This Trust Agreement shall be construed and governed in accordance with the laws of the State of California.

SECTION 13.07. Binding Effect; Successors. This Trust Agreement shall be binding upon and inure to the benefit of the parties and their respective successors and assigns. Whenever in this Trust Agreement either the Authority, the City or the Trustee is named or referred to, such reference shall be deemed to include the successors or assigns thereof, and all the covenants and agreements in this Trust Agreement contained by or on behalf of the Authority, the City or the Trustee shall bind and inure to the benefit of the respective successors and assigns thereof whether so expressed or not.

SECTION 13.08. Authority and City Representatives. Whenever under the provisions of this Trust Agreement the Authority or the City is required or permitted to take some action, including but not limited to the giving of any approval or the execution of some request, direction or other instrument, such action shall be made on behalf of the Authority by an Authority Representative and on behalf of the City by a City Representative, and any party hereto shall be fully authorized to rely upon any such action by an Authority Representative or a City Representative.

SECTION 13.09. Execution in Counterparts. This Trust Agreement may be executed in several counterparts, each of which shall be an original and all of which shall constitute but one and the same agreement.

SECTION 13.10. Delivery of Canceled Certificates. Whenever in this Trust Agreement provision is made for the surrender to or cancellation by the Trustee of any Certificates, the Trustee shall cancel and, unless directed in writing by the City
Representative, destroy such Certificates and shall deliver a certificate of destruction with respect thereto to the City.

SECTION 13.11. **Headings.** The headings or titles of the several Articles and Sections hereof, and any table of contents appended to copies hereof, shall be solely for convenience of reference and shall not affect the meaning, construction or effect of this Trust Agreement.

SECTION 13.12. **Waiver of Notice.** Whenever in this Trust Agreement the giving of notice by mail or otherwise is required, the giving of such notice may be waived in writing by the person entitled to receive such notice and in any case the giving or receipt of such notice are not conditions precedent to the validity of any action taken in reliance upon such waiver.

SECTION 13.13. **Separability of Invalid Provisions.** In case any one or more of the provisions contained in this Trust Agreement or in the Certificates shall for any reason be held to be invalid, illegal or unenforceable in any respect, then such invalidity, illegality or unenforceability shall not affect any other provision of this Trust Agreement, and this Trust Agreement shall be construed as if such invalid or illegal or unenforceable provision had never been contained herein. The Authority and the City hereby declare that they would have entered into this Trust Agreement and each and every other section, paragraph, sentence, clause or phrase hereof and authorized the delivery of the Certificates pursuant thereto irrespective of the fact that any one or more sections, paragraphs, sentences, clauses or phrases of this Trust Agreement may be held illegal, invalid or unenforceable.
IN WITNESS WHEREOF, the parties have executed this Trust Agreement as of the date and year first above written.

U.S. BANK NATIONAL ASSOCIATION,

as Trustee

By ________________________________
Authorized Officer

CITY OF PACIFICA FINANCING AUTHORITY

By ________________________________
Executive Director

Attest

______________________________
Secretary

CITY OF PACIFICA

By ________________________________
City Manager

Attest

______________________________
City Clerk
APPENDIX A

DEFINED TERMS

Unless the context clearly otherwise requires or unless otherwise defined herein, the capitalized terms defined in this Appendix A have the respective meanings given them in this Appendix when used in this Trust Agreement and when used in the Lease Agreement.

“Additional Payments” means the amounts payable by the City under Section 3.4 of the Lease Agreement.

“Assignment Agreement” means the Assignment Agreement, dated as of October 1, 2016, between the Authority as assignor and the Trustee as assignee, as originally executed or as thereafter amended under any duly authorized and executed amendments thereto.

“Authority” means the City of Pacifica Financing Authority, a joint exercise of powers agency duly organized and existing under the laws of the State of California.

“Authority Representative” means the Chairman, Executive Director, Treasurer or Secretary of the Authority, or any other person authorized by resolution of the Authority to act on behalf of the Authority under or with respect to this Trust Agreement.

“Bond Counsel” means (a) Jones Hall, A Professional Law Corporation, or (b) any other attorney or firm of attorneys of nationally recognized expertise with respect to legal matters relating to obligations the interest on which is excludable from gross income under Section 103 of the Tax Code.

“Business Day” means a day other than a Saturday, Sunday or legal holiday, on which banking institutions are not closed in the State of California, or in any state in which any Office of the Trustee is located.

“Certificates” means the $________ aggregate principal amount of 2016 Refunding Certificates of Participation (2008 Certificate Refinancing) executed and delivered and at any time Outstanding hereunder.

“Closing Date” means October ___, 2016, being the day when the Certificates, duly executed by the Trustee, are delivered to the Original Purchaser.

“City” means the City of Pacifica, a municipal corporation duly organized and existing under the laws of the State of California.

“City Representative” means the City Manager or the Director of Finance of the City, or any other person authorized by resolution of the City Council of the City to act on behalf of the City under or with respect to the Lease and this Trust Agreement.

“Costs of Issuance” means all items of expense directly or indirectly payable by or reimbursable to the City or the Authority relating to the execution and delivery of the Certificates and the refinancing of the 2008 Lease Payments, including but not limited to filing and recording costs, settlement costs, printing costs, reproduction and binding
costs, initial fees and charges of the Trustee and the Escrow Agent (which shall include legal fees and the first annual administration fee of the Trustee), financing discounts, legal fees and charges, insurance fees and charges, Reserve Policy premium, financial and other professional consultant fees, costs of rating agencies for credit ratings, fees for execution, transportation and safekeeping of the Certificates, and any charges and fees in connection with the foregoing.

“Costs of Issuance Fund” means the fund by that name established and held by the Trustee under Section 4.03.

“Depository” means (a) initially, DTC, and (b) any other Securities Depository acting as Depository under Section 2.05.

“Depository System Participant” means any participant in the Depository’s book-entry system.

“DTC” means The Depository Trust Company, New York, New York, and its successors and assigns.

“Escrow Agent” means U.S. Bank National Association, its successor and assigns, acting as escrow agent under the Escrow Agreement.

“Escrow Agreement” means the Escrow Agreement dated as of the Closing Date, between the City and the Escrow Agent, relating to the deposit, investment and application of funds for the purpose of prepaying and discharging the 2008 Lease Payments and the 2008 Certificates.

“Event of Default” means an event of default under the Lease Agreement, as defined in Section 8.1 thereof.

“Excess Investment Earnings” means an amount required to be rebated to the United States of America under Section 148(f) of the Tax Code due to investment of gross proceeds of the Certificates at a yield in excess of the yield on the Lease Payments.

“Federal Securities” means: (a) any direct general obligations of the United States of America (including obligations issued or held in book entry form on the books of the Department of the Treasury of the United States of America), the payment of principal of and interest on which are unconditionally and fully guaranteed by the United States of America; and (b) any obligations the principal of and interest on which are unconditionally guaranteed by the United States of America.

“Fiscal Year” means the twelve-month period beginning on July 1 of any year and ending on June 30 of the next succeeding year, or any other twelve-month period by the City as its fiscal year under written notice filed with the Trustee.

“Insurance and Condemnation Fund” means the fund by that name to be established and held by the Trustee under Section 6.01.

“Interest Payment Date” means January 1, 2017, and each January 1 and July 1 thereafter to and including the final date of maturity of the Certificates.
“Lease Agreement” means the Amended and Restated Lease Agreement dated as of October 1, 2016, between the Authority as lessor and the City as lessee, as originally executed or as thereafter amended under any duly authorized and executed amendments and supplements thereto.

“Lease Payment Date” means, with respect to any Interest Payment Date, the 5th Business Day preceding such Interest Payment Date.

“Lease Payment Fund” means the fund by that name established and held by the Trustee under Section 5.02.

“Lease Payments” means all payments required to be paid by the City under Section 3.3(a) of the Lease Agreement, including any prepayment thereof under Article VIII of the Lease Agreement.

“Leased Property” means all of the land which is more particularly described in Appendix A to the Lease Agreement, consisting generally of the land and improvements constituting a Public Safety Building located at 2705 Coast Highway in the City and the Fairmont West Park in the City. If the City exercises its option under Section 3.6 of the Lease Agreement with respect to the substitution of property or its option under Section 3.7 of the Lease Agreement with respect to the release of property, the term “Leased Property” will thereupon be modified accordingly.

“Moody’s” means Moody’s Investors Service, of New York, New York, its successors and assigns.

“Net Proceeds” means any insurance proceeds or eminent domain award (including any proceeds of sale to a governmental entity under threat of the exercise of eminent domain powers), paid with respect to the Leased Property, to the extent remaining after payment therefrom of all expenses incurred in the collection thereof.

“Nominee” means (a) initially, Cede & Co. as nominee of DTC, and (b) any other nominee of the Depository designated under Section 2.05(a).

“Office” means the corporate trust office of the Trustee in San Francisco, California, provided that for purposes of payment, prepayment, exchange, transfer, exchange, surrender and cancellation of Certificates, such term means the corporate trust office of the Trustee in St. Paul, Minnesota, or such other or additional offices as the Trustee may designate in writing to the Authority from time to time as the corporate trust office for purposes of this Trust Agreement.

“Original Purchaser” means US Bancorp, as original purchaser of the Certificates upon the negotiated sale thereof.

“Outstanding”, when used as of any particular time with respect to Certificates, means (subject to the provisions of Section 13.05) all Certificates theretofore executed and delivered by the Trustee under this Trust Agreement except (a) Certificates theretofore canceled by the Trustee or surrendered to the Trustee for cancellation; (b) Certificates deemed to have been paid under Section 13.01; and (c) Certificates in lieu
of or in exchange for which other Certificates has been executed and delivered by the Trustee under Section 2.08.

“Owner”, when used with respect to a Certificate, means the person in whose name the ownership of such Certificate shall be registered on the Registration Books.

“Permitted Encumbrances” means, as of any time: (a) liens for general ad valorem taxes and assessments, if any, not then delinquent, or which the City may permit to remain unpaid under Article IV of the Lease Agreement; (b) the Site Lease, the Lease Agreement and the Assignment Agreement; (c) any right or claim of any mechanic, laborer, materialman, supplier or vendor which is secured by a lien on the Leased Property; (d) the exceptions disclosed in the title insurance policy with respect to the Leased Property issued as of the Closing Date by Stewart Title Company of California; and (e) easements, rights of way, mineral rights, drilling rights and other rights, reservations, covenants, conditions or restrictions which exist of record and which the City certifies in writing will not materially impair the use of the Leased Property for its intended purposes.

“Permitted Investments” means any of the following which at the time of investment are legal investments under the laws of the State of California for the moneys proposed to be invested therein (the Trustee entitled to rely upon the investment direction of the City as a determination that such investment is such a legal investment):

(a) Federal Securities.

(b) obligations of any of the following federal agencies which obligations represent full faith and credit of the United States of America, including: Export-Import Bank, Farmers Home Administration, General Services Administration, U.S. Maritime Administration, Small Business Administration, Government National Mortgage Association, U.S. Department of Housing & Urban Development, and Federal Housing Administration;

(c) bonds, notes or other evidences of indebtedness rated Aa or better by Moody’s, issued by Fannie Mae or the Federal Home Loan Mortgage Corporation with remaining maturities not exceeding three years;

(d) U.S. dollar denominated deposit accounts (including those with the Trustee), federal funds and banker’s acceptances with domestic commercial banks which have a rating on their short term certificates of deposit on the date of purchase of rated P-2 or better by Moody’s, maturing no more than 360 days after the date of purchase;

(e) certificates of deposit issued by federal or State chartered savings and loan associations or in federal or State banks (including the Trustee and its affiliates) which are secured at all times by collateral described in the foregoing clauses (a) or (b) of this definition;
(f) commercial paper which is rated at the time of purchase in the single highest classification, rated P-2 or better by Moody’s, which matures not more than 270 days after the date of purchase;

(g) investments in a money market fund rated Aa-mf or better by Moody’s, which may include funds for which the Trustee or its affiliates provide investment advisory or other management services;

(h) bonds or notes issued by an state or municipality which are rated Aa or better by Moody’s;

(i) the Local Agency Investment Fund which is administered by the California Treasurer for the investment of funds belonging to local agencies within the State of California, provided for investment of funds held by the Trustee, the Trustee is entitled to make investments and withdrawals in its own name as Trustee.

“Record Date” means the close of business on the 15th day of the month following each Interest Payment Date, whether or not such 15th day is a Business Day.

“Registration Books” means the records maintained by the Trustee under Section 2.11 for the registration of the ownership and transfer of ownership of the Certificates.

“Rental Period” means each period during the Term of the Lease Agreement commencing on and including January 2 in each year and extending to and including the next succeeding January 1, except that the first Rental Period begins on the Closing Date and ends on January 1, 2017.

“Securities Depositories” means DTC; and, in accordance with then current guidelines of the Securities and Exchange Commission, such other addresses and/or such other securities depositories as the City designates in written notice filed with the Trustee.

“Site Lease” means the Amended and Restated Site Lease dated as of October 1, 2016, between the City as lessor and the Authority as lessee of the Leased Property, as originally executed or as thereafter amended under any duly authorized and executed amendments and supplements thereto.

“Tax Code” means the Internal Revenue Code of 1986 as in effect on the Closing Date or (except as otherwise referenced herein) as it may be amended to apply to obligations issued on the Closing Date, together with applicable temporary and final regulations promulgated, and applicable official public guidance published, under said Code.

“Term of the Lease” means the time during which the Lease Agreement is in effect, as provided in Section 3.2 thereof.

“Trust Agreement” means this Trust Agreement, as originally executed or as thereafter amended under any amendments or supplements hereto which are permitted to be made hereunder.
“Trustee” means U.S. Bank National Association, or any successor thereto acting as Trustee hereunder.

“2008 Certificates” means the Certificates of Participation (2008 Conversion of 2006 Auction Rate Certificates) which have been executed and delivered in the aggregate original principal amount of $19,815,000, under a Trust Agreement dated as of August 1, 2008, among the City, the Authority and Deutsche Bank National Trust Company, as trustee.

“2008 Lease Payments” means the amounts payable by the City as semiannual lease payments under the 2008 Lease Agreement.
APPENDIX B
FORM OF CERTIFICATE OF PARTICIPATION

No. R-______  ***$______***

2016 CERTIFICATE OF PARTICIPATION
(2008 Certificate Refinancing)

Evidencing the Direct, Undivided Fractional Interest of the Owner Thereof in Lease Payments to be Made by the

CITY OF PACIFICA

RATE OF INTEREST:  MATURITY DATE:  DATED DATE:  CUSIP:
____%  January 1, _____  October __, 2016

REGISTERED OWNER:

PRINCIPAL AMOUNT:  DOLLARS

THIS IS TO CERTIFY THAT the Registered Owner identified above, or registered assigns, as the registered owner (the “Registered Owner”) of this Certificate of Participation (this “Certificate”) is the owner of a direct, undivided fractional interest in Lease Payments (the “Lease Payments”) payable under a Lease Agreement dated as of October 1, 2016 (the “Lease Agreement”), between the City of Pacifica Financing Authority, a joint exercise of powers agency duly organized and existing under the laws of the State of California (the “Authority”) and the City of Pacifica, a municipal corporation duly organized and existing under the laws of the State of California (the “City”), which Lease Payments and certain other rights and interests under the Lease Agreement have been assigned to U.S. Bank National Association, as trustee (the “Trustee”).

The Registered Owner of this Certificate is entitled to receive, subject to the terms of the Lease Agreement, on the Maturity Date identified above, or any earlier prepayment date, the Principal Amount identified above representing a direct, undivided fractional share of the portion of the Lease Payments designated as principal, and to receive on January 1, 2017, and semiannually thereafter on July 1 and January 1 of each year (the “Interest Payment Dates”) until payment in full of said principal, the Registered Owner’s direct, undivided fractional share of the Lease Payments designated as interest coming due during the period immediately preceding each of the Interest Payment Dates.
Interest represented hereby shall be payable from the Interest Payment Date next preceding the date of execution of this Certificate unless (a) this Certificate is executed on an Interest Payment Date, in which event interest shall be payable from such Interest Payment Date, or (b) unless this Certificate is executed on or before December 15, 2016, in which event interest is payable from the Dated Date identified above. The Registered Owner’s share of the portion of the Lease Payments designated as interest is the result of the multiplication of the aforesaid share of the portion of the Lease Payments designated as principal by the Rate of Interest per annum identified above, calculated on the basis of a 360-day year comprised of twelve 30-day months. Principal represented hereby is payable in lawful money of the United States of America, upon presentation and surrender hereof at the corporate trust office of the Trustee in St. Paul, Minnesota, and interest represented hereby is payable by check mailed by first class mail by the Trustee on each Interest Payment Date to the Registered Owner at such Owner’s address as it appears on the registration books of the Trustee as of the close of business on the 15th day of the month preceding such Interest Payment Date.

This Certificate has been executed and delivered by the Trustee under the terms of a Trust Agreement dated as of October 1, 2016, between the Trustee, the Authority and the City (the “Trust Agreement”). The City has certified that it is authorized to enter into the Lease Agreement and the Trust Agreement under the laws of the State of California, for the purpose of leasing certain real property (the “Leased Property”) used for the municipal purposes of the City. Reference is hereby made to the Lease Agreement and the Trust Agreement (copies of which are on file at the office of the Trustee) for a description of the terms on which the Certificates are delivered, the rights thereunder of the owners of the Certificates, the rights, duties and immunities of the Trustee and the rights and obligations of the City under the Lease Agreement, to all of the provisions of the Lease Agreement and the Trust Agreement the Registered Owner of this Certificate, by acceptance hereof, assents and agrees.

The City is obligated under the Lease Agreement to pay the Lease Payments for the Leased Property from any source of available funds, subject to certain exceptions as set forth in the Lease Agreement. As more fully described in the Lease Agreement, the Lease Payments are subject to abatement during any period in which by reason of damage or destruction to the Leased Property in whole or in part, or by reason of eminent domain proceedings with respect to the Leased Property in whole or in part, there is substantial interference with the use and occupancy by the City of the Leased Property or any portion thereof; such abatement shall be in an amount agreed upon by the City and the Authority such that the resulting Lease Payments represent fair consideration for the use and occupancy of the remaining portions of the Leased Property. The obligation of the City to pay the Lease Payments does not constitute an obligation of the City for which the City is obligated to levy or pledge any form of taxation or for which the City has levied or pledged any form of taxation. The obligation of the City to pay the Lease Payments does not constitute a debt of the City, the State of California or any of its political subdivisions, and does not constitute an indebtedness within the meaning of any constitutional or statutory debt limitation or restriction.

The Certificates maturing on or before January 1, 20__, are not subject to optional prepayment before their respective stated maturities. The Certificates maturing on or after January 1, 20__, are subject to prepayment prior to their respective stated maturities, at the option of the City, in whole, or in part among maturities on such basis.
as designated by the City and by lot within any one maturity, on January 1, 20__, or on any date thereafter, upon payment of a prepayment price equal to 100% of the principal amount to be prepaid, together with accrued interest to the date fixed for prepayment, without premium.

As provided in the Trust Agreement, the Trustee shall mail notice of prepayment of the Certificates by first class mail, postage prepaid, not less than 30 nor more than 60 days before the prepayment date, to the registered owners of the Certificates to be prepaid, but neither failure to receive such notice nor any defect in the notice so mailed shall affect the sufficiency of the proceedings for prepayment or the cessation of accrual of interest represented thereby. If this Certificate is called for prepayment and payment is duly provided therefor as specified in the Trust Agreement, interest represented hereby shall cease to accrue from and after the date fixed for prepayment. Any such notice of redemption may be rescinded by the City as provided in the Trust Agreement.

This Certificate is transferable by the Registered Owner hereof, in person or by his attorney duly authorized in writing, at the corporate trust office of the Trustee in St. Paul, Minnesota, but only in the manner, subject to the limitations and upon payment of the charges, if any, provided in the Trust Agreement and upon surrender and cancellation of this Certificate. Upon such transfer a new Certificate or Certificates, of authorized denomination or denominations, representing the same aggregate principal amount and representing the same rate of interest, will be delivered to the transferee in exchange herefor. The City, the Authority and the Trustee may treat the Registered Owner hereof as the absolute owner hereof for all purposes, whether or not this Certificate shall be overdue, and the City, the Authority and the Trustee shall not be affected by any notice to the contrary.

The Trustee is not required to register the transfer or exchange of any Certificate during the period in which the Trustee is selecting certificates for prepayment or any Certificate selected for prepayment.

To the extent and in the manner permitted by the terms of the Trust Agreement, the provisions of the Trust Agreement may be amended by the parties thereto with the written consent of the owners of a majority in aggregate principal amount of the Certificates then outstanding, and may be amended without such consent under certain circumstances; provided that no such amendment shall extend the fixed maturity of any Certificate or reduce the interest or principal represented thereby, without the express consent of the owner of such Certificate.

The Trustee has no obligation or liability to the owners of the Certificate to make any payment of the interest, principal or premium (if any) represented by the Certificates, other than as provided in the Trust Agreement from the Lease Payments and amounts credited thereto received or held by the Trustee. The recitals herein shall be taken as statements of the Authority and the City and not of the Trustee. The Trustee has executed this Certificate solely in its capacity as Trustee under the Trust Agreement and not in its individual or personal capacity.

Unless this Certificate is presented by an authorized representative of The Depository Trust Company, a New York corporation (“DTC”) to the Trustee for registration of transfer, exchange or payment, and any Certificate executed and delivered is registered in the name of Cede & Co. or such other name as requested by
an authorized representative of DTC (and any payment is made to Cede & Co. or to such other entity as is requested by an authorized representative of DTC), ANY TRANSFER, PLEDGE OR OTHER USE HEREOF FOR VALUE OR OTHERWISE BY OR TO ANY PERSON IS WRONGFUL since the registered owner hereof, Cede & Co., has an interest herein.

IN WITNESS WHEREOF, this Certificate has been executed and delivered by U.S. Bank National Association, as Trustee, acting under the Trust Agreement.

Execution Date: __________

U.S. BANK NATIONAL ASSOCIATION,
as Trustee

By: ________________________________
Authorized Signatory

FORM OF ASSIGNMENT

For value received the undersigned do(es) hereby sell, assign and transfer unto

__________________________________________

(Name, Address and Tax Identification or Social Security Number of Assignee)

the within registered Certificate and hereby irrevocably constitute(s) and appoint(s) _________________________________ attorney, to transfer the same on the registration books of the Trustee with full power of substitution in the premises.

Dated: ________________________________

Signature Guaranteed:

Note: Signature(s) must be guaranteed by an eligible guarantor institution (banks, stockbrokers, saving and loan associations and credit unions with membership in an approved signature medallion program) pursuant to Securities and Exchange Commission Rule 17Ad-15.

Note: The signature(s) on this Assignment must correspond with the name(s) as written on the face of the within Certificate in every particular without alteration or enlargement or any change whatsoever.
ESCROW AGREEMENT

This ESCROW AGREEMENT (this “Agreement”), dated October ___, 2016, is between the CITY OF PACIFICA, a municipal corporation organized and existing under the laws of the State of California (the “City”), and U.S. BANK NATIONAL ASSOCIATION, a national banking association organized and existing under the laws of the United States of America, acting as escrow agent (the “Escrow Agent”).

BACKGROUND:

1. In order to refinance outstanding lease obligations of the City and provide financing for the certain public capital improvements, the City and the City of Pacifica Financing Authority (the “Authority”) have previously entered into a First Amended and Restated Lease Agreement dated as of May 1, 2006, as amended by an Amendment to First Amended and Restated Lease Agreement dated as of August 1, 2008 (collectively, the “2008 Lease”), under which the City is obligated to pay semiannual lease payments (the “2008 Lease Payments”) for the real property leased thereunder.

2. The 2008 Lease Payments are evidenced and represented by the Certificates of Participation (2008 Conversion of 2006 Auction Rate Certificates”) which have been executed and delivered in the aggregate principal amount of $19,815,000 (the “2008 Certificates”) under a Trust Agreement dated as of August 1, 2008 (the “2008 Trust Agreement”), among the City, the Authority and Deutsche Bank National Trust Company, as trustee.

3. U.S. Bank National Association has succeeded to the interests of Deutsche Bank National Trust Company under the 2008 Trust Agreement and, as such, currently serves as trustee for the 2008 Certificates (the “2008 Trustee”).

4. The 2008 Lease Payments and the 2008 Certificates are subject to prepayment on November ___, 2016, at a prepayment price equal to 102% of the principal components to be prepaid, plus accrued interest on such prepaid principal components to the prepayment date, and the City has the right under Section 9.1 of the 2008 Lease to secure the prepayment of the 2008 Lease Payments with an irrevocable deposit of funds with the Escrow Agent.

5. In order to provide funds to prepay the 2008 Lease Payments and the 2008 Certificates in full on November ___, 2016, the City, the Authority and U.S. Bank National Association, as trustee (the “Trustee”) have entered into a Trust Agreement dated as of October 1, 2016 (the “Trust Agreement”), under which the Trustee has executed and delivered 2016 Refunding Certificates of Participation (2008 Certificate Refinancing) in the aggregate principal amount of $________ (the “Certificates”).

6. The City wishes to appoint the Escrow Agent for the purpose of establishing an irrevocable escrow fund to be funded, invested, held and administered for the purpose of providing for the prepayment of the 2008 Lease Payments in full on November ___, 2016.
AGREEMENT:

In consideration of the premises and the material covenants contained herein, the City and the Escrow Agent hereby agree as follows:

SECTION 1. Appointment of Escrow Agent; Establishment of Escrow Fund. The City hereby appoints the Escrow Agent to act as escrow agent for the purpose of administering the funds required to prepay the 2008 Lease Payments in accordance with the 2008 Lease and thereby prepay the 2008 Certificates in accordance with the 2008 Trust Agreement. Such deposit shall constitute a security deposit for the prepayment of the 2008 Lease Payments under and in accordance with the provisions of Section 9.1 of the 2008 Lease, the effect of which shall be to discharge the 2008 Lease Payments in full.

The Escrow Agent is hereby directed to establish an escrow fund (the “Escrow Fund”) to be held by the Escrow Agent in trust as an irrevocable escrow securing the prepayment of the 2008 Lease Payments in accordance with the 2008 Lease and the corresponding prepayment of the 2008 Certificates in accordance with the 2008 Trust Agreement. If at any time the Escrow Agent receives actual knowledge that the cash and securities in the Escrow Fund will not be sufficient to make any payment required by Section 4, the Escrow Agent shall notify the City of such fact and the City shall immediately cure such deficiency by a deposit with the Escrow Agent from any source of legally available funds. The Escrow Agent has no liability for any such insufficiency.

SECTION 2. Deposit of Amounts in Escrow Fund. On October __, 2016, the City shall cause to be transferred to the Escrow Agent for deposit into the Escrow Fund the amount of $___________ in immediately available funds, to be derived from the proceeds of the Certificates. Amounts on deposit in the Escrow Fund shall be applied solely for the uses and purposes set forth in this Agreement.


SECTION 4. Application of Amounts in Escrow Fund. The Escrow Agent shall apply the amounts on deposit in the Escrow Fund to prepay the 2008 Lease Payments and the 2008 Certificates in accordance with the following schedule:

<table>
<thead>
<tr>
<th>Payment Date</th>
<th>Prepaid Principal</th>
<th>Interest Component</th>
<th>Prepayment Premium</th>
<th>Total Payment</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

Following the prepayment of the 2008 Lease Payments and the 2008 Certificates in full on October __, 2016, the Escrow Agent shall transfer any amounts remaining on deposit in the Escrow Fund to the Trustee to be applied to pay interest next coming due and payable with respect to the Certificates.

SECTION 5. Irrevocable Election to Prepay the 2008 Lease Payments. The City hereby irrevocably elects to prepay the 2008 Lease Payments in full on October __, 2016, in accordance with the provisions of Section 9.2 of the 2008 Lease, and further hereby elects to prepay the 2008 Certificates in accordance with the provisions of
Section ___ of the 2008 Trust Agreement. Notice of the prepayment of the 2008 Certificates shall be given by the Escrow Agent, in its capacity as the 2008 Trustee, in accordance with the 2008 Trust Agreement, at the expense of the City.

SECTION 6. Compensation to Escrow Agent. The City shall pay the Escrow Agent full compensation for its services under this Agreement, including out-of-pocket costs such as publication costs, redemption expenses, legal fees and other costs and expenses relating hereto and, in addition, all fees, costs and expenses relating to the purchase, substitution or withdrawal of any securities after the date hereof. Under no circumstances shall amounts deposited in or credited to the Escrow Fund be deemed to be available for said purposes. The Escrow Agent has no lien upon or right of set off against the cash and securities at any time on deposit in the Escrow Fund.

The City shall indemnify, defend and hold harmless the Escrow Agent and its officers, directors, employees, representatives and agents, from and against and reimburse the Escrow Agent for any and all claims, obligations, liabilities, losses, damages, actions, suits, judgments, reasonable costs and expenses (including reasonable attorneys’ and agents’ fees and expenses) of whatever kind or nature regardless of their merit, demanded, asserted or claimed against the Escrow Agent directly or indirectly relating to, or arising from, claims against the Escrow Agent by reason of its participation in the transactions contemplated hereby, except to the extent caused by the Escrow Agent’s gross negligence or willful misconduct. The provisions of this Section shall survive the termination of this Agreement or the earlier resignation or removal of the Escrow Agent.

SECTION 7. Immunities and Liability of Escrow Agent. The Escrow Agent undertakes to perform only such duties as are expressly set forth in this Agreement and no implied duties, covenants or obligations shall be read into this Agreement against the Escrow Agent. The Escrow Agent shall not have any liability hereunder except to the extent of its gross negligence or willful misconduct. In no event shall the Escrow Agent be liable for any special, indirect or consequential damages. The Escrow Agent shall not be liable for any loss from any investment made by it in accordance with the terms of this Agreement. The Escrow Agent may consult with legal counsel of its own choice and the Escrow Agent shall not be liable for the recitals or representations contained in this Agreement and shall not be responsible for the validity of this Agreement, the sufficiency of the Escrow Fund or the moneys and securities to prepay the 2008 Lease Payments.

Whenever in the administration of this Agreement the Escrow Agent deems it necessary or desirable that a matter be proved or established prior to taking or not taking any action, such matter may be deemed to be conclusively proved and established by a certificate of an authorized representative of the City and shall be full protection for any action taken or not taken by the Escrow Agent in good faith reliance thereon.

The Escrow Agent may conclusively rely as to the truth and accuracy of the statements and correctness of any opinions or calculations provided to it in connection with this Agreement and shall be protected in acting, or refraining from acting, upon any notice, instruction, request, certificate, document, opinion or other writing furnished to the Escrow Agent in connection with this Agreement and believed by the Escrow Agent
to be signed by the proper party, and it need not investigate any fact or matter stated therein.

None of the provisions of this Agreement shall require the Escrow Agent to expend or risk its own funds or otherwise to incur any liability, financial or otherwise, in the performance of any of its duties hereunder. The Escrow Agent may execute any of the powers hereunder or perform any duties hereunder either directly or by or through agents, attorneys, custodians or nominees appointed with due care, and shall not be responsible for any willful misconduct or negligence on the part of any agent, attorney, custodian or nominee so appointed. The Escrow Agent shall not be liable to the parties hereto or deemed in breach or default hereunder if and to the extent its performance hereunder is prevented by reason of force majeure. The term “force majeure” means an occurrence that is beyond the control of the Escrow Agent and could not have been avoided by exercising due care. Force majeure shall include acts of God, terrorism, war, riots, strikes, fire, floods, earthquakes, epidemics or other similar occurrences.

SECTION 8. Resignation; Appointment of Successor. The Escrow Agent may at any time resign by giving 30 days written notice of resignation to the City. Upon receiving such notice of resignation, the City shall promptly appoint a successor and, upon the acceptance by the successor of such appointment, release the resigning Escrow Agent from its obligations hereunder by written instrument, a copy of which instrument shall be delivered to each of the City, the resigning Escrow Agent and the successor. If no successor shall have been so appointed and have accepted appointment within 30 days after the giving of such notice of resignation, the resigning Escrow Agent may petition any court of competent jurisdiction, at the expense of the City, for the appointment of a successor.

Any bank, corporation or association into which the Escrow Agent may be merged or converted or with which it may be consolidated, or any bank, corporation or association resulting from any merger, conversion or consolidation to which the Escrow Agent shall be a party, or any bank, corporation or association succeeding to all or substantially all of the corporate agency business of the Escrow Agent shall be the successor of the Escrow Agent hereunder without the execution or filing of any paper with any party hereto or any further act on the part of any of the parties hereto except on the part of any of the parties hereto where an instrument of transfer or assignment is required by law to effect such succession, anything herein to the contrary notwithstanding.

SECTION 9. Communications. The Escrow Agent agrees to accept and act upon instructions or directions pursuant to this Agreement sent by unsecured e-mail, facsimile transmission or other similar unsecured electronic methods, provided, however, that, the Escrow Agent shall have received an incumbency certificate listing persons designated to give such instructions or directions and containing specimen signatures of such designated persons, which such incumbency certificate shall be amended and replaced whenever a person is to be added or deleted from the listing. If the City elects to give the Escrow Agent e-mail or facsimile instructions (or instructions by a similar electronic method) and the Escrow Agent in its discretion elects to act upon such instructions, the Escrow Agent’s understanding of such instructions shall be deemed controlling. The Escrow Agent shall not be liable for any losses, costs or expenses arising directly or indirectly from the Escrow Agent’s reliance upon and compliance with such instructions notwithstanding such instructions conflict or are inconsistent with a subsequent written
instruction. The City agrees to assume all risks arising out of the use of such electronic methods to submit instructions and directions to the Escrow Agent, including without limitation the risk of the Escrow Agent acting on unauthorized instructions, and the risk of interception and misuse by third parties.

SECTION 10. Termination of Agreement. Upon prepayment in full of the 2008 Lease Payments, and upon payment of all fees, expenses and charges of the Escrow Agent as described above, this Agreement shall terminate and the Escrow Agent shall be discharged from any further obligation or responsibility hereunder.

SECTION 11. Applicable Law. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

CITY OF PACIFICA

By: ____________________________
    City Manager

U.S. BANK NATIONAL ASSOCIATION,

as Escrow Agent

By: ____________________________
    Authorized Officer
AMENDED AND RESTATED LEASE AGREEMENT

Dated as of October 1, 2016

between the

CITY OF PACIFICA FINANCING AUTHORITY
as lessor

and the

CITY OF PACIFICA
as lessee

Relating to

$________
2016 Refunding Certificates of Participation
(2008 Certificate Refinancing)
AMENDED AND RESTATED LEASE AGREEMENT

This AMENDED AND RESTATED LEASE AGREEMENT (this “Lease”), dated as of October 1, 2016, is between the CITY OF PACIFICA FINANCING AUTHORITY, a joint exercise of powers agency duly organized and existing under the laws of the State of California (the “Authority”), and the CITY OF PACIFICA, a municipal corporation duly organized and existing under the laws of the State of California (the “City”).

BACKGROUND:

1. In order to refinance outstanding lease obligations of the City and provide financing for certain public capital improvements, the City and the Authority have previously entered into a First Amended and Restated Site Lease dated as of May 1, 2006, which was recorded on May 15, 2006, as Instrument No. 2006-072697 of the Official Records of the San Mateo County Recorder’s Office, as amended by a Second Amendment and Restated Site Lease dated as of August 1, 2008, which was recorded on August 1, 2008, as Instrument No. 2008-089105 of the Official Records of the San Mateo County Recorder’s Office (collectively, the “2006 Site Lease”), under which the City has leased certain real property consisting of the land and buildings comprising a Public Safety Building located at 2705 Coast Highway in the City, and a Community Center located at Coast Highway and Crespi Drive in the City, as described more fully in Appendix A attached to the 2006 Site Lease, and the Authority has leased such real property back to the City under a First Amended and Restated Lease Agreement dated as of May 1, 2006, which was recorded on May 15, 2006, as Instrument No. 2006-072698 of the Official Records of the San Mateo County Recorder’s Office, as amended by an Amendment to First Amended and Restated Lease Agreement dated as of August 1, 2008, which was recorded on August 1, 2008, as Instrument No. 2008-089104 of the Official Records of the San Mateo County Recorder’s Office (collectively, the “2008 Lease Agreement”).

2. Under the 2008 Lease Agreement, the City is obligated to pay semiannual lease payments (the “2008 Lease Payments”) to the Authority as the rental of the real property which is leased thereunder, and the 2008 Lease Payments are evidenced and represented by the Certificates of Participation (2008 Conversion of 2006 Auction Rate Certificates) which have been executed and delivered in the aggregate original principal amount of $19,815,000 (the “2008 Certificates”), under a Trust Agreement dated as of August 1, 2008, among the City, the Authority and Deutsche Bank National Trust Company, as trustee.

3. The 2008 Lease Payments and the 2008 Certificates are subject to prepayment on any date at a prepayment price equal to 102% of the principal components of the 2008 Lease Payments to be prepaid, plus accrued interest on such prepaid principal components to the prepayment date.

4. In order to provide funds to refinance the 2008 Lease Payments and the 2008 Certificates and thereby realize debt service savings, the City and the Authority have amended and restated the 2006 Site Lease under an Amended and Restated Site
Lease dated as of October 1, 2016 (the “Site Lease”), which has been recorded concurrently herewith, and the City and the Authority have further proposed to amend and restate the 2008 Lease for the purpose, among others, of substituting a portion of the real property which is leased thereunder and obligating the City to pay a reduced amount of semiannual lease payments (the “Lease Payments”) therefor.

5. The Authority has agreed to assign its right to receive the Lease Payments to U.S. Bank National Association, as trustee (the “Trustee”), and in consideration of such assignment the Trustee has agreed to execute and deliver 2016 Refunding Certificates of Participation (2008 Certificate Refinancing) in the aggregate principal amount of $__________ (the “Certificates”), each evidencing a direct, undivided fractional interest in the Lease Payments, under a Trust Agreement dated as of October 1, 2016 (the “Trust Agreement”), among the Authority, the City and the Trustee.

6. A portion of the 2008 Lease Payments which is allocable to the refunding of the Certificates of Participation (1999 Street Improvement Program) which were delivered in the original principal amount of $5,000,000 (the “1999 Certificates”) is payable from received by the City from the revenues derived from taxes imposed on the purchase of motor vehicle fuels, and a corresponding portion of the Lease Payments is also be payable from such revenues.

7. The Authority has been organized for the purpose of providing financial assistance to the City and is authorized to enter into financing documents for that purpose.

Agreement:

In consideration of the foregoing and the material covenants hereinafter contained, the City and the Authority formally covenant, agree and bind themselves as follows:

Article I

Definitions; Rules of Interpretation

Section 1.1. Definitions. Unless the context clearly otherwise requires or unless otherwise defined herein, the capitalized terms in this Lease have the respective meanings specified in the recitals hereof and in Appendix A to the Trust Agreement. Any capitalized terms which are defined in the recitals of this Lease and not otherwise defined herein shall have the respective meanings given such terms in the recitals.

Section 1.2. Interpretation.

(a) Unless the context otherwise indicates, words expressed in the singular include the plural and vice versa and the use of the neuter, masculine, or feminine gender is for convenience only and include the neuter, masculine or feminine gender, as appropriate.
(b) Headings of articles and sections herein and the table of contents hereof are solely for convenience of reference, do not constitute a part hereof and do not affect the meaning, construction or effect hereof.

(c) All references herein to “Articles,” “Sections” and other subdivisions are to the corresponding Articles, Sections or subdivisions of this Lease; the words “herein,” “hereof,” “hereby,” “hereunder” and other words of similar import refer to this Lease as a whole and not to any particular Article, Section or subdivision hereof.

ARTICLE II
COVENANTS, REPRESENTATIONS AND WARRANTIES

SECTION 2.1. Covenants, Representations and Warranties of the City. The Authority makes the following covenants, representations and warranties to the City as of the Closing Date:

(a) Due Organization and Existence. The City is a municipal corporation duly organized and validly existing under the laws of the State of California, has full legal right, power and authority under the laws of the State of California to enter into this Lease, the Site Lease and the Trust Agreement and to carry out and consummate all transactions contemplated hereby and thereby, and by proper action the City has duly authorized the execution and delivery of this Lease, the Site Lease and the Trust Agreement.

(b) Due Execution. The representatives of the City executing this Lease, the Site Lease and the Trust Agreement have been fully authorized to execute the same under a resolution duly adopted by the City Council of the City.

(c) Valid, Binding and Enforceable Obligations. This Lease, the Site Lease and the Trust Agreement have been duly authorized, executed and delivered by the City and constitute the legal, valid and binding agreements of the City enforceable against the City in accordance with their respective terms.

(d) No Conflicts. The execution and delivery of this Lease, the Site Lease and the Trust Agreement, the consummation of the transactions herein and therein contemplated and the fulfillment of or compliance with the terms and conditions hereof, do not and will not conflict with or constitute a violation or breach of or default (with due notice or the passage of time or both) under any applicable law or administrative rule or regulation, or any applicable court or administrative decree or order, or any indenture, mortgage, deed of trust, lease, contract or other agreement or instrument to which the City is a party or by which it or its properties are otherwise subject or bound, or result in the creation or imposition of any prohibited lien, charge or encumbrance of any nature whatsoever upon any of the
property or assets of the City, which conflict, violation, breach, default, lien, charge or encumbrance would have consequences that would materially and adversely affect the consummation of the transactions contemplated by this Lease, the Site Lease and the Trust Agreement or the financial condition, assets, properties or operations of the City.

(e) Consents and Approvals. No consent or approval of any trustee or holder of any indebtedness of the City or of the voters of the City, and no consent, permission, authorization, order or license of, or filing or registration with, any governmental authority is necessary in connection with the execution and delivery of this Lease, the Site Lease and the Trust Agreement, or the consummation of any transaction herein or therein contemplated, except as have been obtained or made and as are in full force and effect.

(f) No Litigation. There is no action, suit, proceeding, inquiry or investigation before or by any court or federal, state, municipal or other governmental authority pending or, to the knowledge of the City after reasonable investigation, threatened against or affecting the City or the assets, properties or operations of the City which, if determined adversely to the City or its interests, would have a material and adverse effect upon the consummation of the transactions contemplated by or the validity of this Lease, the Site Lease or the Trust Agreement, or upon the financial condition, assets, properties or operations of the City, and the City is not in default with respect to any order or decree of any court or any order, regulation or demand of any federal, state, municipal or other governmental authority, which default might have consequences that would materially and adversely affect the consummation of the transactions contemplated by this Lease, the Site Lease or the Trust Agreement or the financial conditions, assets, properties or operations of the City.

SECTION 2.2. Covenants, Representations and Warranties of the Authority. The Authority makes the following covenants, representations and warranties to the City as of the Closing Date:

(a) Due Organization and Existence. The Authority is a joint exercise of powers agency duly organized and existing under the laws of the State of California, has full legal right, power and authority to enter into this Lease, the Site Lease, the Trust Agreement and the Assignment Agreement and to carry out and consummate all transactions contemplated hereby and thereby, and by proper action the Authority has duly authorized the execution and delivery of this Lease, the Site Lease, the Trust Agreement and the Assignment Agreement.

(b) Maintenance of Existence. The Authority shall maintain its existence as a joint exercise of powers agency duly organized and
existing under the laws of the State of California at all times during the Term hereof.

(c) Due Execution. The representatives of the Authority executing this Lease, the Site Lease, the Trust Agreement and the Assignment Agreement are fully authorized to execute the same under official action taken by the Board of Directors of the Authority.

(d) Valid, Binding and Enforceable Obligations. This Lease, the Site Lease, the Trust Agreement and the Assignment Agreement have been duly authorized, executed and delivered by the Authority and constitute the legal, valid and binding agreements of the Authority, enforceable against the Authority in accordance with their respective terms.

(e) No Conflicts. The execution and delivery of this Lease, the Site Lease, the Trust Agreement and the Assignment Agreement, the consummation of the transactions herein and therein contemplated and the fulfillment of or compliance with the terms and conditions hereof, do not and will not conflict with or constitute a violation or breach of or default (with due notice or the passage of time or both) under any applicable law or administrative rule or regulation, or any applicable court or administrative decree or order, or any indenture, mortgage, deed of trust, lease, contract or other agreement or instrument to which the Authority is a party or by which it or its properties are otherwise subject or bound, or result in the creation or imposition of any prohibited lien, charge or encumbrance of any nature whatsoever upon any of the property or assets of the Authority, which conflict, violation, breach, default, lien, charge or encumbrance would have consequences that would materially and adversely affect the consummation of the transactions contemplated by this Lease, the Site Lease, the Trust Agreement and the Assignment Agreement or the financial condition, assets, properties or operations of the Authority.

(f) Consents and Approvals. No consent or approval of any trustee or holder of any indebtedness of the Authority, and no consent, permission, authorization, order or license of, or filing or registration with, any governmental authority is necessary in connection with the execution and delivery of this Lease, the Site Lease, the Trust Agreement or the Assignment Agreement, or the consummation of any transaction herein or therein contemplated, except as have been obtained or made and as are in full force and effect.

(g) No Litigation. There is no action, suit, proceeding, inquiry or investigation before or by any court or federal, state, municipal or other governmental authority pending or, to the knowledge of the Authority after reasonable investigation, threatened against or affecting the Authority or the assets, properties or operations of the Authority which, if determined adversely to the Authority or its interests, would have a material and adverse effect upon the
consummation of the transactions contemplated by or the validity of this Lease, the Site Lease, the Trust Agreement or the Assignment Agreement, or upon the financial condition, assets, properties or operations of the Authority, and the Authority is not in default with respect to any order or decree of any court or any order, regulation or demand of any federal, state, municipal or other governmental authority, which default might have consequences that would materially and adversely affect the consummation of the transactions contemplated by this Lease, the Site Lease, the Trust Agreement or the Assignment Agreement or the financial conditions, assets, properties or operations of the Authority.

ARTICLE III

LEASE PAYMENTS;
SUBSTITUTION AND RELEASE OF PROPERTY

SECTION 3.1. Restatement of 2008 Lease; Lease of Leased Property. This Lease constitutes an amendment and restatement in full of the 2008 Lease. From and after the Closing Date, the 2008 Lease, in the form heretofore executed and delivered by the City and the Authority, will be of no further force and effect and will be deemed to be restated in full hereby. The Authority continues to and does hereby lease the real property which is described more fully in Appendix A hereto to the City, upon the terms and conditions set forth in this Lease, without interruption by virtue of the amendment and restatement of the 2008 Lease hereby. The City and the Authority acknowledge and agree that the Leased Property includes a portion but not all of the real property which was originally leased under the 2008 Lease, together with additional real property which was not originally leased under the 2008 Lease. The City and the Authority shall cause to be executed, delivered and recorded all documentation, and take all actions, as shall be required to release from the 2008 Lease all real property which was originally leased thereunder and which is not described in Appendix A hereto.

SECTION 3.2. Term. The Term of this Lease commences on the date of execution and delivery hereof and ends on the date on which the Trust Agreement is discharged under Section 13.01 thereof, but under any circumstances not later than January 1, 2047. The provisions of this Section are subject to the provisions of Section 3.6 relating to the substitution of property, the provisions of Section 3.7 relating to the release of property, and the provisions of Section 5.2 relating to the taking in eminent domain of the Leased Property or any portion thereof. Notwithstanding the foregoing provisions of this Section, the City may not terminate this Lease as a remedy for a default by the Authority.

SECTION 3.3. Lease Payments.

(a) Obligation to Pay. Subject to the provisions of Sections 5.2 and 5.3 and the provisions of Article VIII, the City will pay to the Authority, its successors and assigns, the Lease Payments (denominated into components of principal and interest) in the respective amounts specified in Appendix B hereto, to be due and payable in immediately available funds on the Interest Payment Dates immediately following each
of the respective Lease Payment Dates specified in Appendix B, and to be deposited by
the City with the Trustee on each of the Lease Payment Dates specified in Appendix B.
Any amount held in the Lease Payment Fund on any Lease Payment Date (other than
amounts resulting from the prepayment of the Lease Payments in part but not in whole
under Article VIII and other than amounts required for payment of past due principal or
interest represented by any Certificates not presented for payment) will be credited
towards the Lease Payment then required to be paid; and no Lease Payment need be
deposited with the Trustee on any Lease Payment Date if the amounts then held in the
Lease Payment Fund are at least equal to the Lease Payment then required to be
deposited with the Trustee. The Lease Payments payable in any Rental Period are for
the use of the Leased Property during such Rental Period.

(b) Effect of Prepayment. If the City prepays all Lease Payments in full under
Sections 8.2 or 8.3, and if the City has paid all Additional Payments then due and
payable, the City’s obligations under this Section will thereupon cease and terminate. If
the City prepays the Lease Payments in part but not in whole under Sections 8.2 or 8.3,
the principal components of the remaining Lease Payments will be reduced in integral
multiples of $5,000 among Lease Payment Dates on a basis which corresponds to the
principal maturities of the Certificates which are prepaid thereby; and the interest
component of each remaining Lease Payment will be reduced by the aggregate
corresponding amount of interest which would otherwise be payable with respect to the
Certificates thereby prepaid under the corresponding provisions of Section 3.01 of the
Trust Agreement.

(c) Rate on Overdue Payments. If the City fails to make any of the payments
required in this Section, the payment in default will continue as an obligation of the City
until the amount in default has been fully paid, and the City agrees to pay the same with
interest thereon, from the date of default to the date of payment at the highest rate of
interest represented by any Outstanding Certificate.

(d) Fair Rental Value. The Lease Payments and Additional Payments coming
due and payable during each Rental Period constitute the total rental for the Leased
Property for such Rental Period, and the City will pay the Lease Payments and
Additional Payments in each Rental Period for and in consideration of the right of the
use and occupancy of, and the continued quiet use and enjoyment of the Leased
Property during each Rental Period. The Authority and the City have agreed and
determined that the total Lease Payments and the Additional Payments represent the
fair rental value of the Leased Property. In making such determination, consideration
has been given to the estimated value of the Leased Property as of the Closing Date,
other obligations of the City and the Authority under this Lease, the uses and purposes
which may be served by the Leased Property and the benefits therefrom which will
accrue to the City and the general public.

(e) Assignment. The City acknowledges that all Lease Payments have been
assigned by the Authority to the Trustee in trust under the Assignment Agreement, for
the benefit of the Owners of the Certificates, and the City consents to such assignment.
The Authority directs the City, and the City agrees to pay to the Trustee at its Office, all
payments payable by the City under this Section and all amounts payable by the City
under Article VIII.
SECTION 3.3. *Additional Payments.* In addition to the Lease Payments, the City shall pay when due, as additional rental for the Leased Property hereunder, all costs and expenses incurred by the City hereunder or under the Trust Agreement, or incurred by the Authority to comply with the provisions of the Trust Agreement, including without limitation all Costs of Issuance (to the extent not paid from amounts on deposit in the Costs of Issuance Fund), annual compensation due to the Trustee and all of its reasonable costs and expenses (including amounts payable to the Trustee by virtue of indemnification) payable as a result of the performance of and compliance with its duties under the Trust Agreement, and all reasonable costs and expenses of attorneys, auditors, engineers and accountants engaged by the Authority or the Trustee in connection with the Leased Property or the performance of their duties hereunder or under the Trust Agreement.

SECTION 3.4. *Source of Payments.* The Lease Payments and the Additional Payments are payable from any source of available funds of the City, subject to the provisions of Articles V and VIII.

The City covenants to take such action as may be necessary to include all estimated Lease Payments and Additional Payments due hereunder in each of its final approved budgets. The City further covenants to make all necessary appropriations (including any supplemental appropriations) from any source of legally available funds of the City for all the actual amount of Lease Payments and Additional Payments which come due and payable during the period covered by each such budget. The covenants on the part of the City contained herein shall be duties imposed by law and shall be the duty of each and every public official of the City to take such action and do such things as are required by law in the performance of the official duty of such officials to enable the City to carry out and perform the covenants and agreements in this Lease agreed to be carried out and performed by the City.

SECTION 3.5. *Title.* At all times during the Term of this Lease, the City will hold title to the Leased Property, subject to the Site Lease and other Permitted Encumbrances, including all additions which comprise fixtures, repairs, replacements or modifications thereto, and subject to the provisions of Section 4.2.

Upon the termination of this Lease (other than under Section 7.2(b) hereof), all right, title and interest of the Authority in and to the Leased Property will be transferred to and vested in the City. Upon the payment in full of all Lease Payments allocable to the Leased Property, or upon the deposit by the City of security for such Lease Payments as provided in Section 8.1, all right, title and interest of the Authority in and to the Leased Property will be transferred to and vested in the City. The Authority agrees to take any and all steps and execute and record any and all documents reasonably required by the City to consummate any such transfer of title.

SECTION 3.6. *Substitution of Property.* The City has the option at any time and from time to time to substitute other real property (the “Substitute Property”) for the Leased Property or any portion thereof (the “Former Property”), provided that the City shall satisfy all of the following requirements which are hereby declared to be conditions precedent to such substitution:

(a) No Event of Default has occurred and is continuing.
(b) The City has filed with the Authority and the Trustee, and caused to be recorded in the office of the San Mateo County Recorder sufficient memorialization of, an amendment hereof which adds to Appendix A hereto a description of such Substitute Property and deletes therefrom the description of such Former Property.

(c) The City has obtained a CLTA policy of title insurance which insures the City’s leasehold estate hereunder in such Substitute Property, subject only to Permitted Encumbrances, in an amount at least equal to the estimated value thereof;

(d) The City has certified in writing to the Authority and the Trustee that such Substitute Property serves the municipal purposes of the City and constitutes property which the City is permitted to lease under the laws of the State of California, and has been determined to be essential to the proper, efficient and economic operation of the City and to serve an essential governmental function of the City.

(e) The Substitute Property does not cause the City to violate any of its covenants, representations and warranties made herein or in the Trust Agreement.

(f) The City has filed with the Authority and the Trustee an appraisal or other written documentation which establishes that the estimated value and the fair rental value of the Substitute Property are at least equal to the estimated value and the fair rental value, respectively, of the Former Property, and that the useful life of the Substitute Property at least equals the lesser of (i) the useful life of the Former Property, or (ii) the final Lease Payment Date of the Lease Payments.

(g) The City has mailed written notice of such substitution to each rating agency which then maintains a rating on the Certificates.

Upon the satisfaction of all such conditions precedent, the Term of this Lease will thereupon end as to the Former Property and commence as to the Substitute Property, and all references to the Former Property will apply with full force and effect to the Substitute Property. The City is not entitled to any reduction, diminution, extension or other modification of the Lease Payments whatsoever as a result of such substitution. The Authority and the City will execute, deliver and cause to be recorded all documents required to discharge this Lease against the Former Property.

SECTION 3.7. Release of Property. The City has the option at any time and from time to time to release any portion of the Leased Property from this Lease and the Site Lease (the “Released Property”) provided that the City has satisfied all of the following requirements which are hereby declared to be conditions precedent to such release:

(a) No Event of Default has occurred and is continuing.

(b) The City has filed with the Authority and the Trustee, and caused to be recorded in the office of the San Mateo County Recorder
sufficient memorialization of, an amendment hereof which removes the Released Property from this Lease and the Site Lease.

(c) The City has certified in writing to the Authority and the Trustee that the estimated value of the property which remains subject to this Lease and the Site Lease following such release is at least equal to the aggregate original principal amount of the Certificates, and the fair rental value of the property which remains subject to this Lease and the Site Lease following such release is at least equal to the Lease Payments thereafter coming due and payable hereunder.

(d) The City has mailed written notice of such release to each rating agency which then maintains a rating on the Certificates.

Upon the satisfaction of all such conditions precedent, the Term of this Lease will thereupon end as to the Released Property. The City is not entitled to any reduction, diminution, extension or other modification of the Lease Payments whatsoever as a result of such release. The Authority and the City shall execute, deliver and cause to be recorded all documents required to discharge this Lease and the Site Lease of record against the Released Property.

SECTION 3.8. No Merger. It is the express intention of the Authority and the City that this Lease and the obligations of the parties hereunder are separate and distinct from the Site Lease and the obligations of the parties thereunder, and that during the term of the Site Lease and this Lease no merger of title or interest may occur or be deemed to occur as a result of the respective positions of the Authority and the City thereunder and hereunder.

ARTICLE IV
MAINTENANCE, TAXES, INSURANCE AND OTHER MATTERS

SECTION 4.1. Maintenance, Utilities, Taxes and Assessments. Throughout the Term of this Lease, as part of the consideration for the rental of the Leased Property, all improvement, repair and maintenance of the Leased Property are the sole responsibility of the City, and the City will pay for or otherwise arrange for the payment of all utility services supplied to the Leased Property, which may include, without limitation, janitor service, security, power, gas, telephone, light, heating, water and all other utility services, and shall pay for or otherwise arrange for the payment of the cost of the repair and replacement of the Leased Property resulting from ordinary wear and tear or want of care on the part of the City or any assignee or sublessee thereof. In exchange for the Lease Payments herein provided, the Authority agrees to provide only the Leased Property, as hereinbefore more specifically set forth. The City waives the benefits of subsections 1 and 2 of Section 1932, Section 1933(4) and Sections 1941 and 1942 of the California Civil Code, but such waiver does not limit any of the rights of the City under the terms of this Lease.
The City will also pay or cause to be paid all taxes and assessments of any type or nature, if any, charged to the Authority or the City affecting the Leased Property or the respective interests or estates therein; provided that with respect to special assessments or other governmental charges that may lawfully be paid in installments over a period of years, the City is obligated to pay only such installments as are required to be paid during the Term of this Lease as and when the same become due.

The City may, at the City’s expense and in its name, in good faith contest any such taxes, assessments, utility and other charges and, in the event of any such contest, may permit the taxes, assessments or other charges so contested to remain unpaid during the period of such contest and any appeal therefrom unless the Authority notifies the City that, in its reasonable opinion, by nonpayment of any such items the interest of the Authority in the Leased Property will be materially endangered or the Leased Property or any part thereof will be subject to loss or forfeiture, in which event the City shall promptly pay such taxes, assessments or charges or provide the Authority with full security against any loss which may result from nonpayment, in form satisfactory to the Authority and the Trustee.

SECTION 4.2. Modification of Leased Property. The City has the right, at its own expense, to make additions, modifications and improvements to the Leased Property or any portion thereof. All additions, modifications and improvements to the Leased Property will thereafter comprise part of the Leased Property and become subject to the provisions of this Lease. Such additions, modifications and improvements may not in any way damage the Leased Property, or cause the Leased Property to be used for purposes other than those authorized under the provisions of state and federal law; and the Leased Property, upon completion of any additions, modifications and improvements made thereto under this Section, shall be of a value which is not substantially less than the value thereof immediately prior to the making of such additions, modifications and improvements. The City will not permit any mechanic’s or other lien to be established or remain against the Leased Property for labor or materials furnished in connection with any remodeling, additions, modifications, improvements, repairs, renewals or replacements made by the City under this Section; provided that if any such lien is established and the City first notifies the Authority of the City’s intention to do so, the City may in good faith contest any lien filed or established against the Leased Property, and in such event may permit the items so contested to remain undischarged and unsatisfied during the period of such contest and any appeal therefrom and shall provide the Authority with full security against any loss or forfeiture which might arise from the nonpayment of any such item, in form satisfactory to the Authority. The Authority will cooperate fully in any such contest, upon the request and at the expense of the City.

SECTION 4.3. Public Liability and Property Damage Insurance. The City will maintain or cause to be maintained, throughout the Term of this Lease, comprehensive general insurance in protection of the Authority, the City and their respective members, officers, agents, employees and assigns. Such insurance shall provide for indemnification of said parties against direct or contingent loss or liability for damages for bodily and personal injury, death or property damage occasioned by reason of the operation of the Leased Property. Such insurance shall provide coverage in such liability limits and be subject to such deductibles as the City deems adequate and prudent. Such insurance may be maintained as part of or in conjunction with any other insurance coverage carried by the City, and may be maintained in whole or in part in the form of a program of self-insurance by the City, or in the form of the participation by the
City in a joint powers authority or other program providing pooled insurance. The City shall apply the proceeds of such insurance toward extinguishment or satisfaction of the liability with respect to which the net proceeds are paid.

**SECTION 4.4. Casualty Insurance.** The City will procure and maintain, or cause to be procured and maintained, at all times throughout the Term of this Lease, casualty insurance against loss or damage to the insured buildings, facilities and other improvements constituting any part of the Leased Property, in an amount at least equal to the lesser of (a) the replacement value of such buildings, facilities and improvements, or (b) the aggregate principal amount of the Outstanding Certificates. Such insurance shall, as nearly as practicable, cover loss or damage by fire, explosion, windstorm, riot, aircraft, vehicle damage, smoke and such other hazards as are normally covered by such insurance, and shall include earthquake coverage if such coverage is available at reasonable cost from reputable insurers in the reasonable determination of the City, whose determination is final and conclusive. Such insurance may be subject to such deductibles as the City deems prudent. Such insurance may be maintained as part of or in conjunction with any other insurance coverage carried by the City, and may be maintained in whole or in part in the form of the participation by the City in a joint powers authority or other program providing pooled insurance; provided that such insurance may not be maintained by the City in the form of self-insurance. The City shall apply the Net Proceeds of such insurance as provided in Section 5.1.

**SECTION 4.5. Rental Interruption Insurance.** The City will procure and maintain, or cause to be procured and maintained, at all times throughout the Term of this Lease, rental interruption or use and occupancy insurance to cover loss, total or partial, of the use of the buildings, facilities and other improvements constituting any part of the Leased Property, as a result of any of the hazards covered in the insurance required by Section 4.4, in an amount at least equal to the maximum Lease Payments coming due and payable during any two consecutive Fiscal Years during the remaining Term of this Lease. Such insurance may be maintained as part of or in conjunction with any other insurance coverage carried by the City, and may be maintained in whole or in part in the form of the participation by the City in a joint powers authority or other program providing pooled insurance; provided that such insurance may not be maintained by the City in the form of self-insurance. The Net Proceeds of such insurance, if any, shall be paid to the Trustee and deposited in the Lease Payment Fund, and shall be credited towards the payment of the Lease Payments allocable to the insured improvements as the same become due and payable.

**SECTION 4.6. Recordation Hereof; Title Insurance.** The City will, at its expense, cause the Site Lease, the Assignment Agreement and this Lease to be recorded in the office of the San Mateo County Recorder on or before the Closing Date. Concurrent with such recordation, the City shall obtain a CLTA title insurance policy insuring the City’s leasehold estate in the Leased Property hereunder, in an amount at least equal to the aggregate principal amount of the Certificates. All Net Proceeds received under such title insurance policy will be deposited with the Trustee in the Lease Payment Fund and credited towards the prepayment of the Lease Payments under Section 8.3.

**SECTION 4.7. Insurance Net Proceeds; Form of Policies.** Each policy of insurance maintained under Sections 4.4, 4.5 and 4.6 shall name the Trustee as loss payee so as to provide that all proceeds thereunder are payable to the Trustee. The City shall pay or cause to be paid when due the premiums for all insurance policies.
required by this Lease. All such policies shall provide that the Trustee is given 30 days’ notice of each expiration, any intended cancellation thereof or reduction of the coverage provided thereby. The Trustee is not responsible for the sufficiency, adequacy or amount of any insurance or self-insurance herein required and is fully protected in accepting payment on account of such insurance or any adjustment, compromise or settlement of any loss.

SECTION 4.8. Installation of City’s Personal Property. The City may at any time and from time to time, in its sole discretion and at its own expense, install or permit to be installed other items of equipment or other personal property in or upon the Leased Property. All such items will remain the sole property of the City, in which neither the Authority nor the Trustee has any interest, and may be modified or removed by the City at any time, provided that the City shall repair and restore any and all damage to the Leased Property resulting from the installation, modification or removal of any such items. Nothing in this Lease prevents the City from purchasing or leasing items to be installed under this Section under a lease or conditional sale agreement, or subject to a vendor’s lien or security agreement, as security for the unpaid portion of the purchase price thereof, provided that no such lien or security interest attaches to any part of the Leased Property.

SECTION 4.9. Liens. The City may not, directly or indirectly, create, incur, assume or suffer to exist any mortgage, pledge, lien, charge, encumbrance or claim on or with respect to the Leased Property, other than as herein contemplated and except for such encumbrances as the City certifies in writing to the Trustee do not materially and adversely affect the leasehold estate in the Leased Property hereunder. Except as expressly provided in this Article, the City will promptly, at its own expense, take such action as may be necessary to duly discharge or remove any such mortgage, pledge, lien, charge, encumbrance or claim, for which it is responsible, if the same shall arise at any time. The City will reimburse the Authority for any expense incurred by it in order to discharge or remove any such mortgage, pledge, lien, charge, encumbrance or claim.

SECTION 4.10. Advances. If the City fails to perform any of its obligations under this Article, the Authority may take any necessary action to cure the failure, including the advancement of money, and the City shall repay all such advances as additional rental hereunder, with interest at the rate set forth in Section 3.3(c).
ARTICLE V

DAMAGE, DESTRUCTION AND EMINENT DOMAIN;
USE OF NET PROCEEDS

SECTION 5.1. Application of Net Proceeds. The Net Proceeds of any insurance award resulting from any damage to or destruction of the Leased Property by fire or other casualty shall be paid to the Trustee, as assignee of the Authority under the Assignment Agreement, and deposited in the Insurance and Condemnation Fund to be applied as set forth in Section 6.01 of the Trust Agreement. The City shall pay the Net Proceeds of any eminent domain award with respect to the Leased Property resulting from an event described in Section 5.2 to the Trustee for deposit in the Insurance and Condemnation Fund, to be applied as set forth in Section 6.02 of the Trust Agreement.

SECTION 5.2. Termination or Abatement Due to Eminent Domain. If the Leased Property is taken permanently under the power of eminent domain or sold to a government threatening to exercise the power of eminent domain, the Term of this Lease will cease with respect thereto as of the day possession is so taken. If less than all of the Leased Property is taken permanently, or if the Leased Property is taken temporarily, under the power of eminent domain, (a) this Lease will continue in full force and effect with respect thereto and will not be terminated by virtue of such taking and the parties waive the benefit of any law to the contrary, and (b) there will be a partial abatement of Lease Payments allocated thereto, in an amount to be determined by the City such that the resulting Lease Payments represent fair consideration for the use and occupancy of the remaining usable portions of the Leased Property. Notwithstanding the foregoing, the Lease Payments will not be abated under this Section to the extent that the proceeds of eminent domain proceedings are available to pay Lease Payments which would otherwise be abated under this Section, it being hereby declared that such proceeds and amounts constitute a special fund for the payment of the Lease Payments.

SECTION 5.3. Abatement Due to Damage or Destruction. The amount of Lease Payments will be abated during any period in which by reason of damage or destruction (other than by eminent domain which is hereinbefore provided for) there is substantial interference with the use and occupancy by the City of the Leased Property or any portion thereof. The amount of such abatement shall be determined by the City such that the resulting Lease Payments represent fair consideration for the use and occupancy of the portions of the Leased Property not damaged or destroyed. Such abatement shall continue for the period commencing with such damage or destruction and ending with the substantial completion of the work of repair or reconstruction. In the event of any such damage or destruction, this Lease shall continue in full force and effect and the City waives any right to terminate this Lease by virtue of any such damage and destruction. Notwithstanding the foregoing, there shall be no abatement of Lease Payments under this Section to the extent that the proceeds of hazard insurance or rental interruption insurance are available to pay Lease Payments which would otherwise be abated under this Section, it being hereby declared that such proceeds and amounts constitute a special fund for the payment of the Lease Payments.
ARTICLE VI

OTHER COVENANTS

SECTION 6.1. Disclaimer of Warranties. THE AUTHORITY MAKES NO AGREEMENT, WARRANTY OR REPRESENTATION, EITHER EXPRESS OR IMPLIED, AS TO THE VALUE, DESIGN, CONDITION, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR FITNESS FOR THE USE CONTEMPLATED BY THE CITY OF THE LEASED PROPERTY OR ANY PORTION THEREOF, OR ANY OTHER REPRESENTATION OR WARRANTY WITH RESPECT TO THE LEASED PROPERTY OR ANY PORTION THEREOF. THE CITY ACKNOWLEDGES THAT THE AUTHORITY IS NOT A MANUFACTURER OF ANY PORTION OF THE LEASED PROPERTY OR A DEALER THEREIN, THAT THE CITY LEASES THE LEASED PROPERTY AS-IS, IT BEING AGREED THAT ALL OF THE AFOREMENTIONED RISKS ARE TO BE BORNE BY THE CITY. In no event is the Authority liable for incidental, indirect, special or consequential damages, in connection with or arising out of this Lease or the Trust Agreement for the existence, furnishing, function or the City’s use of the Leased Property.

SECTION 6.2. Access to the Leased Property. The City agrees that the Authority and any Authority Representative, and the Authority’s successors or assigns, may at all reasonable times enter upon and to examine and inspect the Leased Property or any part thereof. The Authority and any Authority Representative have such rights of access to the Leased Property or any component thereof as may be reasonably necessary to cause the proper maintenance of the Leased Property in the event of failure by the City to perform its obligations hereunder; provided, however, that neither the Authority nor any of its assigns has any obligation to cause such proper maintenance.

SECTION 6.3. Release and Indemnification Covenants. The City shall indemnify the Authority, the Trustee and their respective officers, agents, successors and assigns against all claims, losses and damages, including legal fees and expenses, arising out of any of the following:

(a) the use, maintenance, condition or management of, or from any work or thing done on the Leased Property by the City,

(b) any breach or default on the part of the City in the performance of any of its obligations under this Lease,

(c) any negligence or willful misconduct of the City or of any of its agents, contractors, servants, employees or licensees with respect to the Leased Property, or

(d) any intentional misconduct or negligence of any sublessee of the City with respect to the Leased Property.

No indemnification is made under this Section or elsewhere in this Lease for willful misconduct or negligence under this Lease by the Authority, the Trustee or their respective officers, agents, employees, successors or assigns.
SECTION 6.4. Assignment and Subleasing by the City. The City may sublease the Leased Property, or any portion thereof, subject to all of the following conditions:

(a) This Lease and the obligation of the City to make Lease Payments hereunder shall remain obligations of the City.

(b) The City shall, within 30 days after the delivery thereof, furnish or cause to be furnished to the Authority and the Trustee a true and complete copy of such sublease.

(c) No such sublease by the City shall cause the Leased Property to be used for a purpose which is not authorized under the provisions of the laws of the State of California.

(d) The City shall furnish the Authority and the Trustee with a written opinion of Bond Counsel stating that such sublease does not cause the interest components of the Lease Payments to become includable in gross income for purposes of federal income taxation or to become subject to personal income taxation by the State of California.

SECTION 6.5. Amendment of Lease Agreement. The Authority and the City may at any time amend or modify any of the provisions of this Lease, but only: (a) with the prior written consents of the Owners of a majority in aggregate principal amount of the Outstanding Certificates; or (b) without the consent of the Trustee or any of the Certificate Owners, but only if such amendment or modification is for any one or more of the following purposes:

(i) to add to the covenants and agreements of the City contained in this Lease, other covenants and agreements thereafter to be observed, or to limit or surrender any rights or power herein reserved to or conferred upon the City;

(ii) to cure any ambiguity, or to cure, correct or supplement any defective provision contained herein, for the purpose of conforming to the original intention of the City and the Authority;

(iii) to amend any provision thereof relating to the Tax Code, but only if and to the extent such amendment will not adversely affect the exclusion from gross income of interest represented by any of the Certificates under the Tax Code, in the opinion of Bond Counsel;

(iv) to amend the description of any component of the Leased Property to reflect accurately the property originally intended to be included therein, or to effectuate any substitution of property as permitted by Section 3.3 or any release of property as permitted by Section 3.4;

(v) to obligate the City to pay additional amounts of rental hereunder for the use and occupancy of the Leased Property or any portion thereof, but only if (A) such additional amounts of rental are pledged or assigned for the payment of any bonds, notes, leases or other
obligations the proceeds of which are applied to finance public
capital improvements within the City, and (B) the City has filed with
the Trustee written evidence that the amendments made under this
subsection (v) will not of themselves cause a reduction or
withdrawal of any rating then assigned to the Certificates; or

(vi) in any other respect whatsoever as the Authority and the City deem
necessary or desirable, provided that, in the opinion of Bond
Counsel, such modifications or amendments do not materially
adversely affect the interests of the Owners of the Certificates.

The City shall obtain and cause to be filed with the Trustee an opinion of Bond
Counsel with respect to any amendment or modification hereof, stating that all conditions
precedent to such amendment as set forth in this Section have been satisfied. Promptly
following the effective date of any amendment or modification under this Section, the
City shall mail written notice thereof to each rating agency which then maintains a rating
on the Certificates.

ARTICLE VII

EVENTS OF DEFAULT AND REMEDIES

SECTION 7.1. Events of Default Defined. Each of the following events constitutes
an Event of Default hereunder:

(a) Failure by the City to pay any Lease Payment or other payment
required to be paid hereunder at the time specified herein.

(b) Failure by the City to observe and perform any covenant, condition
or agreement on its part to be observed or performed herein or in
the Trust Agreement, other than as referred to in the preceding
subsection (a), for a period of 30 days after written notice specifying
such failure and requesting that it be remedied has been given to
the City by the Authority or the Trustee; provided, however, that if
the City notifies the Authority and the Trustee that in its reasonable
opinion the failure stated in the notice can be corrected, but not
within such 30-day period, the failure will not constitute an Event of
Default if the City commences to cure the failure within such 30-day
period and thereafter diligently and in good faith cures such failure
in a reasonable period of time.

(c) The filing by the City of a voluntary petition in bankruptcy, or failure
by the City promptly to lift any execution, garnishment or
attachment, or adjudication of the City as a bankrupt, or assignment
by the City for the benefit of creditors, or the entry by the City into an
agreement of composition with creditors, or the approval by a court
of competent jurisdiction of a petition applicable to the City in any
proceedings instituted under the provisions of the Federal
Bankruptcy Code, as amended, or under any similar acts which may hereafter be enacted.

SECTION 7.2. Remedies on Default. Whenever any Event of Default has happened and is continuing, the Authority may exercise any and all remedies available under law or granted under this Lease. Notwithstanding anything herein or in the Trust Agreement to the contrary, there is no right under any circumstances to accelerate the Lease Payments or otherwise declare any Lease Payments not then in default to be immediately due and payable. Each and every covenant hereof to be kept and performed by the City is expressly made a condition and upon the breach thereof the Authority may exercise any and all rights granted hereunder; provided, that no termination of this Lease shall be effected either by operation of law or acts of the parties hereto, except only in the manner herein expressly provided. Upon the occurrence and during the continuance of any Event of Default, the Authority may exercise each and every one of the following remedies, subject in all respects to the limitations set forth in Section 7.3.

(a) Enforcement of Payments Without Termination. If the Authority does not elect to terminate this Lease in the manner hereinafter provided for in subsection (b) of this Section, the City agrees to remain liable for the payment of all Lease Payments and the performance of all conditions herein contained and shall reimburse the Authority for any deficiency arising out of the re-leaseing of the Leased Property, or, if the Authority is unable to re-lease the Leased Property, then for the full amount of all Lease Payments to the end of the Term of this Lease, but said Lease Payments and/or deficiency shall be payable only at the same time and in the same manner as hereinafore provided for the payment of Lease Payments hereunder, notwithstanding such entry or re-entry by the Authority or any suit in unlawful detainer, or otherwise, brought by the Authority for the purpose of effecting such re-entry or obtaining possession of the Leased Property or the exercise of any other remedy by the Authority.

The City hereby irrevocably appoints the Authority as the agent and attorney-in-fact of the City to enter upon and re-lease the Leased Property upon the occurrence and continuation of an Event of Default and to remove all personal property whatsoever situated upon the Leased Property, to place such property in storage or other suitable place in the County of San Mateo for the account of and at the expense of the City, and the City hereby agrees to save harmless the Authority from any costs, loss or damage whatsoever arising or occasioned by any such entry upon and re-leasing of the Leased Property and the removal and storage of such property by the Authority or its duly authorized agents in accordance with the provisions herein contained. The City agrees that the terms of this Lease constitute full and sufficient notice of the right of the Authority to re-lease the Leased Property in the event of such re-entry without effecting a surrender of this Lease, and further agrees that no acts of the Authority in effecting such re-leasing constitute a surrender or termination of this Lease irrespective of the term for which such re-
leasing is made or the terms and conditions of such re-leasing, or otherwise, but that, on the contrary, in the event of such default by the City the right to terminate this Lease shall vest in the Authority to be effected in the sole and exclusive manner hereinafter provided for in subsection (b) of this Section. The City agrees to surrender and quit possession of the Leased Property upon demand of the Authority for the purpose of enabling the Leased Property to be re-let under this paragraph. Any rental obtained by the Authority in excess of the unpaid Lease Payments shall be deposited with the Trustee in the Lease Payment Fund, to be applied as a credit against future Lease Payments.

(b) Termination of Lease. If an Event of Default occurs and is continuing hereunder, the Authority at its option may terminate this Lease and re-lease all or any portion of the Leased Property. If the Authority terminates this Lease at its option and in the manner hereinafter provided on account of default by the City (and notwithstanding any re-entry upon the Leased Property by the Authority in any manner whatsoever or the re-leasing of the Leased Property), the City nevertheless agrees to pay to the Authority all costs, loss or damages howsoever arising or occurring payable at the same time and in the same manner as is herein provided in the case of payment of Lease Payments and Additional Payments. Any surplus received by the Authority from such re-leasing shall be deposited in the Lease Payment Fund. Neither notice to pay rent or to deliver up possession of the premises given under law nor any proceeding in unlawful detainer taken by the Authority shall of itself operate to terminate this Lease, and no termination of this Lease on account of default by the City shall be or become effective by operation of law, or otherwise, unless and until the Authority has given written notice to the City of the election on the part of the Authority to terminate this Lease. The City agrees that no surrender of the Leased Property, or of the remainder of the Term hereof or any termination of this Lease shall be valid in any manner or for any purpose whatsoever unless stated or accepted by the Authority by such written notice.

(c) Proceedings at Law or In Equity. If an Event of Default occurs and continues hereunder, the Authority may take whatever action at law or in equity may appear necessary or desirable to collect the amounts then due and thereafter to become due hereunder or to enforce any other of its rights hereunder.

SECTION 7.3. No Remedy Exclusive. No remedy herein conferred upon or reserved to the Authority is intended to be exclusive and every such remedy is cumulative and in addition to every other remedy given under this Lease or now or hereafter existing at law or in equity. No delay or omission to exercise any right or power accruing upon the occurrence of any Event of Default shall impair any such right or power or shall be construed to be a waiver thereof, but any such right and power may be exercised from time to time and as often as may be deemed expedient. In order to entitle the Authority to exercise any remedy reserved to it in this Article it is not
necessary to give any notice, other than such notice as may be required in this Article or by law.

SECTION 7.4. Agreement to Pay Attorneys’ Fees and Expenses. If either party to this Lease defaults under any of the provisions hereof and the non-defaulting party employs attorneys or incurs other expenses for the collection of moneys or the enforcement or performance or observance of any obligation or agreement on the part of the defaulting party herein contained, the defaulting party agrees that it will on demand therefor pay to the non-defaulting party the reasonable fees of such attorneys and such other expenses so incurred by the non-defaulting party.

SECTION 7.5. No Additional Waiver Implied by One Waiver. If any agreement contained in this Lease is breached by either party and thereafter waived by the other party, such waiver will be limited to the particular breach so waived and will not constitute a waiver of any other breach hereunder.

SECTION 7.6. Application of Proceeds. All net proceeds received from the release of the Leased Property under this Article, and all other amounts derived by the Authority or the Trustee as a result of the occurrence of an Event of Default, shall be paid to the Trustee and applied in accordance with Section 12.04 of the Trust Agreement.

SECTION 7.7. Trustee and Certificate Owners to Exercise Rights. Such rights and remedies as are given to the Authority under this Article have been assigned by the Authority to the Trustee under the Assignment Agreement for the benefit of the Certificate Owners, to which assignment the City hereby consents. The Trustee and the Certificate Owners shall exercise such rights as provided in the Trust Agreement.

ARTICLE VIII

PREPAYMENT OF LEASE PAYMENTS

SECTION 8.1. Security Deposit. Notwithstanding any other provision of this Lease, the City may on any date secure the payment of the Lease Payments in whole or in part by depositing with the Trustee an amount of cash which, together with other available amounts on deposit in the funds and accounts established under the Trust Agreement, is either (a) sufficient to pay such Lease Payments, including the principal and interest components thereof, in accordance with the Lease Payment schedule set forth in Appendix B, or (b) invested in whole or in part in non-callable Federal Securities in such amount as will, in the opinion of an independent certified public accountant, (which opinion shall be addressed and delivered to the Trustee), together with interest to accrue thereon and together with any cash which is so deposited, be fully sufficient to pay such Lease Payments when due under Section 3.3(a) as the City instructs at the time of said deposit.

If the City posts a security deposit under this Section with respect to all unpaid Lease Payments and if the City has paid or caused to be paid all Additional Payments then due and payable, and notwithstanding the provisions of Section 3.2, (a) the Term of this Lease will continue, (b) all obligations of the City under this Lease, and all security
provided by this Lease for said obligations, will thereupon cease and terminate, excepting only the obligation of the City to make, or cause to be made all of the Lease Payments from such security deposit, and (c) under Section 3.6, title to the Leased Property will vest in the City on the date of said deposit automatically and without further action by the City or the Authority. Said security deposit constitutes a special fund for the payment of Lease Payments in accordance with the provisions of this Lease.

SECTION 8.2. Optional Prepayment. The City may exercise its option to prepay the principal components of the Lease Payments in whole, or in part in any integral multiple of $5,000, on any date on or after January 1, 20___, by paying a prepayment price equal to the aggregate principal components of the Lease Payments to be prepaid, without prepayment premium. Such prepayment price shall be deposited by the Trustee upon receipt in the Lease Payment Fund, to be applied to the prepayment of Certificates under Section 3.01(a) of the Trust Agreement. The City shall give the Trustee written notice of its intention to exercise its option not less than 45 days in advance of the date of exercise.

SECTION 8.3. Mandatory Prepayment From Net Proceeds of Insurance or Eminent Domain. The District is obligated to prepay the principal components of the Lease Payments, in whole on any date or in part on any Interest Payment Date, from and to the extent of any Net Proceeds of insurance award or eminent domain award with respect to the Leased Property theretofore deposited in the Lease Payment Fund for such purpose under Article VI hereof and Article VI of the Trust Agreement. The District and the Corporation hereby agree that such Net Proceeds, to the extent remaining after payment of any delinquent Lease Payments, shall be credited towards the District's obligations under this Section 8.3. Such prepayment price shall be deposited by the Trustee in the Lease Payment Fund to be applied to the prepayment of Certificates under Section 3.01(b) of the Trust Agreement.

SECTION 8.4. Credit for Amounts on Deposit. If the City prepays the principal components of the Lease Payments in full under Sections 8.2 or 8.3, such that the Trust Agreement is discharged by its terms as a result of such prepayment, at the written election of the City filed with the Trustee any or all amounts then on deposit in the Lease Payment Fund will be credited towards the amounts then required to be so prepaid.
ARTICLE IX

MISCELLANEOUS

SECTION 9.1. Notices. Any notice, request, complaint, demand or other communication under this Lease may be given by first class mail or personal delivery to the party entitled thereto at its address set forth below, or by facsimile transmission or other form of telecommunication, at its number set forth below. Notice is effective either (a) upon transmission by facsimile transmission or other form of telecommunication, (b) 72 hours after deposit in the United States of America first class mail, postage prepaid, or (c) in the case of personal delivery to any person, upon actual receipt. The Authority, the City or the Trustee may, by written notice to the other parties, from time to time modify the address or number to which communications are to be given hereunder.

If to the City: City of Pacifica
or the Authority
170 Santa Maria Avenue
Pacifica, California 94044
Attention: Finance Director
Fax: (650) 359-6038

If to the Trustee: U.S. Bank National Association
One California Street, Suite 1000
San Francisco, California 94111
Attention: Global Corporate Trust Services
Fax: (415) 677-3768

SECTION 9.2. Binding Effect. This Lease inures to the benefit of and is binding upon the Authority, the City and their respective successors and assigns.

SECTION 9.3. Severability. If any provision of this Lease is held invalid or unenforceable by any court of competent jurisdiction, such holding does not invalidate or render unenforceable any other provision hereof.

SECTION 9.4. Net-net-net Lease. This Lease is a “net-net-net lease” and the City hereby agrees that the Lease Payments are an absolute net return to the Authority, free and clear of any expenses, charges or set-offs whatsoever.

SECTION 9.5. Third Party Beneficiary. The Trustee is hereby made a party beneficiary hereunder with all rights of a third party beneficiary.

SECTION 9.6. Further Assurances and Corrective Instruments. The Authority and the City shall, from time to time, execute, acknowledge and deliver, or cause to be executed, acknowledged and delivered, such supplements hereto and such further instruments as may reasonably be required for correcting any inadequate or incorrect description of the Leased Property hereby leased or intended so to be or for carrying out the expressed intention of this Lease.

SECTION 9.7. Execution in Counterparts. This Lease may be executed in several counterparts, each of which shall be an original and all of which shall constitute but one and the same instrument.
SECTION 9.8. Applicable Law. This Lease is governed by and construed in accordance with the laws of the State of California.

SECTION 9.9. Authority and City Representatives. Whenever under the provisions of this Lease the approval of the Authority or the City is required, or the Authority or the City is required to take some action at the request of the other, such approval or such request shall be given for the Authority by an Authority Representative and for the City by a City Representative, and any party hereto shall be authorized to rely upon any such approval or request.

SECTION 9.10. Captions. The captions or headings in this Lease are for convenience only and in no way define, limit or describe the scope or intent of any provisions or sections of this Lease.
IN WITNESS WHEREOF, the Authority and the City have caused this Lease to be executed in their respective names by their duly authorized officers, all as of the date first above written.

CITY OF PACIFICA FINANCING AUTHORITY, as lessor

By ____________________________
Executive Director

Attest

_____________________________
Secretary

CITY OF PACIFICA, as lessee

By ____________________________
City Manager

Attest

_____________________________
City Clerk
APPENDIX A

DESCRIPTION OF THE LEASED PROPERTY

The Leased Property consists of the following described land located in the City of Pacifica, County of San Mateo, State of California, together with all buildings, facilities and other improvements which constitute real property and which are located thereon:

PARCEL ONE:

Beginning at a point on the Southwesterly line of that certain 60-foot strip or parcel of land described in Deed from the Hibernia Savings and Loan Society, a corporation, to County of San Mateo, a political subdivision of the State of California, dated November 3, 1939 and recorded July 18, 1941, in Book 980 of Official Records, at Page 1, Records of San Mateo County, California, distant thereon 170.22 feet from the point of intersection thereof with the Southeasterly line of the State Highway, Route 56, Section D, San Mateo County, California, extended Northwesterly; thence along the Southwesterly line of said land so conveyed to County of San Mateo, South 53° 01' East, 221.71 feet; thence leaving said last mentioned line, South 40° 16' West, 565.61 feet to the Southwesterly line of that certain 173.2 acre tract of land described in Deed from the Hibernia Savings and Loan Society, a corporation, to Egidio Maracci, dated August 1, 1941, and recorded August 19, 1941, in Book 982 of Official Records, at Page 55, Records of San Mateo County, California; thence along said last mentioned line, North 65° 26' West, 229.93 feet; thence North 40° 16' East, 615.13 feet to the point of beginning.

Being a portion of Lot 1 as shown on that certain Map entitled, "Map of the Southerly Regan Tract on San Pedro Ranch", filed in the Office of the County Recorder of San Mateo County, on November 9, 1872, in Book 1 of Maps, at Page 26, and copied into Book 19 of Maps, at Page 16.

EXCEPTING THEREFROM, the Northeasterly 10 feet as conveyed to the City of Pacifica by that certain Deed recorded February 15, 1966, in Book 5112 of Official Records, at Page 262 (File No. 38576-Z), Records of San Mateo County, California.

APN: 022-162-420 (Ptn.)  J.P.N. 022-016-162-41 A

PARCEL TWO:

Beginning at a point on the Southwesterly line of that certain 60-foot strip or parcel of land described in the Deed from the Hibernia Savings and Loan Society, a corporation, to County of San Mateo, a political subdivision of the State of California, dated November 3, 1939 and recorded July 18, 1941, in Book 980 of Official Records of San Mateo County, at Page 1; distant thereon 391.93 feet Southeasterly from the point of intersection thereof with the Southeasterly line of the State Highway, Route 56, Section D, San Mateo County, California, extended Northwesterly; thence along the Southwesterly line of said land so conveyed to County of San Mateo, South 53° 01' East, 55 feet; thence leaving said last mentioned line, South 40° 16' West, 553.33 feet to the
Southwesterly line of that certain 173.2 acre tract of land described in the Deed from the Hibernia Savings and Loan Society, a corporation to Egidio Maracci, dated August 1, 1941 and recorded August 19, 1941, in Book 982 of Official Records of San Mateo County, at Page 55; thence along said last mentioned line, North 65° 26' West, 57.03 feet; and thence North 40° 16' East 565.61 feet to the point of beginning.

Being a portion of Lot 1, as delineated upon that certain Map entitled, "Map of the Southerly Regan Tract on San Pedro Ranch", filed for Record in the Office of the Recorder of the County of San Mateo, State of California, on November 9th, 1872 in Book 1 of Maps, at Page 26, and a copy entered in Book 19 of Maps, at Page 16.

EXCEPTING THEREFROM said land conveyed to the City of Pacifica, recorded February 11, 1970, Book 5747, Page 676, under Recorder's Serial Number 96675-AC, Official Records.

APN: 022-162-420 (Ptn)      J.P.N. 022-016-162-40 A

PARCEL THREE:

Beginning at a point on the Easterly line of that certain 398.284 acre tract of land shown on Map recorded in Map Book 1 of Licensed Land Surveyors Maps at page 78, San Mateo County Records, North 2° 01’ East 90 feet; from a concrete monument at the Northerly end of Reichlin Avenue, said point of beginning being the Northeasterly corner of land conveyed by Deed from Title Insurance and Guaranty Co. to George F. Laskey and wife, dated December 28, 1944 and recorded January 29, 1945 in volume 1156 of Official Records at page 283 (38278-F), Records of San Mateo County, State of California; running thence from said point of beginning and along the Northerly boundary of land so conveyed to Laskey North 85° 45’ West 599.40 feet, more or less, to the Easterly line of the State Highway; thence along the Easterly line of said highway Northerly on the arc of a curve with a radius of 1560 feet an arc distance of 452.36 feet; thence leaving said highway and running South 85° 45' East 441.28 feet, more or less, to the Easterly line of said 398.284 acre tract; thence along said last mentioned line South 2° 01’ West 428.36 feet to the point of beginning.

Being a portion of land conveyed to Title Insurance and Guaranty Co. by Deed from John J. Kelly, dated November 23, 1943 and recorded December 20, 1943 in Book 1077 at page 176 of Official Records of San Mateo County, California.

EXCEPTING THEREFROM any portion thereof included within the limits of that certain 60 foot strip conveyed by Deed from Mary A. Tobin to Ocean Shore Railway Company, dated July 14, 1905 and recorded July 17, 1905 in Book 118 at page 347 of Deeds, Records of San Mateo County, State of California.

APN: 018-051-050      J.P.N. 018-005-051-05 A
APPENDIX B

SCHEDULE OF LEASE PAYMENTS

<table>
<thead>
<tr>
<th>Lease Payment Date</th>
<th>Principal Component</th>
<th>Interest Component</th>
<th>Aggregate Lease Payment</th>
</tr>
</thead>
</table>

* Lease Payments are due no later than the 5th Business Day preceding each of the listed payment dates.
AMENDED AND RESTATED
SITE LEASE

This AMENDED AND RESTATED SITE LEASE (this “Site Lease”), dated as of October 1, 2016, is between the CITY OF PACIFICA, a municipal corporation duly organized and existing under the laws of the State of California, as lessor (the “City”), and the CITY OF PACIFICA FINANCING AUTHORITY, a joint exercise of powers agency duly organized and existing under the laws of the State of California, as lessee (the “Authority”).

BACKGROUND:

1. In order to refinance outstanding lease obligations of the City and provide financing for certain public capital improvements, the City and the Authority have previously entered into a First Amended and Restated Site Lease dated as of May 1, 2006, which was recorded on May 15, 2006, as Instrument No. 2006-072697 of the Official Records of the San Mateo County Recorder’s Office, as amended by a Second Amendment and Restated Site Lease dated as of August 1, 2008, which was recorded on August 1, 2008, as Instrument No. 2008-089105 of the Official Records of the San Mateo County Recorder’s Office (collectively, the “2006 Site Lease”), under which the City has leased certain real property consisting of the land and buildings comprising a Public Safety Building located at 2705 Coast Highway in the City, and a Community Center located at Coast Highway and Crespi Drive in the City, as described more fully in Appendix A attached to the 2006 Site Lease, and the Authority has leased such real property back to the City under a First Amended and Restated Lease Agreement dated as of May 1, 2006, which was recorded on May 15, 2006, as Instrument No. 2006-072698 of the Official Records of the San Mateo County Recorder’s Office, as amended by an Amendment to First Amended and Restated Lease Agreement dated as of August 1, 2008, which was recorded on August 1, 2008, as Instrument No. 2008-089104 of the
Official Records of the San Mateo County Recorder’s Office (collectively, the “2008 Lease Agreement”).

2. Under the 2008 Lease Agreement, the City is obligated to pay semiannual lease payments (the “2008 Lease Payments”) to the Authority as the rental of the real property which is leased thereunder, and the 2008 Lease Payments are evidenced and represented by the Certificates of Participation (2008 Conversion of 2006 Auction Rate Certificates) which have been executed and delivered in the aggregate original principal amount of $19,815,000 (the “2008 Certificates”), under a Trust Agreement dated as of August 1, 2008, among the City, the Authority and Deutsche Bank National Trust Company, as trustee.

3. The 2008 Lease Payments and the 2008 Certificates are subject to prepayment on any date at a prepayment price equal to 102% of the principal components of the 2008 Lease Payments to be prepaid, plus accrued interest on such prepaid principal components to the prepayment date.

4. In order to provide funds to refinance the 2008 Lease Payments and the 2008 Certificates and thereby realize debt service savings, the City and the Authority have proposed to amend and restate the 2006 Site Lease as provided herein, and the City and the Authority have further proposed to amend and restate the 2008 Lease under an Amended and Restated Lease Agreement which has been recorded concurrently herewith (the “Lease Agreement”) for the purpose, among others, of substituting a portion of the real property which is leased thereunder and obligating the City to pay a reduced amount of semiannual lease payments (the “Lease Payments”) therefor.

5. The Authority has agreed to assign its right to receive the Lease Payments to U.S. Bank National Association, as trustee (the “Trustee”), and in consideration of such assignment the Trustee has agreed to execute and deliver 2016 Refunding Certificates of Participation (2008 Certificate Refinancing) in the aggregate principal amount of $__________ (the “Certificates”), each evidencing a direct, undivided fractional interest in the Lease Payments, under a Trust Agreement dated as of October 1, 2016 (the “Trust Agreement”), among the Authority, the City and the Trustee.

6. The Authority has been organized for the purpose of providing financial assistance to the City and is authorized to enter into financing documents for that purpose.

AGREEMENT:

In consideration of the foregoing and the material covenants hereinafter contained, the City and the Authority formally covenant, agree and bind themselves as follows:

SECTION 1. Definitions. Unless the context clearly otherwise requires or unless otherwise defined herein, the capitalized terms in this Site Lease have the respective meanings given them in the Trust Agreement.
SECTION 1. Restatement of 2006 Site Lease; Lease of Leased Property. This Lease constitutes an amendment and restatement in full of the 2006 Site Lease. From and after the Closing Date, the 2006 Site Lease, in the form heretofore executed and delivered by the City and the Authority, will be of no further force and effect and will be deemed to be restated in full hereby. The City continues to and does hereby lease the real property which is described more fully in Appendix A hereto (the “Leased Property”) to the Authority, upon the terms and conditions set forth in this Site Lease, without interruption by virtue of the amendment and restatement of the 2006 Site Lease hereby. The City and the Authority acknowledge and agree that the Leased Property includes a portion but not all of the real property which was originally leased under the 2006 Site Lease, together with additional real property which was not originally leased under the 2006 Site Lease. The City and the Authority shall cause to be executed, delivered and recorded all documentation, and take all actions, as shall be required to release from the 2006 Site Lease all real property which was originally leased thereunder and which is not described in Appendix A hereto.

SECTION 3. Term; Possession. The term of this Site Lease commences, and the Authority becomes entitled to possession of the Leased Property, as of the date of recordation hereof. This Site Lease ends, and the right of the Authority hereunder to possession of the Leased Property thereupon ceases, on the date on which all of the outstanding Certificates are paid in full, or provision is made for such payment in accordance with the Trust Agreement, and the Trust Agreement has been discharged under Section 13.01 thereof, but under any circumstances not later than January 1, 2047.

SECTION 4. Rental. The Authority shall pay to the City as and for rental of the Leased Property hereunder, from the proceeds of sale of the Certificates, the amount of $__________ (the “Site Lease Payment”) to be paid on the date of execution and delivery hereof. From the proceeds of the Site Lease Payment, an amount required to prepay and discharge the 2008 Lease Payments and the 2008 Certificates will be deposited with the Escrow Bank to be applied for that purpose in accordance with the Escrow Agreement, and the remainder of such proceeds will be deposited into the Costs of Issuance Fund in accordance with the Trust Agreement.

The Authority and the City hereby find and determine that the total amount of the Site Lease Payment does not exceed the estimated value of the leasehold interest in the Leased Property which is conveyed hereunder by the City to the Authority. No other amounts of rental is due and payable by the Authority for the use and occupancy of the Leased Property under this Site Lease.

SECTION 5. Assignments and Subleases. Unless the City is in default under the Lease Agreement, the Authority may not assign its rights under this Site Lease or sublet all or any portion of the Leased Property, except as provided in the Lease Agreement, without the prior written consent of the City.

SECTION 6. Right of Entry. The City reserves the right for any of its duly authorized representatives to enter upon the Leased Property, or any portion thereof, at any reasonable time to inspect the same or to make any repairs, improvements or changes necessary for the preservation thereof.
SECTION 7. Termination. The Authority agrees, upon the termination of this Site Lease, to quit and surrender the Leased Property in the same good order and condition as the Leased Property was in at the time of commencement of the term hereof, reasonable wear and tear excepted, and agrees that all buildings, improvements and structures then existing upon the Leased Property will remain thereon and title thereto will vest thereupon in the City for no additional consideration.

SECTION 8. Default. If the Authority defaults in the performance of any obligation on its part to be performed under the terms of this Site Lease, which default continues for 30 days following notice and demand for correction thereof to the Authority, the City may exercise any and all remedies granted by law, except that no merger of this Site Lease and of the Lease Agreement shall be deemed to occur as a result thereof and this Site Lease may not be terminated by the City as a remedy for such default. Notwithstanding the foregoing, so long as the Lease Agreement remains in effect, the City shall continue to pay the Lease Payments to the Trustee.

SECTION 9. Amendments. The Authority and the City may at any time amend or modify any of the provisions of this Site Lease, but only (a) with the prior written consents of Owners of a majority in aggregate principal amount of the Outstanding Certificates; or (b) without the consent of the Trustee or any of the Certificate Owners, but only if such amendment or modification is for any one or more of the following purposes:

(i) to add to the covenants and agreements of the City or the Authority contained in this Site Lease, other covenants and agreements thereafter to be observed, or to limit or surrender any rights or power herein reserved to or conferred upon the City or the Authority,

(ii) to cure any ambiguity, or to cure, correct or supplement any defective provision contained herein, for the purpose of conforming to the original intention of the City and the Authority,

(iii) to amend any provision thereof relating to the Tax Code, but only if and to the extent such amendment will not adversely affect the exclusion from gross income of interest represented by any of the Certificates under the Tax Code, in the opinion of Bond Counsel,

(iv) to amend the description of any component of the Leased Property to reflect accurately the property originally intended to be included therein, or to effectuate any substitution of property as permitted by Section 3.6 of the Lease Agreement or any release or property as permitted by Section 3.7 of the Lease Agreement,

(v) in any other respect whatsoever as the Authority and the City deem necessary or desirable, provided that, in the opinion of Bond Counsel, such modifications or amendments do not materially adversely affect the interests of the Owners of the Certificates.

The City shall obtain and cause to be filed with the Trustee an opinion of Bond Counsel with respect to any amendment or modification hereof, stating that all conditions precedent to such amendment as set forth in this Section have been satisfied. Promptly
following the effective date of any amendment or modification under this Section, the City shall mail written notice thereof to each rating agency which then maintains a rating on the Certificates.

SECTION 10. Quiet Enjoyment. The Authority at all times during the term of this Site Lease shall peaceably and quietly have, hold and enjoy all of the Leased Property, subject to the provisions of the Lease Agreement and subject only to Permitted Encumbrances.

SECTION 11. Waiver of Personal Liability. All liabilities under this Site Lease on the part of the Authority are solely corporate liabilities of the Authority as a public agency, and the City hereby release each and every member and officer of the Authority of and from any personal or individual liability under this Site Lease. No member or officer of the Authority or its governing board is at any time or under any circumstances individually or personally liable under this Site Lease for anything done or omitted to be done by the Authority hereunder.

SECTION 12. Taxes. The City will pay any and all assessments of any kind or character and also all taxes, including possessory interest taxes, levied or assessed upon the Leased Property and any improvements thereon.

SECTION 13. Eminent Domain. If the whole or any part of the Leased Property, or any improvements thereon, are taken by eminent domain proceedings, the interest of the Authority will be the aggregate amount of the then unpaid principal components of the Lease Payments payable under the Lease Agreement and the balance of the award, if any, will be paid to the City. The City hereby waives any and all rights that it has or may hereafter have to acquire the interest of the Authority in and to the Leased Property through the eminent domain powers of the City.

SECTION 14. Notices. Any notice, request, complaint, demand or other communication under this Site Lease must be given by first class mail or personal delivery to the party entitled thereto at its address set forth below, or by telecopy, telex or other form of telecommunication, at its number set forth below. Notice will be effective either (a) upon transmission by telecopy, telex or other form of telecommunication, (b) 48 hours after deposit in the United States mail, postage prepaid, or (c) in the case of personal delivery to any person, upon actual receipt. The City, the Authority and the Trustee may, by written notice to the other parties, from time to time modify the address or number to which communications are to be given hereunder.

If to the City: City of Pacifica
or the Authority
170 Santa Maria Avenue
Pacifica, California 94044
Attention: Finance Director
Fax: (650) 359-6038

If to the Trustee: U.S. Bank National Association
One California Street, Suite 1000
San Francisco, California 94111
Attention: Global Corporate Trust Services
Fax: (415) 677-3768
SECTION 15. Governing Law. This Site Lease shall be governed by the laws of the State of California.

SECTION 16. Binding Effect. This Site Lease inures to the benefit of and is binding upon the Authority, the City and their respective successors and assigns, subject, however, to the limitations contained herein.

SECTION 17. Severability of Invalid Provisions. If any one or more of the provisions contained in this Site Lease are for any reason held to be invalid, illegal or unenforceable in any respect, then such provision or provisions will be deemed severable from the remaining provisions contained in this Site Lease and such invalidity, illegality or unenforceability shall not affect any other provision of this Site Lease, and this Site Lease shall be construed as if such invalid or illegal or unenforceable provision had never been contained herein. The Authority and the City each hereby declares that it would have entered into this Site Lease and each and every other Section, paragraph, sentence, clause or phrase hereof irrespective of the fact that any one or more Sections, paragraphs, sentences, clauses or phrases of this Site Lease may be held illegal, invalid or unenforceable.

SECTION 18. Section Headings. All section headings contained herein are for convenience of reference only and are not intended to define or limit the scope of any provision of this Site Lease.

SECTION 19. Execution in Counterparts. This Site Lease may be executed in any number of counterparts, each of which is an original but all together constitute one and the same instrument. It is also agreed that separate counterparts of this Site Lease may be separately executed by the Authority and the City, all with the same force and effect as though the same counterpart had been executed by both the Authority and the City.

SECTION 20. Third Party Beneficiary. The Trustee is hereby made a party beneficiary hereunder with all rights of a third party beneficiary.
IN WITNESS WHEREOF, the City and the Authority have caused this Site Lease to be executed by their respective officers thereunto duly authorized, all as of the day and year first above written.

CITY OF PACIFICA, as lessor

By ________________

City Manager

Attest

_____________________

City Clerk

CITY OF PACIFICA FINANCING AUTHORITY, as lessee

By ________________

Executive Director

Attest

_____________________

Secretary
APPENDIX A

DESCRIPTION OF THE LEASED PROPERTY

The Leased Property consists of the following described land located in the City of Pacifica, County of San Mateo, State of California, together with all buildings, facilities and other improvements which constitute real property and which are located thereon:

PARCEL ONE:

Beginning at a point on the Southwesterly line of that certain 60-foot strip or parcel of land described in Deed from the Hibernia Savings and Loan Society, a corporation, to County of San Mateo, a political subdivision of the State of California, dated November 3, 1939 and recorded July 18, 1941, in Book 980 of Official Records, at Page 1, Records of San Mateo County, California, distant thereon 170.22 feet from the point of intersection thereof with the Southeasterly line of the State Highway, Route 56, Section D, San Mateo County, California, extended Northwesterly; thence along the Southwesterly line of said land so conveyed to County of San Mateo, South 53° 01' East, 221.71 feet; thence leaving said last mentioned line, South 40° 16' West, 565.61 feet to the Southwesterly line of that certain 173.2 acre tract of land described in Deed from the Hibernia Savings and Loan Society, a corporation, to Egidio Maracci, dated August 1, 1941, and recorded August 19, 1941, in Book 982 of Official Records, at Page 55, Records of San Mateo County, California; thence along said last mentioned line, North 65° 26' West, 229.93 feet; thence North 40° 16' East, 615.13 feet to the point of beginning.

Being a portion of Lot 1 as shown on that certain Map entitled, "Map of the Southerly Regan Tract on San Pedro Ranch", filed in the Office of the County Recorder of San Mateo County, on November 9, 1872, in Book 1 of Maps, at Page 26, and copied into Book 19 of Maps, at Page 16.

EXCEPTING THEREFROM, the Northeasterly 10 feet as conveyed to the City of Pacifica by that certain Deed recorded February 15, 1966, in Book 5112 of Official Records, at Page 262 (File No. 38576-Z), Records of San Mateo County, California.

APN: 022-162-420 (Ptn.) J.P.N. 022-016-162-41 A

PARCEL TWO:

Beginning at a point on the Southwesterly line of that certain 60-foot strip or parcel of land described in the Deed from the Hibernia Savings and Loan Society, a corporation, to County of San Mateo, a political subdivision of the State of California, dated November 3, 1939 and recorded July 18, 1941, in Book 980 of Official Records of San Mateo County, at Page 1; distant thereon 391.93 feet Southeasterly from the point of intersection thereof with the Southeasterly line of the State Highway, Route 56, Section D, San Mateo County, California, extended Northwesterly; thence along the Southwesterly line of said land so conveyed to County of San Mateo, South 53° 01' East, 55 feet; thence leaving said last mentioned line, South 40° 16' West, 553.33 feet to
the Southwesterly line of that certain 173.2 acre tract of land described in the Deed from
the Hibernia Savings and Loan Society, a corporation to Egidio Maracci, dated August 1,
1941 and recorded August 19, 1941, in Book 982 of Official Records of San Mateo
County, at Page 55; thence along said last mentioned line, North 65° 26' West, 57.03
feet; and thence North 40° 16' East 565.61 feet to the point of beginning.

Being a portion of Lot 1, as delineated upon that certain Map entitled, "Map of the
Southerly Regan Tract on San Pedro Ranch", filed for Record in the Office of the
Recorder of the County of San Mateo, State of California, on November 9th, 1872 in
Book 1 of Maps, at Page 26, and a copy entered in Book 19 of Maps, at Page 16.

EXCEPTING THEREFROM said land conveyed to the City of Pacifica, recorded
February 11, 1970, Book 5747, Page 676, under Recorder's Serial Number 96675-AC,
Official Records.

APN: 022-162-420 (Ptn) J.P.N. 022-016-162-40 A

PARCEL THREE:

Beginning at a point on the Easterly line of that certain 398.284 acre tract of land shown
on Map recorded in Map Book 1 of Licensed Land Surveyors Maps at page 78, San
Mateo County Records, North 2° 01' East 90 feet; from a concrete monument at the
Northerly end of Reichling Avenue, said point of beginning being the Northeasterly
corner of land conveyed by Deed from Title Insurance and Guaranty Co. to George F.
Laskey and wife, dated December 28, 1944 and recorded January 29, 1945 in volume
1156 of Official Records at page 283 (38278-F), Records of San Mateo County, State of
California; running thence from said point of beginning and along the Northerly boundary
of land so conveyed to Laskey North 85° 45' West 599.40 feet, more or less, to the
Easterly line of the State Highway; thence along the Easterly line of said highway
Northerly on the arc of a curve with a radius of 1560 feet an arc distance of 452.36 feet;
thence leaving said highway and running South 85° 45' East 441.28 feet, more or less,
to the Easterly line of said 398.284 acre tract; thence along said last mentioned line
South 2° 01' West 428.36 feet to the point of beginning.

Being a portion of land conveyed to Title Insurance and Guaranty Co. by Deed from
John J. Kelly, dated November 23, 1943 and recorded December 20, 1943 in Book 1077
at page 176 of Official Records of San Mateo County, California.

EXCEPTING THEREFROM any portion thereof included within the limits of that certain
60 foot strip conveyed by Deed from Mary A. Tobin to Ocean Shore Railway Company,
dated July 14, 1905 and recorded July 17, 1905 in Book 118 at page 347 of Deeds,
Records of San Mateo County, State of California.

APN: 018-051-050 J.P.N. 018-005-051-05 A
CITY OF PACIFICA
2016 REFUNDING CERTIFICATES OF PARTICIPATION
(2008 Certificates Refinancing)

CERTIFICATE PURCHASE AGREEMENT

September ___, 2016

City of Pacifica Financing Authority
170 Santa Maria Avenue
Pacifica, California 94044

City of Pacifica
170 Santa Maria Avenue
Pacifica, California 94044

Ladies and Gentlemen:

The undersigned, U.S. Bancorp Investments, Inc., as underwriter (the “Underwriter”), offers to enter into this Certificate Purchase Agreement, together with the exhibits hereto (the “Purchase Agreement”) with the City of Pacifica Financing Authority (the “Authority”), a joint powers authority created by a Joint Exercise of Powers Agreement dated as of October 14, 1996 (the “JPA Agreement”), between the Redevelopment Agency of the City of Pacifica, and the City of Pacifica (the “City”). This offer is made subject to the acceptance by the Authority and the City, by execution of this Purchase Agreement and its delivery to the Underwriter prior to 5:00 P.M., California time, on the date hereof, and, if not so accepted, shall be subject to withdrawal by the Underwriter upon notice delivered to the Authority and the City at any time prior to such acceptance.

Capitalized terms used in this Purchase Agreement and not otherwise defined herein shall have the meanings given to such terms as set forth in the Trust Agreement dated as of October 1, 2016 (the “Trust Agreement”) among the Authority, the City, and U.S. Bancorp Investments, Inc., as trustee (the “Trustee”).

Section 1. Purchase and Sale of the Certificates.

(a) Upon the terms and conditions and upon the basis of the representations set forth in this Purchase Agreement, the Authority and the City agree to deliver to the Underwriter, all (but not less than all) of the $__,____,000 principal amount of the City of Pacifica 2016 Refunding Certificates of Participation (2008 Certificates Refinancing) (the “Certificates”).
(b) The purchase price for the Certificates shall be $________ (representing the principal amount of the Certificates, plus a net original issue premium in the amount of $________ and less an Underwriter’s discount in the amount of $________).

(c) The execution and delivery of the Certificates to the Underwriter represents a negotiated transaction, and the Authority and the City each acknowledge and agree that: (i) the transaction contemplated by this Purchase Agreement is an arm’s length, commercial transaction among the Authority, the City, and the Underwriter in which the Underwriter is acting solely as a principal and is not acting as a municipal advisor, financial advisor or fiduciary to the Authority or the City; (ii) the Underwriter has not assumed any advisory or fiduciary responsibility to the Authority or the City with respect to the transaction contemplated hereby and the discussions, undertakings and procedures leading thereto (irrespective of whether the Underwriter has provided other services or is currently providing other services to the Authority or the City on other matters); (iii) the Underwriter is acting solely in its capacity as an underwriter for its own account, (iv) the only contractual obligations the Underwriter has to the Authority or the City with respect to the transaction contemplated hereby expressly are set forth in this Purchase Agreement; and (v) the Authority and the City have each consulted its own legal, accounting, tax, financial and other advisors, as applicable, to the extent they have deemed appropriate.

Section 2. The Certificates.

(a) The Certificates shall be dated their date of delivery and shall have the maturities and bear interest at the rates per annum and have the yields all as set forth on Schedule I attached hereto. The Certificates shall be as described in and shall be secured under and issued pursuant to the Trust Agreement and shall be payable and subject to prepayment as provided in the Trust Agreement and as described in the Official Statement.

(b) The proceeds of the Certificates, together with other available funds, shall be used to: (i) refinance the outstanding City of Pacific Certificates of Participation (2008 Conversion of 2006 Auction Rate Certificates) (the “2008 Certificates”); and (ii) pay certain costs associated with the delivery of the Certificates.

(c) A portion of the proceeds from the sale of the Certificates shall be deposited by the City in an escrow fund with respect to the 2008 Certificates (the “Escrow Fund”). The Escrow Fund is established pursuant to the terms and conditions of an Escrow Agreement dated October 1, 2016 (the “Escrow Agreement”) between the City and U.S. Bancorp Investments, Inc., as escrow agent (the “Escrow Agent”).

(d) The Certificates evidence and represent the direct, undivided fractional interests of the registered owners thereof in lease payments (the “Lease Payments”) to be made by the City to the Authority pursuant to the terms and conditions of an Amended and Restated Lease Agreement, dated as of October 1, 2016 (the “Lease Agreement”), by and between the City and the Authority for the right to use certain real property and improvements (the “Leased Property”) to be leased by the City from the Authority pursuant to the Lease Agreement. The City and the Authority will enter into an Amended and Restated Site Lease, dated as of October 1, 2016 (the “Site Lease”) pursuant to which the City (as owner of the Leased Property) will lease the Leased Property to the Authority.
Section 3. Official Statement.

(a) By acceptance of this proposal, the Authority and the City each ratifies, confirms and consents to the use and distribution by the Underwriter prior to the date hereof of the preliminary official statement, dated October __, 2016, relating to the Certificates (including the cover page, all appendices and all information incorporated therein, the “Preliminary Official Statement”). The Authority and the City each hereby certifies that such Preliminary Official Statement was deemed final as of its date, for purposes of Rule 15c2-12 promulgated under the Securities Exchange Act of 1934 (“Rule 15c2-12”) except for certain omissions permitted to be omitted therefrom by Rule 15c2-12. The Authority and the City executed and delivered a certificate in substantially the form attached hereto as Exhibit A;

(b) The Authority and the City shall supply or cause to be supplied to the Underwriter, within seven business days of the date of this Purchase Agreement and in time to accompany any confirmation that requests payment from any customer, a final official statement, dated the date hereof, relating to the Certificates (including all information previously permitted to have been omitted by Rule 15c2-12, the cover page, all appendices, all information incorporated therein and any amendments or supplements as have been approved by the Authority, the City, and the Underwriter (the “Official Statement”), in sufficient quantity as reasonably requested by the Underwriter to comply with Securities and Exchange Commission Rule 15c2-12(b)(4) and the rules of the Municipal Securities Rulemaking Board (the “MSRB”), complete as of its date of delivery (as amended and supplemented from time to time pursuant to Section 5(f) and Section 6(f) of this Purchase Agreement). The Authority and the City have each approved the use and distribution by the Underwriter of the Official Statement, and the Authority and the City each hereby authorize the use by the Underwriter of the Authority Documents (defined below) and the City Documents (defined below) in connection with the delivery and sale of the Certificates; and

(c) The Underwriter shall not send any confirmation requesting payment for the purchase of any Certificates unless the confirmation is accompanied by or preceded by the delivery of a copy of the Official Statement. The Underwriter shall: (i) provide the Authority and the City with final pricing information on the Certificates upon execution of this Purchase Agreement, (ii) promptly file a copy of the Official Statement, including any amendments or supplements prepared by the Authority and the City with the MSRB, (iii) promptly notify the Authority and the City in writing if the end of the underwriting period (as such term is defined in Rule 15c2-12) does not occur on the date of the Closing (defined herein), and (iv) take any and all other actions necessary to comply with applicable Securities and Exchange Commission rules and MSRB rules governing the offering, sale and delivery of the Certificates to ultimate purchasers.

Section 4. Public Offering. It shall be a condition to the obligation of the Underwriter to purchase, accept delivery of, and pay for the Certificates that the entire $__,___,000 principal amount of the Certificates authorized by the Trust Agreement shall be delivered by the Authority and the City to the Underwriter on the date of the Closing. The Underwriter agrees to make an initial bona fide public offering of all of the Certificates, at not in excess of the initial public offering yields or prices set forth on Schedule I attached hereto, however, the Certificates may be offered and sold to certain dealers (including dealers depositing the Certificates into investment trusts) at prices lower than such initial public offering prices or yields. Following the initial public offering of the Certificates, the offering prices may be changed from time to time by the Underwriter.
Section 5. Representations, Warranties and Covenants of the Authority. The Authority hereby represents to and covenants with the Underwriter that:

(a) By Resolution No. _______, adopted on September 12, 2016 by a majority of the members of the Governing Board of the Authority at a meeting duly called, noticed and conducted, at which a quorum was present and acting throughout (the “Authority Resolution”), the Governing Board of the Authority has taken all action necessary to be taken by it for: (i) execution and delivery of the Trust Agreement, the Lease Agreement, the Site Lease, the Assignment Agreement, dated as of October 1, 2016 (the “Assignment Agreement”), between the Authority as assignor and the Trustee as assignee, the Official Statement, the Tax Certificate of the Authority dated the Closing Date (the “Tax Certificate”), and collectively with the Trust Agreement, the Lease Agreement, the Site Lease, the Assignment Agreement, the Official Statement, and the Tax Certificate, the “Authority Agreements”) and this Purchase Agreement; (ii) distribution of the Preliminary Official Statement and the execution and delivery of the Official Statement; (iii) issuance, sale and delivery of the Certificates; (iv) taking of any and all such action as may be required on the part of the Authority to carry out, give effect to and consummate the transactions contemplated hereby;

(b) The Authority is a joint exercise of powers authority duly organized and existing under the JPA Agreement and the laws of the State of California (the “State”) and has all necessary power and authority to adopt the Authority Resolution and to enter into and perform its duties under the Authority Agreements and this Purchase Agreement and, when executed and delivered by the respective parties thereto, the Trust Agreement will constitute the legal, valid and binding obligation of the Authority enforceable in accordance with its terms, except as enforceability may be limited by bankruptcy, insolvency, moratorium or other laws affecting the enforcement of creditors’ rights generally;

(c) The statements and information contained in the Preliminary Official Statement, as of its date, and the Official Statement, as of its date and the Closing Date, relating to the Authority, its functions, duties and responsibilities are and will be true and correct in all material respects, and the Official Statement does not and will not omit any statement or information which is necessary to make such statements and information therein, in the light of the circumstances under which they were made, not misleading;

(d) No consent, approval, authorization or other action by any governmental or regulatory authority having jurisdiction over the Authority that has not been obtained is or will be required for the execution and delivery of the Authority Agreements and this Purchase Agreement, or the consummation by the Authority of the other transactions contemplated by the Authority Agreements and the Official Statement, except as such may be required for state securities or Blue Sky laws;

(e) The execution and delivery of the Authority Agreements and this Purchase Agreement, and compliance by the Authority with the provisions contained in the Authority Agreements, do not and will not conflict with or constitute a breach of or default under any law, administrative regulation, judgment, decree, lease, indenture, bond, note, resolution, agreement or other instrument to which the Authority is a party or is otherwise subject, nor will any such execution, delivery, adoption or compliance result in the creation or imposition of any lien, charge or other security interest or encumbrance of any nature whatsoever upon any of the properties or assets of the Authority under the terms of any such law, administrative regulation, judgment, decree, lease, indenture, bond, note, resolution, agreement or other instrument, except as provided by the Trust Agreement;
(f) For not more than 25 days from the “end of the underwriting period” (as defined in Securities and Exchange Commission Rule 15c2-12(e)(2)), if an event occurs or facts or conditions become known to the Authority which in the reasonable opinion of the Underwriter, Jones Hall, A Professional Law Corporation (“Disclosure Counsel”), or the Governing Board of the Authority would or might cause the information contained in the Official Statement to be misleading in light of the circumstances existing at the time it is delivered to a purchaser, the Authority shall prepare and furnish to the Underwriter a reasonable number of copies of any amendment of or supplement to the Official Statement (in form and substance satisfactory to the Underwriter, Disclosure Counsel and the Governing Board of the Authority) which will amend or supplement the Official Statement so that it will not contain an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in light of the circumstances existing at the time the amended or supplemented Official Statement is delivered to a purchaser, not misleading. For the purposes of this subsection (f), the Authority shall furnish to the Underwriter such information as it may from time to time request. The Authority may assume that the “end of the underwriting period” for purposes of Securities and Exchange Commission Rule 15c2-12 will occur on the Closing Date unless otherwise notified, in writing, by the Underwriter on or prior to the Closing Date. The Authority shall promptly advise the Underwriter of the institution of any action, suit, proceeding, inquiry or investigation seeking to prohibit, restrain or otherwise affect the use of the Official Statement in connection with the offering, execution or delivery of the Certificates;

(g) The Authority is not in breach of or default under any applicable law or administrative regulation of the State or the United States or any applicable judgment or decree or any lease, indenture, bond, note, resolution, agreement or other instrument to which the Authority is a party or is otherwise subject which would have an adverse impact on the Authority’s ability to perform its obligations under the Certificates, the Authority Agreements, or this Purchase Agreement and no event has occurred and is continuing which, with the passage of time or the giving of notice, or both, would constitute a default or an event of default under any such instrument;

(h) To the best knowledge of the Authority, as of the date hereof, except as disclosed in the Official Statement, there is no action, suit, proceeding, inquiry or investigation, at law or in equity, before or by any court, governmental agency, public board or body, pending or threatened against the Authority affecting the existence of the Authority or the titles of its officers to their respective offices or seeking to prohibit, restrain or enjoin the execution or delivery of the Certificates, the Authority Agreements or this Purchase Agreement, or in any way contesting or affecting the validity or enforceability of the Certificates, the Authority Agreements, or this Purchase Agreement, or contesting in any way the completeness or accuracy of the Official Statement or any amendment or supplement thereto, contesting the status of interest on the Certificates as excludable from federal gross income as described in the Official Statement wherein an unfavorable decision, ruling or finding would materially adversely affect the validity or enforceability of the Certificates, the Authority Agreements, or this Purchase Agreement;

(i) As of the date hereof and up to and including the Closing Date, the Authority will not, without the prior written consent of the Underwriter, publicly offer or issue any bonds, notes or other obligations for borrowed money, or incur any material liabilities, direct or contingent, nor will there be any change of a material nature in the financial position of the Authority, in either case other than the ordinary course of its business or as discussed in the Official Statement;
(j) The Authority will apply, or cause the application of, the proceeds of the Certificates in accordance with the Trust Agreement;

(k) Any certificate signed by any authorized official of the Authority, and delivered to the Underwriter in connection with the execution and delivery of the Certificates, shall be deemed a representation and warranty by the Authority to the Underwriter as to the statements made therein;

(l) The Authority will furnish such information, execute such instruments and take such other action in cooperation with the Underwriter as the Underwriter may reasonably request, to qualify the Certificates for offer and sale under the Blue Sky or other securities laws and regulations of such states and other jurisdictions of the United States as the Underwriter may designate, and will assist, if necessary therefor, in the continuation of such qualifications in effect as long as required for the distribution of the Certificates; provided, however, that the Authority shall not be required to qualify as a foreign corporation or to file any general consents to service of process under the laws of any state; and

(m) The Authority is not in default, and at no time has defaulted in any material respect, on any bond, note or other obligation for borrowed money or any agreement under which any such obligation is or was outstanding.

Section 6. Representations, Warranties and Covenants of the City. The City represents and warrants to the Underwriter that:

(a) The City is a general law city and municipal corporation duly organized and existing under the laws of the State and has all necessary power and authority to enter into and perform its duties under the City Agreements (defined below) and, when duly authorized, executed and delivered by the other parties thereto, the City Agreements will each constitute a legal, valid and binding obligation of the City enforceable in accordance with its respective terms, except as enforceability may be limited by bankruptcy, insolvency, moratorium or other laws affecting the enforcement of creditors’ rights generally;

(b) By Resolution No. __-2016, adopted by a majority of the members of the City Council at a meeting duly called, noticed and conducted, at which a quorum was present and acting throughout, on September 12, 2016 (the “City Resolution”), the City Council of the City has taken all official action necessary to be taken by it for the execution, delivery and due performance of the Trust Agreement, the Escrow Agreement, the Lease Agreement, the Site Lease, the Certificates, the Continuing Disclosure Certificate dated the Closing Date (the “Continuing Disclosure Certificate”) of the City and agreed to and accepted by [U.S. Bancorp Investments, Inc.], as Dissemination Agent (the “Dissemination Agent”) and this Purchase Agreement, and for the taking of any and all such action as may be required on the part of the City to carry out, give effect to and consummate the transactions contemplated hereby. The Trust Agreement, the Escrow Agreement, the Lease Agreement, the Site Lease, and the Continuing Disclosure Certificate are referred to collectively as the “City Agreements;”

(c) The execution and delivery of the City Agreements and this Purchase Agreement and compliance with the provisions of each thereof, will not constitute a breach of or a default under any applicable law or administrative regulation of the State or the United States, or any applicable judgment, decree, agreement or other instrument to which the City is a party or is otherwise subject;

(d) At the time of the City’s acceptance hereof and at all times subsequent thereto up to and including the time of the Closing, the information and statements in Official Statement does not and will not contain any untrue statement of a material fact or omit to state a material fact required to be stated
therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading in any material respect;

(e) To the best knowledge of the City, as of the date hereof, except as disclosed in the Official Statement, there is no action, suit, proceeding or investigation before or by any court, public board or body pending against the City, or to the best knowledge of the City, threatened wherein an unfavorable decision, ruling or finding would: (i) affect the creation, organization, existence or powers of the City, or the titles of its members or officers, (ii) enjoin or restrain the execution and delivery of the City Agreements and this Purchase Agreement, or the pledge of Lease Payments made by the City pursuant the Lease Agreement, (iii) in any way question or affect any of the rights, powers, duties or obligations of the City with respect to the monies pledged or to be pledged to pay the principal of, premium, if any, or interest on the Certificates, (iv) in any way question or affect any authority for the issuance of the Certificates, or the validity or enforceability of the Certificates or the City Agreements, (v) in any way question or affect the City Agreements or this Purchase Agreement, or the transactions contemplated by the Purchase Agreement, the Official Statement, or any other agreement or instrument to which the City is a party relating to the Certificates, or (vi) have a materially adverse effect on the financial condition of the City;

(f) For not more than 25 days from the “end of the underwriting period” (as defined in Securities and Exchange Commission Rule 15c2-12(e)(2)), if an event occurs or facts or conditions become known to the City which in the reasonable opinion of Disclosure Counsel or the City Attorney would or might cause the information contained in the Official Statement to be misleading in light of the circumstances existing at the time it is delivered to a purchaser, the City shall prepare and furnish to the Underwriter a reasonable number of copies of any amendment of or supplement to the Official Statement (in form and substance satisfactory to the Underwriter, Disclosure Counsel and the City Attorney) which will amend or supplement the Official Statement so that it will not contain an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in light of the circumstances existing at the time the amended or supplemented Official Statement is delivered to a purchaser, not misleading. For the purposes of this subsection (f), the City shall furnish to the Underwriter such information as it may from time to time request. The City may assume that the “end of the underwriting period” for purposes of Securities and Exchange Commission Rule 15c2-12 will occur on the Closing Date unless otherwise notified, in writing, by the Underwriter on or prior to the Closing Date. The City shall promptly advise the Underwriter of the institution of any action, suit, proceeding, inquiry or investigation seeking to prohibit, restrain or otherwise affect the use of the Official Statement in connection with the offering, execution or delivery of the Certificates;

(g) Except as may be required under Blue Sky or other securities laws of any state, there is no consent, approval, authorization or other order of, or filing or registration with, or certification by, any regulatory authority having jurisdiction over the City required for the approval and delivery of this Purchase Agreement or the consummation by the City of the other transactions contemplated by the City Agreements that has not been obtained;

(h) There is no action, suit, proceeding, inquiry or investigation at law or in equity, before or by any court or governmental or public entity pending or threatened against the City which affects or seeks to prohibit, restrain or enjoin the execution or delivery of the Certificates, or contesting the powers of the City to enter into or perform its obligations under any of the City Agreements or the existence or powers of the City;
(i) If the information contained in the Official Statement is amended or supplemented pursuant to the Section 6(f), at the time of each supplement or amendment thereto and (unless subsequently supplemented or amended pursuant to such subparagraph) at all times subsequent thereto up to and including the date of the Closing, the portions of the Official Statement so supplemented or amended (including any financial and statistical data contained therein) will not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make such information therein concerning the City or the affairs of the City, in the light of the circumstances under which it was presented, not misleading;

(j) The City shall furnish or cause to be furnished to the Underwriter, in such quantities as shall be reasonably required by the Underwriter, copies of the Official Statement and all amendments and supplements thereto, in each case as soon as available;

(k) Any certificate signed by any official of the City authorized to do so shall be deemed a representation and warranty by the City to the Underwriter as to the statements made therein;

(l) The City shall apply a portion of the proceeds of the Certificates, including the investment earnings thereon, as described in the Official Statement;

(m) The City is not in default, and at no time has defaulted in any material respect, on any bond, note or other obligation for borrowed money or any agreement under which any such obligation is or was outstanding;

(n) Except as disclosed in the Official Statement or otherwise disclosed in writing to the Underwriter, there has not been any materially adverse change in the financial condition of the City since June 30, 2015 and there has been no occurrence, circumstance or combination thereof which is reasonably expected to result in any such materially adverse change. The financial statements of, and other financial information, regarding the City contained in the Official Statement fairly present the financial position and results of the operations of the City as of the dates and for the periods therein set forth (i) the audited financial statements have been prepared in accordance with the generally accepted accounting principles consistently applied, and (ii) the other financial information in the Official Statement has been determined on a basis substantially consistent with that of the audited financial statements for the City included in the Official Statement;

(o) The City is currently in compliance with all of its prior continuing disclosure undertakings entered into pursuant to Rule 15c2-12 and at or prior to the Closing Date, the City shall have duly authorized, executed and delivered the Continuing Disclosure Certificate. Since Fiscal Year 2010-11, specific instances of noncompliance with prior undertakings by the City, on its own behalf, and as the successor agency to the Redevelopment Agency of the City of Pacifica with respect to one outstanding issue of tax increment bonds, include: (i) late and/or incomplete filings of annual reports containing annual financial and operating information for Fiscal Years 2010-11 through 2014-15; (ii) late filing of audited financial statements for Fiscal Year 2013-14, and failure to file a notice of late filing in connection therewith; (iii) failure to file certain required supplemental information that was not included in the filed audits or comprehensive annual reports; (iv) late or failure to file notices of numerous underlying and/or bond insurer ratings changes. The City caused remedial filings to be made on October 31, 2014, May 19, 2016, June 10, 2016, July 8, 2016, and ________, 2016. [The City has engaged the Dissemination Agent to ensure ongoing and future compliance with its obligations under Rule 15c2-12 and the City Council adopted drafting formal Disclosure Policies and Procedures for consideration and adoption by the City Council. A description of the continuing disclosure undertaking
by the City in connection with the Certificates is set forth in the Preliminary Official Statement and will also be set forth in the Official Statement.]

(p) The City shall cooperate with the Underwriter to qualify the Certificates for offer and sale under the securities or Blue Sky laws of as many jurisdictions within the United States as the Underwriter may request; provided, however, that the City will not be required to expend any of its own funds in connection with such qualifications and will not be required to consent to service of process in any such jurisdiction in which it is not now subject to service of process or to qualify as a broker or a foreign corporation in connection with any such qualification in any jurisdiction;

(q) The City covenants that it shall not take any action which would cause interest payable with respect to the Certificates to be subject to federal income taxation or State personal income taxation; and

(r) The City acknowledges that it previously received a letter from the Underwriter dated May 4, 2016 regarding MSRB Rule G-17 disclosures, and that the City has provided to the Underwriter acknowledgement of such letter.

Section 7. Closing.

(a) At 8:00 A.M., California time, on October 3, 2016, or on such earlier or later date as may be agreed upon by the Underwriter and the City (the "Closing Date"), the Authority will deliver or cause to be delivered to the Underwriter, through the facilities of The Depository Trust Company in New York, New York ("DTC"), by initial deposit with the Trustee (in care of DTC) through DTC’s Fast Automated Securities Transfer ("F.A.S.T") procedures, the Certificates in definitive form, duly executed, and at the offices of Jones Hall, A Professional Law Corporation in San Francisco, California ("Special Counsel"), or such other place as shall have been mutually agreed upon by the Underwriter and the Authority, the other documents described herein, and pay the purchase price of the Certificates as set forth in Section 1 of this Purchase Agreement in immediately available funds to the order of the Trustee. Such payment and delivery, together with the delivery of the aforementioned documents, is herein called the "Closing."

(b) The Certificates shall be issued in fully registered form. It is anticipated that CUSIP identification numbers will be inserted on the Certificates, but neither the failure to provide such numbers nor any error with respect thereto shall constitute a cause for failure or refusal by the Underwriter to accept delivery of the Certificates in accordance with the terms of this Purchase Agreement.

Section 8. Further Conditions to the Purchase of the Certificates. The Underwriter enters into this Purchase Agreement in reliance upon the representations, warranties and agreements of the Authority and of the City contained herein and to be contained in the documents and instruments to be delivered at Closing, and upon the performance by the Authority and the City of their respective obligations hereunder, both as of the date hereof and as of the Closing Date. Accordingly, the obligations of the Underwriter under this Purchase Agreement to purchase, to accept delivery of and to pay for the Certificates shall be subject to the performance by the Authority and the City of their respective obligations to be performed hereunder and under such documents and instruments at or prior to the Closing Date, and shall also be subject to the following conditions:

(a) The representations and warranties of the Authority and the City contained herein shall be true, accurate and complete on the date hereof and on and as of the Closing Date, as if made on the Closing Date;
(b) At the time of Closing (i) each of the Authority Agreements and the City Agreements shall be in full force and effect, and shall not have been amended, modified or supplemented, except as may have been agreed to by the Authority, the City and Underwriter, (ii) the Authority and the City shall each perform or have performed all of their obligations required under or specified in the Authority Agreements or the City Agreements, respectively, to be performed by the respective party at or prior to the Closing Date, and (iii) the Official Statement shall not have been amended without the consent of the Underwriter;

(c) As of the Closing Date, all necessary official action of the Authority and the City relating to the Certificates, the Authority Agreements, and the City Agreements, respectively, shall have been taken by the respective party and shall be in full force and effect and shall not have been amended, modified or supplemented in any material respect;

(d) The Underwriter shall have the right to terminate its obligations under this Purchase Agreement to purchase, to accept delivery of and to pay for the Certificates by notifying the City of its election to do so if, after the execution hereof and prior to Closing:

(i) the marketability of the Certificates or the market price thereof, in the opinion of the Underwriter, has been materially and adversely affected by any decision issued by a court of the United States (including the United States Tax Court) or of the State, by any ruling or regulation (final, temporary or proposed) issued by or on behalf of the Department of the Treasury of the United States, the Internal Revenue Service, or other governmental agency of the United States, or by a tentative decision or announcement by any member of the House Ways and Means Committee, the Senate Finance Committee, or the Conference Committee with respect to contemplated legislation or by legislation enacted by, pending in, or favorably reported to either the House of Representatives or either House of the Legislature of the State, or formally proposed to the Congress of the United States by the President of the United States or to the Legislature of the State by the Governor of the State in an executive communication, affecting the tax status of the City, its property or income, its bonds or the interest thereon or any tax exemption granted or authorized by the Act;

(ii) the United States shall have become engaged in hostilities which have resulted in a declaration of war or a national emergency, or there shall have occurred any other outbreak or escalation of hostilities, or a local, national or international calamity or crisis, financial or otherwise, the effect of such outbreak or escalation, calamity or crisis being such as, in the reasonable opinion of the Underwriter, would affect materially and adversely the ability of the Underwriter to market the Certificates;

(iii) there shall have occurred a general suspension of trading on the New York Stock Exchange or the declaration of a general banking moratorium by the United States, the State of New York or State authorities;

(iv) a stop order, ruling, regulation or official statement by, or on behalf of, the Securities and Exchange Commission shall be issued or made to the effect that the issuance, offering or sale of the Certificates is or would be in violation of any provision of the Securities Act of 1933, as then in effect, or of the Securities Exchange Act of 1934, as then in effect, or of the Trust Indenture Act of 1939, as then in effect;

(v) legislation shall be enacted by the House of Representatives or the Senate of the Congress of the United States of America, or a decision by a court of the United States of
America shall be rendered, or a ruling or regulation by or on behalf of the Securities and Exchange Commission or other governmental agency having jurisdiction of the subject matter shall be made or proposed to the effect that the Certificates are not exempt from registration, qualification or other similar requirements of the Securities Act of 1933, as then in effect, or of the Trust Indenture Act of 1939, as then in effect;

(vi) in the reasonable judgment of the Underwriter, the market price of the Certificates, or the market price generally of obligations of the general character of the Certificates, might be materially and adversely affected because additional material restrictions not in force as of the date hereof shall have been imposed upon trading in securities generally by any governmental authority or by any national securities exchange;

(vii) there shall have occurred or any notice shall have been given of any intended review, downgrading, suspension, withdrawal, or negative change in credit watch status by any national rating service to the Certificates or any of the obligations of the Authority or the City, which, in the reasonable opinion of the Underwriter, materially adversely affects the marketability or market price of the Certificates;

(viii) the Comptroller of the Currency, The New York Stock Exchange, or other national securities exchange, or any governmental authority, shall impose, as to the Certificates or obligations of the general character of the Certificates, any material restrictions not now in force, or increase materially those now in force, with respect to the extension of credit by, or the charge to the net capital requirements of, or financial responsibility requirements of the Underwriter;

(ix) any legislation, ordinance, rule or regulation shall be introduced in or be enacted by any governmental body, department or agency in the State or a decision of a court of competent jurisdiction within the State shall be rendered, which, in the reasonable opinion of the Underwriter, after consultation with the Authority and the City, materially adversely affects the market price of the Certificates;

(x) an event occurs which in the reasonable opinion of the Underwriter make untrue in any material respect any information or statement contained in the Official Statement, or has the effect that the Official Statement contains any untrue statement of a material fact or omits to state a material fact required or necessary to be stated therein in order to make the statements contained therein not misleading in light of the circumstances under which they were made; or

(xi) any fact or event shall exist or have existed that requires or has required an amendment of or supplement to the Official Statement which, in the reasonable judgment of the Underwriter, materially adversely affects the marketability or market price of the Certificates.

(e) At or prior to Closing, the Underwriter shall have received each of the following documents:

(i) Authority Resolution, JPA Agreement and Authority Agreements. A certified copy of the Authority Resolution and the JPA Agreement, and executed copies of the Authority Agreements;
(ii) **City Resolution and City Agreements.** A certified copy of the City Resolution and executed copies of the City Agreements;

(iii) **Preliminary and Final Official Statements.** The Preliminary Official Statement and the Official Statement, with the Official Statement executed by duly authorized officers of the Authority and the City;

(iv) **Continuing Disclosure Certificate.** The Continuing Disclosure Certificate, executed on behalf of the City by a duly authorized officer of the City and the Dissemination Agent;

(v) **Opinion of Special Counsel.** An approving opinion of Special Counsel, dated the Closing Date, substantially in the form attached as Appendix __ to the Official Statement, and a reliance letter with respect thereto addressed to the Underwriter;

(vi) **Supplemental Opinion of Special Counsel.** A supplemental opinion of Special Counsel, addressed to the Underwriter, to the effect that: (i) the Certificates are not subject to the registration requirements of the Securities Act of 1933, as amended, and the Trust Agreement is exempt from qualification under the Trust Indenture Act of 1939, as amended; and (ii) the statements contained in the Official Statement under the captions “INTRODUCTION–Security and Sources of Payment,” “–Tax Matters,” “THE CERTIFICATES” and “SECURITY AND SOURCES OF PAYMENT FOR THE CERTIFICATES” are accurate in all material respects insofar as such statements summarize certain provisions of the Trust Agreement, and the Certificates, and the statements contained in the Official Statement under the caption “TAX MATTERS,” insofar as such statements summarize the legal opinion and certain provisions of federal and State law, are accurate in all material respects;

(vii) **Defeasance Opinion of Special Counsel.** An opinion of Special Counsel, dated the Closing Date, and addressed to the Authority, the City, and the Underwriter, in form and substance satisfactory to the Authority, the City, and the Underwriter, to the effect that the 2008 Certificates have been defeased and such certificates are no longer deemed outstanding pursuant to the Trust Agreement dated of May 1, 2006, by and among the City, the Authority and Wells Fargo Bank, National Association, as trustee, as amended and restated by the Amended and Restated Trust Agreement, dated as of August 1, 2008 by and among the City, the Authority and Deutsche Bank National Trust Company, as trustee;

(viii) **Opinion of Counsel to the Authority.** An opinion of the City Attorney as counsel to the Authority, dated the Closing Date, and addressed to the Underwriter in substantially the form of Exhibit B;

(ix) **Opinion of City Attorney.** An opinion of the City Attorney, dated the Closing Date, and addressed to the Underwriter in substantially the form of Exhibit C;

(x) **Opinion of Disclosure Counsel.** The opinion of Disclosure Counsel, dated the Closing Date and addressed to the Authority, the City, and the Underwriter, to the effect that, based upon the information made available to them in the course of their participation in the preparation of the Official Statement and without passing on and without assuming any responsibility for the accuracy, completeness and fairness of the statements in the Official Statement, and having made no independent investigation or verification thereof, no facts have come to their attention that lead them to believe that, as of the Closing Date, the Official
Statement (except for information relating to the book-entry only system and any financial or statistical data or forecasts, numbers, charts, estimates, projections, assumptions or expressions of opinion, as to which no opinion or view need be expressed) contains any untrue statement of a material fact or omits to state any material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading and that the Certificates are exempt from registration under the Securities Act and the Trust Agreement is exempt from qualification pursuant to the Trust Indenture Act of 1939, as amended;

(xi) **Opinion of Underwriter’s Counsel.** The opinion of Schiff Hardin LLP, as counsel to the Underwriter, dated the Closing Date and addressed to the Underwriter, to the effect that, based upon the information made available to them in the course of their participation in the preparation of the Official Statement and without passing on and without assuming any responsibility for the accuracy, completeness and fairness of the statements in the Official Statement, and having made no independent investigation or verification thereof, no facts have come to their attention that lead them to believe that, as of the Closing Date, the Official Statement (except for any information relating to DTC, Cede & Co., the book-entry only system and any financial or statistical data or forecasts, numbers, charts, estimates, projections, assumptions or expressions of opinion, as to which no opinion or view need be expressed) contains any untrue statement of a material fact or omits to state any material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading and that the Certificates are exempt from registration under the Securities Act and the Trust Agreement is exempt from qualification pursuant to the Trust Indenture Act of 1939, as amended, and that the Continuing Disclosure Certificate provides a suitable basis for the Underwriter, in connection with the Offering (as defined in the Securities and Exchange Commission Rule 15c2-12) of the Certificates, to make a reasonable determination as required by section (b)(5) of said Rule;

(xii) **Closing Certificate of the Authority.** A certificate from a duly authorized official of the Authority, dated the Closing Date to the effect that:

(A) The representations and warranties of the Authority contained in this Purchase Agreement are true and correct in all material respects on and as of the Closing Date as if made on the Closing Date;

(B) No event affecting the Authority has occurred since the date of the Official Statement which should be disclosed in the Official Statement in order to make the statements therein, in light of the circumstances under which they were made not misleading in any respect; and

(C) No litigation is pending or threatened (a) to restrain or enjoin the execution or delivery of the Authority Agreements or this Purchase Agreement, or contesting or affecting the validity of the Authority Resolution, the Certificates, the Lease Payments, the Authority Agreements, or this Purchase Agreement, or (b) in any way contesting the existence or powers of the Authority;

(xiii) **Closing Certificate of the City.** A certificate from a duly authorized official of the City, dated the Closing Date to the effect that:
(A) The representations and warranties of the City contained in Section 6 of the Purchase Agreement are true and correct in all material respects on and as of the Closing Date as if made on the Closing Date;

(B) No event affecting the City has occurred since the date of the Official Statement which should be disclosed in the Official Statement in order to make the statements therein, in light of the circumstances in which they were made, not misleading; and

(C) No litigation is pending or threatened (a) to restrain or enjoin the issuance, sale or delivery of the Certificates, or contesting or affecting the validity of the City Resolution, the Certificates, the Lease Payments, the City Agreements, or this Purchase Agreement, or (c) in any way contesting the existence or powers of the City;

(xiv) Certificate of the Trustee. A certificate of the Trustee dated the Closing Date, to the effect that:

(A) The Trustee is a national banking association duly organized and validly existing under the laws of the United States of America, and has full power and is qualified to accept and comply with the terms of the Trust Agreement and Escrow Agreement and to perform its respective obligations stated therein;

(B) The Trustee has accepted the respective duties and obligations imposed on it by the Trust Agreement and Escrow Agreement;

(C) No consent, approval, authorization or other action by any governmental or regulatory authority having jurisdiction over the Trustee that has not been obtained is or will be required for the consummation by the Trustee of the transactions contemplated by the Trust Agreement, the Certificates, or the Escrow Agreement to be undertaken by the Trustee;

(D) Compliance with the terms of the Trust Agreement, the Certificates, and the Escrow Agreement will not conflict with, or result in a violation or breach of, or constitute a default under, any loan agreement, indenture, bond, note, resolution or any other agreement or instrument to which the Trustee is a party or by which it is bound, or, to the best knowledge of the Trustee, after reasonable investigation, any law, rule, regulation, order or decree of any court or governmental agency or body having jurisdiction over the Trustee or any of its activities or properties (except that no representation, warranty or agreement is made by the Trustee with respect to any federal or State securities or Blue Sky laws or regulations); and

(E) To the best knowledge of the Trustee, there is no action, suit, proceeding, inquiry or investigation, at law or in equity, before or by any court or governmental agency, public board or body served on or threatened against or affecting the existence of the Trustee, or in any way contesting or affecting the validity or enforceability of the Trust Agreement, the Certificates, or the Escrow Agreement, or contesting the powers of the Trustee or its authority to enter into and perform its obligations under the Trust Agreement or the Certificates, wherein an unfavorable decision, ruling or finding would
adversely affect the validity of the Trust Agreement, the Certificates, or Escrow Agreement;

(xv)  **Opinion of Counsel to the Trustee and the Escrow Agent.** The opinion of Counsel to the Trustee, dated the Closing Date, addressed to the City and the Underwriter, to the effect that:

(A) The Trustee is a national banking association duly organized and validly existing and in good standing under the laws of the United States of America and has full power and authority to execute and deliver the Trust Agreement, the Certificates, and the Escrow Agreement and to perform its respective obligations thereunder; and

(B) The Trust Agreement, the Certificates, and the Escrow Agreement, each executed and delivered by the Trustee, constitute a valid and binding obligations of the Trustee enforceable against the Trustee in accordance with their respective terms, except insofar as the validity, binding nature and enforceability of the obligations of the Trustee under such agreements may be limited by the effect of (a) insolvency, reorganization, arrangement, moratorium, fraudulent transfer and other similar laws, (b) the discretion of any court of competent jurisdiction in awarding equitable remedies, including, without limitation, specific performance or injunctive relief, and (b) the effect of general principles of equity embodied in California statutes and common law;

(C) No consent, approval, authorization or other action by any governmental or regulatory authority having jurisdiction over the Trustee that has not been obtained is or will be required for the consummation by the Trustee of the transactions contemplated by the Trust Agreement, the Certificates, or the Escrow Agreement to be undertaken by the Trustee;

(D) Compliance with the terms of the Trust Agreement or the Certificates will not conflict with, or result in a violation or breach of, or constitute a default under, any loan agreement, indenture, bond, note, resolution or any other agreement or instrument to which the Trustee is a party or by which it is bound, or, to the best knowledge of the Trustee, after reasonable investigation, any law, rule, regulation, order or decree of any court or governmental agency or body having jurisdiction over the Trustee or any of its activities or properties (except that no representation, warranty or agreement is made by the Trustee with respect to any federal or State securities or Blue Sky laws or regulations); and

(E) To the best knowledge of such counsel, there is no action, suit, proceeding, inquiry or investigation, at law or in equity, before or by any court or governmental agency, public board or body served on or threatened against or affecting the existence of the Trustee, or in any way contesting or affecting the validity or enforceability of the Trust Agreement, the Certificates, or the Escrow Agreement, or contesting the powers of the Trustee or its authority to enter into and perform its obligations under the Trust Agreement, the Certificates, or the Escrow Agreement, wherein an unfavorable decision, ruling or finding would adversely affect the validity of the Trust Agreement, the Certificates, or the Escrow Agreement.
(xvi) **Certificate of the Escrow Agent.** A certificate of U.S. Bancorp Investments, Inc., dated the Closing Date, to the effect that:

(A) The Escrow Agent is a national banking association duly organized and validly existing under the laws of the United States of America, and has full power and is qualified to accept and comply with the terms of the Escrow Agreement and to perform its respective obligations stated therein;

(B) The Escrow Agent has accepted the respective duties and obligations imposed on it by the Escrow Agreement;

(C) No consent, approval, authorization or other action by any governmental or regulatory authority having jurisdiction over the Escrow Agent that has not been obtained is or will be required for the consummation by the Escrow Agent of the transactions contemplated by the Trust Agreement or the Escrow Agreement to be undertaken by the Escrow Agent;

(D) Compliance with the terms of the Escrow Agreement will not conflict with, or result in a violation or breach of, or constitute a default under, any loan agreement, indenture, bond, note, resolution or any other agreement or instrument to which the Escrow Agent is a party or by which it is bound, or, to the best knowledge of the Escrow Agent, after reasonable investigation, any law, rule, regulation, order or decree of any court or governmental agency or body having jurisdiction over the Escrow Agent or any of its activities or properties (except that no representation, warranty or agreement is made by the Escrow Agent with respect to any federal or State securities or Blue Sky laws or regulations); and

(E) To the best knowledge of the Escrow Agent, there is no action, suit, proceeding, inquiry or investigation, at law or in equity, before or by any court or governmental agency, public board or body served on or threatened against or affecting the existence of the Escrow Agent, or in any way contesting or affecting the validity or enforceability of the Escrow Agreement or contesting the powers of the Escrow Agent or its authority to enter into and perform its obligations under the Escrow Agreement, wherein an unfavorable decision, ruling or finding would adversely affect the validity of the Escrow Agreement;

(xvii) **Tax Certificate.** A Tax Certificate of the City, executed on behalf of the City by a duly authorized officer;

(xviii) **IRS Form 8038-G.** Evidence that the federal tax information form 8038-G with respect to the Certificates has been prepared for filing;

(xix) **Rating Letter.** A rating letter from Standard & Poor’s Financial Services LLC, a subsidiary of The McGraw-Hill Companies, Inc. indicating that the Certificates have been rated “AA-”;

(xx) **CDIAC Notices of Sale.** Evidence of required filings with the California Debt and Investment Advisory Commission;
(xxi) **Title Policy.** A CLTA Policy insuring the leasehold interest of the City in the Leased Property;

(xxii) **DTC Blanket Letter of Representations.** A copy of the Blanket Letter of Representations executed by the City and delivered to The Depository Trust Company, New York, New York, relating to the book-entry system for the Certificates;

(xxiii) **Certificate of the Risk Manager.** A Certificate of the Risk Manager of the City with respect to the Leased Property evidencing that the insurance required by Article IV of the Lease Agreement has been procured and is in full force and effect; and

(xxiv) **Additional Documents.** Such additional legal opinions, certificates, instruments and documents as the Underwriter may reasonably request to evidence the truth and accuracy, as of the date hereof and as of the Closing Date, of the City’s representations and warranties contained herein and of the statements and information contained in the Official Statement and the due performance or satisfaction by the City on or prior to the Closing Date of all agreements then to be performed and all conditions then to be satisfied by the City.

All of the opinions, letters, certificates, instruments and other documents mentioned above or elsewhere in this Purchase Agreement shall be deemed to be in compliance with the provisions hereof if, but only if, they are in form and substance satisfactory to the Special Counsel. Receipt of, and payment for, the Certificates shall constitute evidence of the satisfactory nature of such as to the Underwriter. The performance of any and all obligations of the City hereunder and the performance of any and all conditions contained herein for the benefit of the Underwriter may be waived by the Underwriter in its sole discretion.

If the Authority and the City shall be unable to satisfy their respective conditions to the obligations of the Underwriter to purchase, accept delivery of and pay for the Certificates contained in this Purchase Agreement, or if the obligations of the Underwriter to purchase, accept delivery of and pay for the Certificates shall be terminated for any reason permitted by this Purchase Agreement, this Purchase Agreement shall terminate, and none of the Underwriter, the Authority, and the City shall be under further obligation hereunder, except that the respective obligations of the Authority, the City, and the Underwriter set forth in Section 9 hereof shall continue in full force and effect.

Section 8. **Changes in Official Statement.** After the Closing, the Authority and the City will not adopt any amendment of or supplement to the Official Statement to which the Underwriter shall object in writing. Within 90 days after the Closing Date or within 25 days following the end of the underwriting period, whichever occurs first, if any event relating to or affecting the Certificates, the Trustee or the City shall occur as a result of which it is necessary, in the opinion of the Underwriter, to amend or supplement the Official Statement in order to make the Official Statement not misleading in any material respect in the light of the circumstances existing at the time it is delivered to a purchaser, the Authority and the City will forthwith prepare and furnish to the Underwriter an amendment or supplement that will amend or supplement the Official Statement so that it will not contain an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances existing at the time the Official Statement is delivered to purchaser, not misleading. The Authority and the City shall cooperate with the Underwriter in the filing by the Underwriter of such amendment or supplement to the Official Statement with a nationally recognized municipal securities repository. For the purposes of this section the Authority and the City will furnish such information with respect to itself as the Underwriter may reasonably request from time to time during such period.
Section 9. Expenses.

(a) The Underwriter shall be under no obligation to pay, and the Authority and the City shall pay the following expenses incident to the performance of their obligations hereunder: (i) the fees and disbursements of Special Counsel, Disclosure Counsel, Backstrom McCarley Berry & Co., LLC, as financial advisor to the Authority, the City, the Trustee, the Escrow Agent, [and the Dissemination Agent]; (ii) the cost of printing and delivering the Certificates, the Preliminary Official Statement and the Official Statement (and any amendment or supplement prepared pursuant to Section 5(f) or Section 6(f) of this Purchase Agreement); (iii) the rating agencies, accountants, advisers and of any other experts or consultants retained by the Authority or the City; and (iv) any other expenses and costs of the Authority or the City incident to the performance of their respective obligations in connection with the authorization, issuance and sale of the Certificates, including out-of-pocket expenses and regulatory expenses, and any other expenses agreed to by the parties.

(b) The Underwriter shall pay all expenses incurred by them in connection with the public offering and distribution of the Certificates including, but not limited to: (i) all advertising expenses in connection with the offering of the Certificates; (ii) the fees and expenses of Underwriter’s Counsel and (iii) all out-of-pocket disbursements and expenses incurred by the Underwriter in connection with the offering and distribution of the Certificates (including travel and other expenses, CUSIP Service Bureau fees, fees of the California Debt and Investment Advisory Commission and any other fees and expenses), except as provided in (a) above or as otherwise agreed to by the Underwriter, the Authority, and the City.

Section 10. Notices. Any notice or other communication to be given to the Authority or the City under this Purchase Agreement may be given by delivering the same in writing at the addresses set forth above, and any notice or other communication to be given to the Underwriter under this Purchase Agreement may be given by delivering the same in writing to: U.S. Bancorp Investments, Inc., One California Street, Suite 350, San Francisco, California 94111; Attention: Scott Nagelson, Managing Director.

Section 11. Parties in Interest; Survival of Representations and Warranties. This Purchase Agreement is made solely for the benefit of the Authority, the City, and the Underwriter (including their successors and assigns), and no other person shall acquire or have any right hereunder or by virtue hereof. All of the representations, warranties and agreements of the Authority and the City contained in this Purchase Agreement shall remain operative and in full force and effect regardless of: (a) any investigations made by or on behalf of the Underwriter; or (b) delivery of and payment for the Certificates pursuant to this Purchase Agreement. The agreements contained in this Section 11 and in Section 10 shall survive any termination of this Purchase Agreement.

Section 12. Severability. In the event that any provision of this Purchase Agreement shall be held invalid or unenforceable by any court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provision of this Purchase Agreement.

Section 13. Governing Law; Venue. This Purchase Agreement shall be governed and interpreted exclusively by and construed in accordance with the laws of the State applicable to contracts made and to be performed in the State. Any and all disputes or legal actions or proceedings arising out of this Purchase Agreement or any document related hereto shall be filed and maintained in a court of competent jurisdiction in the City of Pacifica; provided that the Authority and the City may waive the requirement of venue. By execution of and delivery of this Purchase Agreement, the parties hereto accept and consent to the aforesaid jurisdiction.
Section 14. **Counterparts.** This Purchase Agreement may be executed in any number of counterparts, all of which taken together shall constitute one agreement, and any of the parties hereto may execute the Purchase Agreement by signing any such counterpart.

Section 15. **Prior Agreements.** The parties agree that the terms and conditions of this Purchase Agreement supersede those of all previous agreements between the parties, and that this Purchase Agreement contains the entire agreement between the parties hereto. In the event of a dispute between the parties under this Purchase Agreement, the losing party in such dispute shall pay all reasonable costs and expenses incurred by the prevailing party in connection therewith, including but not limited to attorneys’ fees.

Section 16. **Headings.** The headings of the Sections of this Purchase Agreement are inserted for convenience only and shall not be deemed to be a part hereof.

Section 17. **Entire Agreement.** The parties agree that the terms and conditions of this Purchase Agreement supersede those of all previous agreements between the parties, and that this Purchase Agreement contains the entire agreement between the parties hereto. In the event of a dispute between the parties under this Purchase Agreement, the losing party in such dispute shall pay all reasonable costs and expenses incurred by the prevailing party in connection therewith, including but not limited to attorneys’ fees.

(Remainder of this Page Intentionally Left Blank)
Section 18. Effectiveness. This Purchase Agreement shall be effective as of the date set forth above upon the execution of the acceptance hereof by authorized officers of the Authority and of the City, and shall be valid and enforceable as of the time of such acceptance.

Very truly yours,

U.S. BANCORP INVESTMENTS, INC.

By:____________________________________
Scott Nagelson
Managing Director

ACCEPTED and AGREED to at
_________ Pacific Time
On September __, 2016:

CITY OF PACIFICA FINANCING AUTHORITY

By:____________________________________
Executive Director

CITY OF PACIFICA

By:____________________________________
City Manager
SCHEDULE I

MATURITIES, AMOUNTS, RATES, YIELDS AND PRICES

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<th>Maturity (January 1)</th>
<th>Principal Amount</th>
<th>Interest Rate</th>
<th>Yield</th>
<th>Price</th>
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PREPAYMENT PROVISIONS

The Certificates maturing on or before January 1, 20__, are not subject to optional prepayment before their respective stated maturities. The Certificates maturing on or after January 1, 20__, are subject to prepayment prior to their respective stated maturities, at the option of the City, in whole, or in part among maturities on such basis as designated by the City and by lot within any one maturity on January 1, 20__, or on any date thereafter, upon payment of a prepayment price equal to 100% of the principal amount to be prepaid, together with accrued interest to the date fixed for prepayment, without premium.
EXHIBIT A

CITY OF PACIFICA
2016 REFUNDING CERTIFICATES OF PARTICIPATION
(2008 CERTIFICATES REFUNDING)

FORM OF THE CERTIFICATE REGARDING THE PRELIMINARY OFFICIAL STATEMENT

The undersigned hereby states and certifies:

1. That she is the duly qualified and acting Executive Director of the City of Pacifica Financing Authority (the “Authority”) and the City Manager of the City of Pacifica (the “City”) as such, is familiar with the facts herein certified and is authorized and qualified to certify the same;

2. That there has been delivered to U.S. Bancorp Investments, Inc., as underwriter (the “Underwriter”) of the captioned Certificates, a Preliminary Official Statement, relative to the captioned Certificates, dated September __, 2016 (including the cover page and all appendices thereto, in electronic form, the “Preliminary Official Statement”), which the City deems final as of its date for purposes of Rule 15c2-12 promulgated under the Securities Exchange Act of 1934, as amended (“Rule 15c2-12”), except for the offering price(s), interest rate(s), selling compensation, aggregate principal amount, principal amount per maturity, delivery dates and other terms of the Certificates depending on such matters permitted to be omitted therefrom by Rule 15c2-12; and

3. The Authority and the City hereby approve the use and distribution by the Underwriter of
the Preliminary Official Statement.

Dated: September __, 2016

CITY OF PACIFICA FINANCING AUTHORITY

By:_______________________________________
Executive Director

CITY OF PACIFICA

By:_______________________________________
City Manager
EXHIBIT B

FORM OF OPINION OF CITY ATTORNEY

[Closing Date]

U.S. Bancorp Investments, Inc.
One California Street, Suite 350
San Francisco, California 94111

Re: City of Pacifica 2016 Refunding Certificates of Participation (2008 Certificates Refunding)

Ladies and Gentlemen:

I am the City Attorney of the City of Pacific Financing Authority (the “Authority”) and have acted as such in connection with the issuance of the above-referenced Certificates (the “Certificates”). This opinion letter is rendered in satisfaction of the requirements of Section 7(e)(vii) of the Certificate Purchase Agreement dated September __, 2016 (the “Purchase Agreement”), by and among U.S. Bancorp Investments, Inc., the Authority, and the City of Pacifica (the “City”), providing for the purchase of the Certificates. The Certificates are being issued pursuant to a Trust Agreement (the “Trust Agreement”) dated as of October 1, 2016 among the Authority, the City, and U.S. Bancorp Investments, Inc., as trustee.

In rendering the opinions set forth herein, we have examined and relied upon originals or copies of the following:

(i) The Joint Exercise of Powers Agreement dated as of October 14, 1996 (the “JPA Agreement”) between the [Successor Agency to the City of Pacifica Redevelopment Agency, formerly known as the] Redevelopment Agency of the City of Pacifica, and the City;

(ii) Resolution No. _____, adopted by the Governing Board of the Authority on September 12, 2016 (the “Authorizing Resolution”);

(iii) The Trust Agreement;

(iv) The Amended and Restated Lease Agreement dated as of October 1, 2016 (the “Lease Agreement”), by and between the City and the Authority;

(v) The Amended and Restated Site Lease, dated as of October 1, 2016 (the “Site Lease”);

(vi) The Purchase Agreement; and

(vii) The Official Statement dated September __, 2016, relating to the Certificates (the “Official Statement”).
For the purposes of this opinion letter, except as necessary to render the opinions set forth herein, we have not undertaken examination of any public records or other documents not specifically referred to above. We have assumed that (1) all documents submitted to us as copies conform to the original documents, and the originals of such copies are authentic, and (2) all of the above-referenced documents are accurate and complete.

Our opinions set forth herein do not extend to, and we express no opinions herein with respect to, any laws other than the laws of the State of California, but exclusive of the tax and securities laws, rules and regulations of the State of California and the laws of the State of California relating to debt limitations and restrictions applicable to public entities.

Whenever a statement herein is qualified by “to the best of our knowledge” or similar phrase, it is intended to indicate that, during the course of our representation of the Authority in connection with the transactions described herein, no information that would give us current actual knowledge of the inaccuracy of such statement has come to our attention. However, unless otherwise noted herein, we have not undertaken any independent investigation to determine the accuracy of such statement, and any documents and matters described in this opinion and in the preparation of this opinion letter should not be regarded as such an investigation. Furthermore, no inference as to our knowledge of any matters bearing on the accuracy of any such statement should be drawn from the fact of our continued representation of the Authority, either past or present.

Our opinions expressed herein may be affected by actions taken or events occurring after the date hereof. As to questions of fact material to our opinions, we have relied upon representations by the principal officers of the Authority.

On the basis of, and subject to and in reliance upon, the foregoing, we are of the opinion that:

(1) The Authority is a joint powers authority duly organized and validly existing under the JPA Agreement and the laws of the State of California;

(2) The Authorizing Resolution was duly adopted by a majority of the Governing Board of the Authority at a meeting which was called and held pursuant to law and with all public notice required by law and at which a quorum was present and acting throughout, and the Authorizing Resolution is now in full force and effect and has not been modified, rescinded or amended;

(3) To the best of our knowledge after reasonable investigation, there is no action, suit, proceeding or investigation, at law or in equity, before or by any court, public board or body pending or threatened in writing against the Authority which would materially and adversely impact the Authority’s financial condition, (b) ability to deliver the Certificates and perform its obligations under the Certificates, the Trust Agreement, the Escrow Agreement, the Lease Agreement, the Site Lease, or the Purchase Agreement, and (c) ability to complete the transactions described in and contemplated by the Certificates, the Trust Agreement, the Escrow Agreement, the Lease Agreement, the Site Lease, the Purchase Agreement, or the Continuing Disclosure Certificate or in any way contesting the validity of the Certificates, the Trust Agreement, the Escrow Agreement, the Lease Agreement, the Site Lease, or the Purchase Agreement or which would have a material adverse effect on the security for the Certificates.
This opinion letter is rendered solely for the benefit of the addressees in connection with the subject transaction and may not be relied upon or used, or its benefit claimed, by any other person or entity, or for any other purpose, without our prior written consent, except that copies may be included in any closing document transcript relating to the Certificates. We undertake no duty to notify any person or entity of changes in facts or circumstances upon which this opinion is based or any new facts or information which may become known to us after the date of this opinion. We bring to your attention the fact that our legal opinions are an expression of professional judgment and are not a guarantee of a result.

Sincerely,

Michelle Marchetta Kenyon
City Attorney
EXHIBIT C

FORM OF OPINION OF CITY ATTORNEY

[Closing Date]

U.S. Bancorp Investments, Inc.
One California Street, Suite 350
San Francisco, California 94111

Re: City of Pacifica 2016 Refunding Certificates of Participation (2008 Certificates Refunding)

Ladies and Gentlemen:

I am the City Attorney of the City of Pacific (the “City”) and have acted as such in connection with the issuance of the above-referenced Bonds (the “Certificates”). This opinion letter is rendered in satisfaction of the requirements of Section 7(e)(vii) of the Certificate Purchase Agreement dated September __, 2016 (the “Purchase Agreement”), by and among U.S. Bancorp Investments, Inc., the City of Pacifica Financing Authority (the “Authority”), and the City, providing for the purchase of the Certificates. The Certificates are being issued pursuant to a Trust Agreement (the “Trust Agreement”) dated as of October 1, 2016 among the Authority, the City, and U.S. Bancorp Investments, Inc., as trustee.

In rendering the opinions set forth herein, we have examined and relied upon originals or copies of the following:

(i) Resolution No. _______, adopted by the City Council of the City on September 12, 2016 (the “Authorizing Resolution”);

(ii) The Trust Agreement;

(iii) The Amended and Restated Lease Agreement dated as of October 1, 2016 (the “Lease Agreement”), by and between the City and the Authority;

(iv) The Amended and Restated Site Lease, dated as of October 1, 2016 (the “Site Lease”);

(v) The Purchase Agreement;

(vi) The Official Statement dated September __, 2016, relating to the Certificates (the “Official Statement”);

(vii) The Escrow Agreement dated October 1, 2016 (the “Escrow Agreement”) between the City and U.S. Bancorp Investments, Inc., as escrow agent; and

For the purposes of this opinion letter, except as necessary to render the opinions set forth herein, we have not undertaken examination of any public records or other documents not specifically referred to above. We have assumed that (1) all documents submitted to us as copies conform to the original documents, and the originals of such copies are authentic, and (2) all of the above-referenced documents are accurate and complete.

Our opinions set forth herein do not extend to, and we express no opinions herein with respect to, any laws other than the laws of the State of California, but exclusive of the tax and securities laws, rules and regulations of the State of California and the laws of the State of California relating to debt limitations and restrictions applicable to public entities.

Whenever a statement herein is qualified by “to the best of our knowledge” or similar phrase, it is intended to indicate that, during the course of our representation of the City in connection with the transactions described herein, no information that would give us current actual knowledge of the inaccuracy of such statement has come to our attention. However, unless otherwise noted herein, we have not undertaken any independent investigation to determine the accuracy of such statement, and any documents and matters described in this opinion and in the preparation of this opinion letter should not be regarded as such an investigation. Furthermore, no inference as to our knowledge of any matters bearing on the accuracy of any such statement should be drawn from the fact of our continued representation of the City, either past or present.

Our opinions expressed herein may be affected by actions taken or events occurring after the date hereof. As to questions of fact material to our opinions, we have relied upon representations by the principal officers of the City.

On the basis of, and subject to and in reliance upon, the foregoing, we are of the opinion that:

(1) The City is a general law city and a municipal corporation duly organized and validly existing under the laws of the State of California;

(2) The Authorizing Resolution was duly adopted by a majority of the City Council of the City at a meeting which was called and held pursuant to law and with all public notice required by law and at which a quorum was present and acting throughout, and the Authorizing Resolution is now in full force and effect and has not been modified, rescinded or amended;

(3) To the best of our knowledge after reasonable investigation, there is no action, suit, proceeding or investigation, at law or in equity, before or by any court, public board or body pending or threatened in writing against the City which would materially and adversely impact the City’s (a) financial condition, (b) ability to deliver the Certificates and perform its obligations under the Certificates, the Trust Agreement, the Escrow Agreement, the Lease Agreement, the Site Lease, the Purchase Agreement, or the Continuing Disclosure Certificate, and (c) ability to complete the transactions described in and contemplated by the Certificates, the Trust Agreement, the Escrow Agreement, the Lease Agreement, the Site Lease, the Purchase Agreement, or the Continuing Disclosure Certificate or in any way contesting the validity of the Certificates, the Trust Agreement, the Escrow Agreement, the Lease Agreement, the Site Lease, the Purchase Agreement, or the Continuing Disclosure Certificate or which would have a material adverse effect on the security for the Certificates.
This opinion letter is rendered solely for the benefit of the addressees in connection with the subject transaction and may not be relied upon or used, or its benefit claimed, by any other person or entity, or for any other purpose, without our prior written consent, except that copies may be included in any closing document transcript relating to the Certificates. We undertake no duty to notify any person or entity of changes in facts or circumstances upon which this opinion is based or any new facts or information which may become known to us after the date of this opinion. We bring to your attention the fact that our legal opinions are an expression of professional judgment and are not a guarantee of a result.

Sincerely,

Michelle Marchetta Kenyon
City Attorney
SUBJECT:
Developer Selection and Authorization to Prepare and Agreement to Negotiate Exclusively for Development at 2212 Beach Boulevard

RECOMMENDED ACTION:
Move to approve the selection of recommended development team, James H. Friend of Friend Development Group LLC, based on the proposed hotel and restaurant concept submitted for 2212 Beach Blvd.; and authorize the City Manager to prepare an Agreement to Negotiate Exclusively (ANE) with the selected developer for subsequent City Council review and approval, and take all necessary steps to do so.

STAFF CONTACT:
Anne Stedler, Economic Development Manager
stedlera@ci.pacifica.ca.us
650-738-7402

BACKGROUND/DISCUSSION:
The transformation of the City’s former waste water treatment plant site into a modern development that could contribute to the City’s economic base has been envisioned since the late 1990s. Over the years, a number of efforts have been attempted but not completed.

The most recent effort that culminates in tonight’s recommended action began in 2010. More information follows below.

City Council Launches Planning for Site Development in 2010
During the period from 2010 through early 2013, the City of Pacifica engaged in comprehensive, multi-disciplinary development planning for the site at 2212 Beach Boulevard. This approximately 3.5 acre site was available for re-use after the closure of the former City Waste Water Treatment Plant in 2000. The property offers 350 feet of ocean frontage and is one of the very few coastal development sites close to San Francisco and the Peninsula, and is considered one of the best hotel sites available anywhere on the California coast. Surrounded by visitor amenities such as the Golden Gate National Recreation site at Mori Point, the Sharp Park Golf Course, the Pacifica Pier, and the seven-plus mile Coastal Trail that connects to the Devil’s Slide Trail south of Pacifica, the property at 2212 Beach Boulevard is a rare site ideally suited to a visitor-serving hotel.

During the 2010 - 2013 planning phase, the city, community members, and a consultant team
worked together in a joint effort that identified key project goals:

- Anchor the Palmetto ‘Main Street’ project
- Strengthen Pacifica’s economy
- Increase tax revenues-transient occupancy tax in particular

The technical planning was extensive. Multiple approvals by the City Council authorized technical studies, concept planning for new uses on the site, and certification of an environmental impact report (2013 EIR) in connection with amendments to the City’s General Plan and zoning.

The planning work was done during the Great Recession, a time when financing was largely unavailable for new real estate projects and hotel development was non-existent. The concept plan proposed a hotel, a new library and housing. One City report acknowledged the troubled economy, recognizing that, “this is the time to plan, so we can move forward when the market is strong again.”

California Coastal Commission Staff State Preference for Hotel in 2014

In a November 2014 letter, the California Coastal Commission stated its preference for visitor serving uses such as a hotel as their top priority and the library as a second priority. Residential development was identified as being the Commission staff’s least preferred land use because it doesn’t contribute to public access to the coastline nor serve visitors. Given this preference, City staff focused on simplifying the project to align with the Commission’s preferences in order to streamline the project consideration process when it comes before the Commission for approvals and permits.

City Goals and Strong Hotel Market Align in 2015

In 2015 the City Council developed a set of goals and adopted a work plan that evaluated the many overarching issues facing the City as a whole. The Council assigned top priority to “economic development” as the best way to achieve fiscal sustainability. Consistent with that, the Council identified development of 2212 Beach Boulevard and completing the Palmetto Streetscape as its second priority among a list of 20 projects and initiatives.

As staff worked to move the Council’s priorities forward, discussions with hotel industry professionals produced information that the hotel market was strong and our timing to solicit proposals for the site was optimal. The hotel market appeared to be aligned with the goals for the 2212 Beach Boulevard site and the Council priority for economic development for the first time.

Council Approves Developer Selection Criteria for Hotel in October 2015

On October 26, 2015, City Council approved a two-step selection process to seek qualified development teams for the site: first, a Request for Qualifications (RFQ) was distributed widely.
to prospective developers and, later, a Request for Proposals (RFP) would be addressed to finalists. At that time, staff recommended the effort focus on the hotel and library as the primary uses for the site because of the site’s relatively small size (3.5 acres) and to ease and shorten the expected approval process through the City and the Coastal Commission. Given the City’s motivation for fiscal sustainability, the primary objectives became the hotel and library as anchors for Palmetto Avenue (as the City’s new “Main Street”) and generating the associated tax revenues from hotel operations.

This action also approved developer selection criteria, which are provided for reference as Attachment A of this staff report. The criteria focused heavily on the experience of the developer that demonstrated capacity to finance, plan, entitle, build and operate a hotel, including restaurant and related amenities, and experience in business districts, coastal areas, local government, and Business Improvement Districts. These criteria are the basis on which the developer selection is recommended, as presented later in this report.

**Developer Response Affirms Beach Boulevard Site for Hotel Development in 2016**

Six development teams submitted qualifications for City consideration in January 2016. The qualifications were presented to the City Council at its meeting on March 28, 2016 along with an update on the findings of the developer selection process that included a summary of the hotel market. The summary report is repeated here for ease of reference.

The number and quality of RFQ responses confirmed that Pacifica can gain from the current strong market cycle. Despite the fact that Pacifica has long been considered a tertiary market at best, and rarely recognized for its proximity to San Francisco or SFO, it obviously attracted six competitive hotel developers/operators. This presented a never-before opportunity to strengthen Pacifica’s hospitality sector. The submitted visions and proposals showed how much possibility they saw in the site, the coastline setting, and easy proximity to San Francisco and SFO.

Hotel developers considering the RFQ repeatedly said Pacifica’s hotels are performing well in this market, and the market for additional hotel rooms, particularly for new product and a broader range of choices is highly attractive. The City’s hotel consultant (retained to assist in the selection process) who studies the Pacifica market and the larger Bay Area market stated the following:

- The additional variety of accommodations and price points at the proposed new hotel would strengthen Pacifica as a hotel market, and solidify its place in the San Francisco area hotel market.
- Pacifica’s geographic proximity to San Francisco, SFO, the San Francisco Peninsula and to BART will become better known among business travelers and will help fill hotel rooms and restaurants more easily during the weekdays.
- The hotels suggested by the competing developers represent brands and or market
segments not currently in Pacifica. Each proposed hotel would bring in loyal customers via their central reservation systems or by target marketing. In effect, this will increase Pacifica’s visibility as a travel destination overall.

Additional Recent Council Direction Related to 2212 Beach Boulevard

As the 2212 Beach Boulevard Developer selection process has been underway, the City Council has also taken action on the following important related matters:

- **New Pacifica Library**
  Related to the development of Beach Boulevard is the realization of the community’s vision for a new Pacifica Library that will occupy a portion of the site, and also is listed in the City Council's Work Plan as a high priority (#9). At its meeting of July 11, 2016, the Council acted to place a measure on the November ballot to obtain voter approval for the sale of general obligation bonds to pay for the proposed library. Additionally, the Council authorized staff to hire Group 4 as the project architect and to undertake the Schematic Design Phase. (Schematic is the first phase of building design, addressing what is included in the building, how the parts of the building relate to one another, the overall shape and placement of the building, etc.).

- **Coastal Hazards Report**
  The 2013 Environmental Impact Report (EIR) had assessed coastal hazards and identified the site as buildable. With recent increased concerns about sea level rise, staff engaged Moffat and Nichol, Inc., to develop an updated study for the 2212 Beach Boulevard site that was presented at the City Council meeting of July 11, 2016. The study evaluates the risk of coastal hazards through 2100 including wave overtopping, sea level rise and tsunami. This additional study addresses sea level rise data that has been released as part of regional studies since the 2013 EIR, and analyzes that data with regard to development of this site; a copy of the study is included as Attachment B.

  The Moffat and Nichol report concluded that the site is buildable, with the only risk of significant flooding being a very rare, worst case tsunami as calculated for extreme emergency purposes by the State. This report addressed the entire City property at 2212 Beach Boulevard, which is proposed site for both the hotel and new library. A representative of Moffat and Nichol will be present at tonight’s meeting to review the report and to address any questions the Council or public may have.

- **Palmetto Streetscape**
  On August 8, 2016 City Council approved design recommendations for the Palmetto Avenue Streetscape Project - Phase I with the expectation that it will be advertised for bids in October 2016 with a construction start date of first quarter 2017.

**ACTIONS BEFORE THE CITY COUNCIL TONIGHT**

There are two related actions presented to the City Council tonight: (1) Select a developer; and
(2) direct staff to move forward with preparing an agreement to negotiate exclusively with that developer. To support these decisions, staff has conducted an extensive process to solicit development proposals and evaluate them with the assistance of professional experts from a variety of fields.

**Action 1: Select a Developer to engage in more indepth determination of a hotel project**

The hotel proposals and development teams were evaluated based on all the selection criteria approved by the City Council and the capacity to achieve the City’s stated goals for the site (see Attachment B). The criteria emphasized demonstrated experience in securing permits, financing (predevelopment, construction and permanent project phases), and operating a hotel. Experience is a strong indicator of the ability to carry out public review for Planning Commission, City Council and Coastal Commission approvals, construct a complex site, and ultimately a completed and operating hotel.

Six teams responded to the RFO; all were invited to submit proposals; four continued their interest and submitted proposals. They represented a range of experience in development, hotel operation with branded and independent boutique hotels, and working relationships in the hotel industry. Two of the respondents had won awards within the last six months recognizing their work and several had strong industry recognition. Two of the four finalists pursued combined hotel and condominium projects and two presented stand-alone hotel proposals. Summaries of their proposal are shown below:

- **A F Canta** - a 123-room independent boutique hotel coupled with 62 condominiums, with a restaurant, retail space and a spa/fitness facility. Underground parking.

- **Friend Development Group LLC** - A 120-room, select service hotel under the Hilton family of brands with surface parking that tucks under the hotel building; restaurant, snack shop and meeting room supported by extensive outdoor deck space and rooftop bar along Beach Boulevard.

- **The Peebles Corporation** - A select service 116-room hotel under the Starwood family of brands with underground parking adjacent to 51 condominiums with above grade structured parking. A restaurant is one of several amenities including space for an arts center.

- **StonePark Capital** - A 109-room branded select service hotel divided into three buildings to maintain the neighborhood scale. An above-ground parking garage interior to the site that provides parking for all site uses (with City paying for library spaces) A cafe off the lobby at the southwest corner of the property, and retail space fronts Palmetto south of the proposed library.

A team of consultants assisted staff in assessing the proposals in relation to the selection criteria, real estate and hotel industry factors, design issues and coastal hazards. The team
reviewed the business terms, design proposals (now posted on the City website at <www.cityofpacifica.org/BeachHotel>), and conducted two sets of interviews with proponents.

The team of staff and consultants analyzed the proposals and the capacity of each development team to meet the City goals, and to complete and operate the hotel. The team also took into consideration the Coastal Commission staff’s preferences in relation to the type of land use being proposed by the various development teams.

- **Recommendation for Developer Selection**

Based on the full analysis and all information available, the developer judged to be best able to meet the City goals is **Friend Development Group LLC**, owned by James H. Friend. Staff’s recommendation is based on the expert opinions of professionals in the finance, real estate, hotel and urban design fields and is summarized by Mr. Tim Kelly of Keyser Marston Associates in a memo included as Attachment C. Mr. Kelly is present to address the City Council and respond to questions as needed.

Mr. Friend’s interest in this site is based on his longstanding association with the Peninsula, having grown up and attended school here, and he remains in close touch with family members who still reside in the immediate area. After a brief two year stint as a practicing lawyer, Mr. Friend launched his career in the real estate industry initially as a Project Manager at Stanford University and later moved into real estate sales and financing. Mr. Friend founded Friend Development Group in 1985 and has spent most of his career in the New York area.

Mr. Friend is known for his willingness to tackle difficult projects, his ability to resolve technical challenges, and his record of building hotels that are memorable because they recognize local character and history, and reflect the community in which they are located. For example, the hotel Friend built near Hyde Park, New York, features photographs from the Roosevelt Library at Hyde Park. His hotels are also known for designs that exceed the standard corporate requirements and are unique to individual properties.

More information on Mr. Friend’s track record in the hotel industry is included in the Keyser Marston Associates report attached to this report, and the Qualifications and Proposal submittals on the City web site.

Each of the proposals met the City’s goals in some ways but only one offered a comprehensive package that was strong across the board. The Friend Development Group LLC’s proposal was deemed most responsive for a variety of reasons including the following:

- **Strong team track record.** The proposed group has worked together to deliver at least four successful hotels in metropolitan areas similar to Pacifica.

- **Distinguished select service hotel designs.** Their previous hotel designs offer a special experience to visitors that reflect the community and are not “cookie cutter”.

- **Strong financial relationships with lending institutions and investors needed to bring a plan to fruition.”**
Friend is only one of two respondents able to make a stand-alone hotel work financially; the two respondents that included residential development as part of their proposals were asked to submit a hotel-only project but declined.

Experience with and support for business improvement districts (BIDs); in fact, Mr. Friend currently serves on the board of directors for a BID.

A site design that locates hotel rooms along the southern edge of the property and dedicates the ocean front property edge to public serving, visitor uses such as a stand-alone restaurant on the corner of Montecito Avenue and Beach Boulevard, meeting room space, rooftop bar, an interesting combination of indoor/outdoor uses that create a destination not just for the hotel patrons but equally so for the general public including Pacifica residents.

Mr. Friend has a reputation for being able to take on challenging projects and persist with seeing them through to completion, a very important quality for this project.

In sum, Friend Development Group LLC proposed the strongest, most complete and best overall package in response to the City’s solicitation.

**Action 2: Authorize the City Manager to Prepare an Agreement to Negotiate Exclusively (ANE) with the Selected Developer**

This recommendation launches the next phase in the multi-year process leading to a hotel on the 2212 Beach Boulevard site. The purpose of the Agreement to Negotiate Exclusively (ANE) is to provide the developer assurances that the City will work exclusively with it, while the developer funds the cost of refining the design of the hotel and the studies associated with the environmental review (CEQA) of the project necessary to obtain the land use approvals (from the Planning Commission, City Council and Coastal Commission) for the project. The term of the ANE is expected to last approximately eighteen months. During this time period the developer will engage the community as the design of the hotel is refined. This current proposal reflects the developer’s preliminary conceptual vision; it is not necessarily the final design.

The ANE itself does not commit the City to selling or the developer to buying the property. It is a contract whereby the City and Developer agree to negotiate in *good faith* during the term of the ANE to prepare a Disposition and Development Agreement (DDA) for future consideration by the City Council. The DDA would be presented to the City Council for its consideration at the same time the necessary land use entitlements for the proposed hotel project are presented to the City Council. Thus, if the necessary land use approvals are granted and the DDA is approved, the DDA would provide for the conveyance of fee title to the site to the Developer and the development of the site by the Developer with the hotel project as approved by the City. However, as the ANE will provide, the City Council will continue to retain its discretion whether to approve the necessary land use entitlements for the proposed hotel project and the terms of a proposed DDA, and failure to approve such matters will not constitute a default or breach of the terms of the ANE.
At the same time the design work is underway, the selected developer and City staff will be evaluating the business terms necessary to achieve the project and which would be included in the DDA. This includes the development schedule and the date and terms of the sale of the property. These terms cannot be determined at this time when many aspects of the project are still unknown and subject to future entitlements. City staff will negotiate with the selected developer the terms to be included in the DDA, based on direction from the City Council. The final design, project plans, schedule and business terms will be the result of these processes.

At the end of a successful ANE period, the City Council would be asked to consider and approve a DDA that is a binding obligation between the City and the Developer to sell the land and build the hotel as approved through the City’s planning process.

In summary, this recommended action before the Council is to authorize the City Manager to negotiate an ANE with a selected developer. The ANE, which will be brought back for Council consideration at a future meeting, will provide for the developer to apply for and pay all expenses related to the land use entitlements and environmental review needed for the proposed hotel project, while the City and Developer engage in exclusive, good faith negotiations regarding the terms of a DDA for the sale and development of the property with a hotel.

CONCLUSION

The developer selection process illustrates (through the proposals received and staff and consultant analysis) that the long-established goals for development of the property at 2212 Beach Boulevard can be achieved to do the following:

- Anchor Palmetto Avenue ‘Main Street’
- Strengthen Pacifica’s hotel sector
- Increase Transient Occupancy Tax revenues

The City has been fortunate to receive proposals from four high-quality development teams and appreciates the work and expense that each has expended to participate in the RFQ and RFP processes. Staff is very pleased to present the results of the process and to recommend a very solid development team with whom to begin negotiations toward the property transfer and ultimately a new hotel and related amenities.

The recommendation of Friend Development Group LLC is based on the expert opinions of professionals in the finance, real estate, hotel and urban design fields as summarized by Tim Kelly of Keyser Marston (see Attachment C) and with which staff agrees. While all proposals offered elements that were of interest to the City, Friend offered the best combination of elements to achieve the City’s vision for the site.

With Council direction tonight, staff will move forward with the next step of this process, preparing an ENA, as quickly as possible.
**FISCAL IMPACT:**

There will be costs associated with staff time involved in preparing the ENA and continuing the negotiation process that are difficult to quantify but important to note. In addition, the fiscal impact of the property transfer is difficult to estimate until the terms are negotiated.

The potential tax revenue expected from a hotel on the site is conservatively estimated at $700,000 - $900,000 annually.

**ORIGINATED BY:**

City Manager’s Office

**ATTACHMENT LIST:**

Attachment A: Developer Selection Criteria, Excerpt from City Council Staff Report October 26, 2015 (PDF)
Attachment B: Executive Summary and Technical Report, Moffat & Nichol (PDF)
Attachment C: Beach Boulevard Site: Developer Selection, Keyster Marston (PDF)
ATTACHMENT A

Developer Selection Criteria
Excerpt from City Council Staff Report, October 26, 2015

Developers will be evaluated at the RFQ phase based on criteria that include:

- Financial history and financial relationships for past hotel developments (equity and debt)
- History of relationships with hotel designers, architects and operators, and with restaurants and services or retailers that are potential hotel tenants
- Prior experience and demonstrated capacity to develop and manage a hotel with proximity to a "main street" and/or a coastline
- Prior experience developing and operating a hotel through a development agreement with the local government, including delivery of required public benefits such as coordination with the library development and operations
- Prior experience and demonstrated capacity to develop and manage a hotel that functions as a destination, including:
  - High quality design (architecture, finishes and fixtures)
  - Hotels that function as an anchor and provide synergy to attract or support visitor serving uses (restaurant, retail and activities) to nearby sites on Palmetto Avenue
  - History of long-term ownership and re-positioning or tenanting over time to maintain the desirability of the property and customer loyalty
  - History of building and maintaining project working relationships, and participating in local community relationships and efforts
  - Demonstrated knowledge and expertise in securing permits
- Statement of vision for the site that describes the type and character and extent of the hotel development envisioned, its ambience, and how it would create a unique and special place

At the RFP stage, the criteria for evaluating the hotel proposals will include:

- Evidence that the development proposal is for a destination hotel that builds on and complements existing visitor features and amenities (the oceanfront, Pier, coast trail, golf course and Mori Point) and the future library and Palmetto Avenue "Main Street"
- Factual information demonstrating that the number of hotel rooms, the development layout and design, and the on-site amenities create an ambience that transforms the site into a hotel destination of choice in and of itself
- Evidence that the size of the hotel operation and amenities can be financially successful for the long term
- Identification of the anchor restaurant tenant and any other visitor serving amenities that help sustain the interest of the destination visitor, and anchor the Palmetto "Main Street"
- Quality of design, furniture, fixtures and finishes to support a destination hotel
- How the hotel will relate to the other uses on the site
- Price of land and the timing of the land payment
- Proposed development schedule and the likelihood to achieve it.
- At the RFP evaluation, first priority will be given to offers with a date specific commitment to construct consistent with the approved plans and the developer who has direct experience with comparable hotel developments.
- Second priority will be given to offers with a date specific commitment to construct consistent with approved plans.

Note: The italicized priorities are intended to reduce the market risk of delay and gain commitment to start construction.
Coastal Hazards Study
2212 Beach Boulevard, Pacifica

TECHNICAL REPORT WITH EXECUTIVE SUMMARY

Prepared for:
City of Pacifica
170 Santa Maria Ave
Pacifica, CA 94044

Prepared by:
moffatt & nichol
2185 N. California Blvd.
Walnut Creek, CA 94596

June 2016
M&N Project No: 9246
Executive Summary

Introduction

The City of Pacifica owns a 3½ acre property located at 2212 Beach Boulevard and is taking steps for redevelopment to include a public library and visitor-serving uses such as a hotel, restaurant and retail space. The oceanfront site is located in one of Pacifica’s oldest neighborhoods and provides unique opportunities for public access to the coast.

The City completed a variety of planning processes and environmental review by 2013. Since then, there has been increasing focus on regional studies that document known risks that affect the City of Pacifica such as bluff erosion and sea level rise. These regional studies recognize the need for local government to evaluate specific locations and determine short, medium and long term risk. These local studies will provide decision-makers with an understanding of the hazards and a basis for developing solutions.

In response the City commissioned this additional study of potential coastal hazards for 2212 Beach Boulevard including tides, waves, and sea level rise; tsunamis; and bluff erosion. A summary of the conclusions is provided in this Executive Summary. A detailed description of the analysis can be found in the following Coastal Hazards Study Technical Report for 2212 Beach Boulevard.

Coastal Hazards

Present-day coastal hazards found to affect the project site are limited, and related to flooding caused by wave overtopping during high tides and the very rare occurrence of a significant tsunami event.

Flooding from Tides, Waves and Sea Level Rise

Water levels during high tides do not pose a flood hazard in themselves. Current water levels during high tide are on the order of +7.4 feet (with respect to NAVD88 datum), while the 1% annual flood event would raise the sea level to +8.7 feet NAVD88. These values combined with sea level rise projected for both mid-century and end-of-century are well below the crest of the seawall (+26 feet NAVD88) that fronts the 2212 Beach Boulevard property.

With respect to waves, given the presence of the beach and seawall, present day hazards are limited to the combination of high wave conditions and high tides, which result in elevated water levels and increase the potential of wave overtopping. Present day wave overtopping typically causes limited ponding on the street and promenade immediately behind the seawall. Wave overtopping would not directly affect the 2212 Beach Boulevard property.

With mid-century (2050) and end-of-century (2100) projections for sea level rise, currently estimated to range from 5 to 24 inches by 2050 and 17 to 66 inches by 2100, wave overtopping...
of the seawall will increase correspondingly. Given that the beach and the seawall will continue to be maintained, it is estimated that water from wave overtopping would be generally limited to a distance of approximately 40 feet from the seawall, and at its maximum, reaching only the road adjacent to it. (The site at 2212 Beach Boulevard is separated from the seawall by a landscape area, as well as the promenade and Beach Boulevard.) When the beach narrows, as may occur after a significant storm, wave overtopping could lead to temporary ponding in the road area and parking area fronting the Beach Boulevard property. This is shown in Figures 1 and 2.

Tsunami
Temporary inundation from rare tsunamis represents a potential hazard for the Beach Boulevard property and surrounding areas of the City. A tsunami event with a 0.4% annual chance of occurrence (one that occurs on average once every 250 years) such as the USGS SAFRR scenario could result in short term inundation of a few inches (less than 1 foot of ponding) for existing conditions, as shown in Figure 3. A very large and even more infrequent event, such as the CalEMA scenario (0.1% annual chance of occurrence, which occurs on average once every 750 to 1000 years) would result in more inundation, as shown in the CalEMA maps. This is also shown in Figure 3. Such a large tsunami has a low probability of happening because many causal factors have to occur simultaneously, such as:

- A very large earthquake would have to occur (of a magnitude greater than the 1906 San Francisco Earthquake).
- The earthquake would have to occur precisely at a location that would impact Pacifica significantly. This means the earthquake would have to be in the subduction zone of Alaska or along the Aleutian Islands. (Tsunamis from the South Pacific tend to dissipate by the time they reach Pacifica).
- The earthquake would have to result in a very large rupture of the earth’s crust, with a significant deformation of the ocean floor.

Bluff Erosion
Bluff erosion (also referred to as bluff retreat\(^4\)) is not estimated to be a direct hazard to development of 2212 Beach Boulevard, as the existing seawall prevents erosion and encroachment into the project site. This report assumes that the seawall and other protection in place are properly maintained.

Conclusion
The presence of the beach and seawall, and continued maintenance of these elements, limits exposure to flooding from tides, waves and sea level rise, and to bluff erosion. However, based on the analysis summarized above, rare and infrequent tsunamis are the one hazard that could potentially result in inundation along the City’s coastline, including the site at 2212 Beach Boulevard. The buildings’ design can take these risks into account and engineering solutions can be applied to address them.

\(^4\) Bluff retreat is what is observed, while erosion is the process causing the retreat.
Figure 1 - Limits of overtopping hazard accounting for the projected 2100 sea level rise.
Figure 2 - Elevation view of wave overtopping hazards associated with sea level rise.
Figure 3 - Elevation view of tsunami hazards.
Coastal Hazards Study
2212 Beach Boulevard, Pacifica

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June 2016
M&N Project No: 9246
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1. INTRODUCTION

1.1 Background

The City of Pacifica owns a 3½ acre property located at 2212 Beach Boulevard and is taking steps for redevelopment to include a public library and visitor-serving uses such as a hotel, restaurant and retail space. The oceanfront site is located in one of Pacifica’s oldest neighborhoods and provides unique opportunities for public access to the coast.

The site was formerly used for the Sharp Park Waste Water Treatment Plant (SPWWTP). The SPWWTP was demolished in 2000 after the completion of the Calera Creek Water Recycling Plant replaced it as the area’s water treatment plant. Currently, the site contains the Council Chambers Building, a Thickening Building, Pump Station, and a small garage. Only the pump station is expected to remain during the redevelopment.

The City completed a variety of planning processes thru 2013. In recent years, studies done at the regional level suggest that the coast in the City of Pacifica is exposed to coastal hazards such as progressive bluff erosion and sea level rise which may put infrastructure and improvements at risk. These regional studies recognize that local government can undertake further studies of specific locations. For this reason, there is a need for local feasibility studies that evaluate present conditions and determine short, medium and long term risk. These local studies will provide decision-makers with an understanding of the hazards and a basis for developing solutions.

In response the City commissioned this additional study of potential coast hazards for 2212 Beach Boulevard. This 2212 Beach Boulevard Technical Report evaluates the project site’s exposure to coastal hazards including tides, waves, and sea level rise; tsunamis, and bluff erosion.

1.2 Purpose

The purpose of the study is to assess the site’s exposure to the coastal hazards listed below:

- Tides
- Coastal Flooding
- Waves
- Tsunamis
- Bluff Retreat
- Sea Level Rise

This study identifies risks associated with these conditions and provides potential developers with an understanding of the potential coastal hazards and a basis for development of solutions to address these risks.

1.3 Scope of Work

This study examines relevant data including existing topographic information, water level and wave conditions, and tsunami inundation information. Additionally, this study applies this information to develop flood hazard maps. These maps show areas of the site that are subject to coastal flooding from high tides, storms, tsunamis, and future sea level rise.

Data sources for each coastal hazard listed above as well as the agencies providing regulatory guidelines are provided in Table 1.
Table 1: Coastal Hazards and Data Sources

<table>
<thead>
<tr>
<th>Coastal Hazards</th>
<th>Agency</th>
<th>Data Sources</th>
<th>Data available at…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tides</td>
<td>National Oceanic and Atmospheric Administration (NOAA)</td>
<td>National Oceanic and Atmospheric Administration (NOAA)</td>
<td><a href="http://www.tidesandcurrents.noaa.gov">www.tidesandcurrents.noaa.gov</a></td>
</tr>
<tr>
<td>Coastal Flooding</td>
<td>Federal Emergency Management Agency (FEMA)</td>
<td>FEMA Flood Insurance Rate Maps (FIRMs)</td>
<td><a href="https://msc.fema.gov/portal">https://msc.fema.gov/portal</a></td>
</tr>
<tr>
<td>Waves</td>
<td>Federal Emergency Management Agency (FEMA)</td>
<td>National Data Buoy Center (NOAA NDBC)</td>
<td><a href="http://www.ndbc.noaa.gov">http://www.ndbc.noaa.gov</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coastal Data Information Program (CDIP)</td>
<td><a href="https://cdip.ucsd.edu/">https://cdip.ucsd.edu/</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>USGS Open File Report 2007-1133</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1 and Figure 2 show the site location map and site boundaries, respectively.
Figure 1: Site Location Map

Figure 2: Site Boundary
2. SITE CHARACTERISTICS

The subsequent sections provide information on geology, ground elevations, tides, waves, tsunamis, bluff retreat, and sea level rise relative to 2212 Beach Boulevard.

2.1 Site Geomorphology

Much of the coastline of San Mateo County is classified as stable or unstable based on the weak sedimentary rock underlying the terrace and loose dune deposits (Lajoie and Mathieson 1998). The coastline near Beach Boulevard is categorized as unstable, consisting of a low cliff of terrace deposits, defined as soft, non-resistant sand and gravel, overlaying weakly indurated rock. The area fronting the study site features a seawall and wide beach. The adjacent segments of coastline include riprap armoring. The winter season total water level (still water level + waves) is approximately +8.9 feet NAVD88.

Pacifica is considered a dissipative beach (Collins 2004) as characterized by the Iribarren number (Battjes, 1974) ranging from 0.3 to 0.6. Dissipative beaches are considered high energy beaches with a wide and flat surf zone (Kamphius 2000). The wave energy, and subsequently the beach profile, are seasonally variable. Winter, as defined by months November through April, experiences an average offshore significant wave height of 6.9 feet, 25% higher than the summer (May through October) offshore significant wave height of 5.3 feet (NOAA/NDBC). Wave periods also vary seasonally, with an average period of 8.2 seconds during winter and 6.8 seconds during summer. The beach in front of the bluff is higher and wider during the summer months and erodes to a lower, narrower profile over the winter.

Net sediment transport along the coast of California is in a predominantly southerly direction, driven by North Pacific swell and northwest wind waves (Hapke et al. 2006). Pacifica is part of the San Francisco littoral cell, which stretches from Fort Point to Point San Pedro. A littoral cell is defined as a reach, or compartment, of the shoreline in which sediment transport is bounded. The shoreline change along the littoral cell is considered erosional, with an average long-term (since 1800s) shoreline change rate of -0.7 ± 0.3 feet per year and an average short-term (since 1970s) shoreline rate change of -1.6 ± 1.3 feet per year (Hapke et al. 2006). The beach in front of Beach Boulevard is seasonally variable, with a beach width ranging between 20 and 170 feet (ESA 2016).

2.2 Ground Elevations

Topographic elevations and bathymetry data in the vicinity of the project site were derived from the 2013 NOAA Coastal California TopoBathy Merge Project (NOAA 2013). The data was collected and analyzed by the NOAA Office for Coastal Management, the CA Coastal Conservancy, CA Ocean Protection Council, and CA Department of Water Resources and is a combination of LiDAR and sonar bathymetry. The vertical and horizontal accuracy is estimated at 4 inches and 40 inches, respectively.

Figure 3 and Figure 4 show the elevations of the site and approximately 350 feet offshore. The beach is backed by a seawall that reaches approximately +26 feet NAVD88 in front of site. The maximum elevation occurs along Beach Blvd at approximately +25 feet NAVD88. The project area ground elevations range between +12 and +25 feet NAVD88. The southern portion of the site is between +20 and +22 feet NAVD88 and the northern portion is approximately +25 feet NAVD88. The center of the site has elevations ranging between +16 and +20 feet NAVD88, while the northeast corner is at the lowest elevation, approximately +15 feet NAVD88 with pockets as low as +13 feet NAVD88.
2.3 Water Levels

Water level measurements from NOAA 9414290 tide gauge at San Francisco were used to evaluate the water levels along the coast. The water levels measured at this station include astronomical tide, storm surge, and El Niño effects but not wave action.

The tidal datums are presented in Table 2, referenced to the North American Vertical Datum of 1988 (NAVD88) and to Mean Lower Low Water (MLLW).

Table 2: Tidal Datums for NOAA Station 9414290

<table>
<thead>
<tr>
<th>Datum</th>
<th>feet NAVD88</th>
<th>feet MLLW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Observed Water Level*</td>
<td>+8.72</td>
<td>+8.66</td>
</tr>
<tr>
<td>Mean Higher High Water</td>
<td>+5.90</td>
<td>+5.84</td>
</tr>
<tr>
<td>Mean High Water</td>
<td>+5.29</td>
<td>+5.23</td>
</tr>
<tr>
<td>Mean Sea Level</td>
<td>+3.18</td>
<td>+3.12</td>
</tr>
<tr>
<td>Mean Low Water</td>
<td>+1.19</td>
<td>+1.13</td>
</tr>
<tr>
<td>Mean Lower Low Water</td>
<td>+0.06</td>
<td>0.00</td>
</tr>
<tr>
<td>NAVD88</td>
<td>0.00</td>
<td>-0.06</td>
</tr>
<tr>
<td>Lowest Observed Water Level**</td>
<td>-2.82</td>
<td>-2.88</td>
</tr>
</tbody>
</table>

*Max: 1/27/1983
**Min: 12/17/1933

Water level data from NOAA Station 9414290 is available from 1898 to the present. Since the water level data has been adjusted to the present tidal epoch (1981-2001) by NOAA, the data must be de-trended back to the epoch of their period to remove effects of sea level rise (SLR). This analysis was conducted on 63 years of data between 1945 and 2007 by Moffatt & Nichol (2008) for the Treasure Island Development Project. Return period water levels were determined by performing an extreme value analysis on this 63 year dataset of water levels using the Method of Annual Maxima. This method applies the best fit probability distribution to the highest annual recordings in the dataset. For this analysis, 63 annual extreme water level events were fit to a Weibull distribution to estimate the 2-, 5-, 10-, 25-, 50-, and 100-year return period water levels. These values are presented in Table 3.

Table 3: Return Period Water Levels

<table>
<thead>
<tr>
<th>Return Period (years)</th>
<th>Water Level (feet NAVD88)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>+7.5</td>
</tr>
<tr>
<td>5</td>
<td>+7.9</td>
</tr>
<tr>
<td>10</td>
<td>+8.1</td>
</tr>
<tr>
<td>25</td>
<td>+8.4</td>
</tr>
<tr>
<td>50</td>
<td>+8.6</td>
</tr>
<tr>
<td>100</td>
<td>+8.8</td>
</tr>
</tbody>
</table>
Figure 3: Site Vicinity Elevation Map

Figure 4: Site Elevations
2.4 Waves

Wave data from offshore NDBC buoy 46237 at the San Francisco Bar and NDBC buoy 46026 San Francisco was obtained online from the NOAA National Data Buoy Center. The 46237 buoy at the San Francisco Bar contains data measurements between July 2007 to present and the 46026 San Francisco buoy contains measurements between January 2007 and present. The data consists of significant wave height, peak wave period, and mean wave direction. In the case of buoy 46026 San Francisco, the data also includes wind speed and wind direction. Wave height roses and frequency tables are presented in Appendix A. The following are some key observations:

- Waves primarily approach from the northwest to west sector.
- Predominant waves (over 85% of the waves) are above 8 seconds in wave period. These wave periods indicate that the wave field is dominated by swell; that is, waves of long period not locally generated by the wind, but by distant storm systems in the Pacific Ocean.

The 46026 San Francisco buoy and the 46237 San Francisco Bar buoy are both located offshore; thus, they do not provide an accurate representation of nearshore conditions. In order to determine the flooding potential due to waves, nearshore waves must be examined. The Coastal Data Information Program (CDIP) took measurements near the end of the pier at Pacifica between August 1980 and December 1982. These measurements were taken in approximately 33 feet of water depth.

An additional source of wave data is the Coastal Storm Modeling System (CoSMoS) program released by the Our Coast Our Future (OCOF) project of the USGS California Coastal and Marine Science Center (PCMSC). For the Pacifica shoreline, maps are created to show the effects of storms and different scenarios of SLR. The maps provide estimated nearshore wave heights along the shoreline for the annual, 20-year, and 100-year return period wave heights. The results of the modeling effort were checked against the CDIP data at the Pacifica Pier for the 100-year wave conditions and appear to be in good agreement with the highest values measured between 1980 and 1982.

For this analysis, a wave height of 11.5 feet was chosen as the 100-year nearshore wave height along the coast at Pacifica. This value produces close estimates to the Total Water Level (TWL) determined in the FEMA Flood Insurance Study (FIS) for the coastline of Pacifica, discussed in the subsequent section.

2.5 Coastal Flooding Potential

FEMA flood maps have the area along the seawall mapped as a Zone X-0.2% or area of moderate flood risk (pink zone in Figure 5). This is not considered a Special Flood Hazard Area (SFHA) and, therefore, does not require the purchase of flood insurance. Additional information from the effective FEMA Flood Insurance Rate Map (FIRM) is summarized in Figure 5. A preliminary FIRM has also been released by FEMA, both the effective and the preliminary FIRMs are provided in Appendix B.
The area west of Beach Blvd. is mapped as a SFHA Zone VE, which refers to an area of high flood risk due to wave action. The Base Flood Elevation (BFE) of this area is +24 feet NAVD88. Based on the preliminary Flood Insurance Study (FIS) published for San Mateo County, the Total Water Level (TWL) for the 1% annual chance flood event is +24.4 feet NAVD88 (FEMA 2014). Immediately inland from Beach Blvd., the area is mapped as a Zone X- 0.2%. This indicates an area outside of the 1% annual chance floodplain but within the 0.2% annual chance (500-year) floodplain. The area behind this Zone is an area of minimal flood hazard (area outside of the 500-year floodplain).

2.6 Tsunamis

Because site specific tsunami studies for the coast of Pacifica have not been conducted, two relevant tsunami studies were reviewed and are summarized in this section. The results of each study and the flooding extents in the study area are provided.

2.6.1 Tsunami Inundation Maps for Emergency Planning

The University of Southern California (USC) Tsunami Research Center conducted a series of numerical model simulations for the development of tsunami inundation maps for emergency planning for the State of California. The project was funded by the National Tsunami Hazard Mitigation Program through the California Emergency Management Agency (Cal EMA). By defining the tsunami inundation area, the maps are intended to aid cities and counties in identifying areas vulnerable to tsunami hazard and in developing adequate emergency and evacuation practices. These maps are estimated to portray tsunami inundation extents for a return period of approximately 1,000 years (M&N 2015).

The maps were created by modeling a suite of distant tsunami sources based on hypothetical, but realistic, seismic events. Local tsunami sources include large submarine landslides and fault
movement. MOST (Method of Splitting Tsunamis), a computational program that presents wave evolution over variable bathymetry and topography was utilized for the inundation extent mapping. The events modeled pertaining to the project site are shown in Table 4.

Table 4: Tsunami Sources Modeled for the San Mateo County Coastline

<table>
<thead>
<tr>
<th>Sources</th>
<th>Magnitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local Sources</strong></td>
<td></td>
</tr>
<tr>
<td>Point Reyes Thrust Fault</td>
<td>-</td>
</tr>
<tr>
<td>Rodgers Creek-Hayward Fault</td>
<td>-</td>
</tr>
<tr>
<td>San Gregorio Fault</td>
<td>-</td>
</tr>
<tr>
<td><strong>Distant Sources</strong></td>
<td></td>
</tr>
<tr>
<td>Cascadia Subduction Zone - full rupture</td>
<td>M9.0</td>
</tr>
<tr>
<td>Central Aleutians Subduction Zone #1</td>
<td>M8.9</td>
</tr>
<tr>
<td>Central Aleutians Subduction Zone #2</td>
<td>M8.9</td>
</tr>
<tr>
<td>Central Aleutians Subduction Zone #3</td>
<td>M9.2</td>
</tr>
<tr>
<td>Chile North Subduction Zone</td>
<td>M9.4</td>
</tr>
<tr>
<td>1960 Chile Earthquake</td>
<td>M9.3</td>
</tr>
<tr>
<td>1964 Alaska Earthquake</td>
<td>M9.2</td>
</tr>
<tr>
<td>Japan Subduction Zone #2</td>
<td>M8.8</td>
</tr>
<tr>
<td>Kuril Islands Subduction Zone #2</td>
<td>M8.8</td>
</tr>
<tr>
<td>Kuril Islands Subduction Zone #3</td>
<td>M8.8</td>
</tr>
<tr>
<td>Kuril Islands Subduction Zone #4</td>
<td>M8.8</td>
</tr>
<tr>
<td>Marianas Subduction Zone</td>
<td>M8.6</td>
</tr>
</tbody>
</table>

The map that is relevant to the site is the map corresponding to San Mateo County, San Francisco South Quadrangle, published on June 15, 2009 (State of California, 2009), shown in Appendix B. Per this map, as shown in Figure 6 on the following page, the project site is entirely within the projected tsunami inundation extent. According to the elevation data, the inundation extent reaches elevations of about +36 feet NAVD88 in the project area.

2.6.2 SAFRR Tsunami Scenario

In 2013, the Science Application for Risk Reduction (SAFRR) tsunami study was conducted in order to numerically model a hypothetical, but plausible, far-field tsunami event for the purpose of mapping inundation along the coast of California for emergency, mitigation, and evacuation purposes. The work was carried out by the United Stated Geological Survey (USGS) in collaboration with NOAA, the California Geological Survey (CGS), and the California Office of Emergency Services (Cal OES). The study was published in 2013 (Ross et al. 2013).

Defined by the USGS Tsunami Source Working Group, the scenario is set in the Semidi subduction sector off the Pacific coast of the Alaska Peninsula, with a moment magnitude (Mw) of 9.1 and a rupture length of 360 km. This geographical setting was selected based on the knowledge that tsunamis originating from this region of Alaska (e.g., 1946 and 1964 events) pose the greatest threat to the California coastline. The tectonic source properties were chosen to resemble those of the 2011 Tohoku tsunami in Japan. The scenario was set to occur on the 50th anniversary of the 1964 Alaskan earthquake at high tide (MHW + 0.66 feet). The approximate return period of this event is estimated at 200-250 years (M&N 2015).
Figure 6: Cal EMA Tsunami Inundation of the Study Area

Figure 7: SAFRR Tsunami Inundation of the Study Area
2.7 Bluff Retreat

The bluff along Beach Boulevard is currently protected by a seawall. If this seawall was either removed or not maintained, bluff retreat would occur. If coastal processes were to continue to erode the bluff, the bluff face would continue to move farther and farther inland since the geology of this area shows that terrace deposits are backed by weak or fragmented sedimentary rock.

Studies have shown multiple causes for bluff retreat along the coastline of Pacifica. Lajoie and Mathieson (1998) concluded that wave action was the primary erosive process along the San Mateo County coast by eroding the base of the bluffs, resulting in an overly steep and unstable slope. Another study performed by Hampton and Dingler (1998) suggested that groundwater-induced seepage failures are primarily responsible for bluff erosion.

Collins and Sitar (2008) performed a study examining coastal erosion of multiple coastal bluffs in Pacifica over five storm (winter) seasons. The study showed that when the maximum total water level was above the toe of the bluff, wave-induced bluff erosion could be expected to occur. Specifically, the threshold value for wave-induced erosion for the maximum daily total water level is +12.5 feet NAVD88, 3.6 feet above the season average. They also found that seepage-induced erosion occurred when the 48-hour precipitation exceeded 1.4 inches, approximately 0.8 inches above the seasonal average.

Recently, the US Geological Service has conducted an assessment of shoreline changes and cliff erosion for coastlines around the U.S. For the analysis, the USGS compares historic shoreline and cliff edge locations, typically derived from aerial photography, to recent shoreline and cliff edge positions determined from LiDAR technologies. For the coastal cliff retreat study for the California coastline, topographic maps (T-sheets) provided from the NOAA National Ocean Service (NOS) with cliff edge positions between 1920 and 1935 were compared to LiDAR obtained in 1998 or 2002. The study divided the California coastline into 15 regions; the 158 mile San Francisco South region pertains to this study area. Approximately 50 miles of this reach consists of coastal cliffs. For this segment, the cliff edge position was determined from NOS T-sheets developed between 1929 and 1932 and LiDAR data collected in 1998. The average retreat for the cliff edge during this time frame is 54 feet ± 36 feet. This results in an annual average retreat rate of 0.7 feet per year with an uncertainty of ± 0.7 feet per year.

In 2014, the Our Coast Our Future (OCOF) project of the USGS California Coastal and Marine Science Center (PCMSC) released the Coastal Storm Modeling System (CoSMoS) for the San Francisco Bay area. The CoSMoS model uses a combination of global, regional, and local models to make detailed predictions of storm-induced coastal flooding, erosion, and cliff failures over large geographic scales (USGS PCMSC). It should be noted that this study effort does not take the seawall into account.

2.8 Coastal Regional Sediment Management Plan: San Francisco Littoral Cell.

A Coastal Regional Sediment Management (CRSMP) plan has been developed for the San Francisco Littoral Cell, which includes Pacifica. The objective of the plan is to evaluate sediment management needs within the littoral cell and promote regional, system-wide solutions to address these. The San Francisco Littoral Cell CRSMP, focuses on the Pacific coastline in San Francisco, Daly City and Pacifica and addresses existing and expected future coastal erosion on coastal stretches where mitigation measures are or will be crucial.

The study analyzes geologic, geomorphic, ecological and economical information along the littoral cell to identify critical areas of erosion. In the City of Pacifica, five study reaches are identified as Critical. The proposed mitigation alternatives are a combination of soft and hard engineering measures and are described in the following:
1. Beach Nourishment: Placement of sand to widen the beach for the length of the study reach. This alternative requires new sand placement every time the beach width is reduced to an established minimum. Backshores at each study reach have different treatments, such as being erodible or holding a particular line at existing armor.

2. Beach Nourishment and Multipurpose Reefs: The sand placement component is treated in the same manner as in alternative 1. An offshore reef that further promotes beach widening and provides shelter against waves is added.

3. Armor: Maintaining and/or addition of new coastal armor (e.g., seawalls, revetments) to hold the line against coastal and bluff retreat.

4. Hybrids with managed realignment: A combination of the measures to accomplish the goal of mitigating coastal erosion. Portions of each reach are treated with different measures such as holding the line at existing armor, placement of sand and allow erosion.

The economic impacts associated with sediment management alternatives as well as the net economic benefits at each study reach were estimated. Additionally, a range of governance structure schemes that could address sediment management in a regional sense and achieve the objectives of the CRSMP are proposed.

The cost-effectiveness of each alternative differs per study reach and so does the projected extension of the Coastal Erosion Hazard Zones. However the study concludes that the high risk to which infrastructure at Pacifica is exposed can be controlled with implementation of sediment management alternatives, but will increase if no action is taken.

Based on these findings, further analysis in the present study assumes that the 2212 Beach Boulevard property is and will be excluded from the projected Coastal Erosion Hazard area if the existing seawall and armoring is maintained to hold the backshore limit at its current position.

2.9 Sea Level Rise

In March 2013, the Sea-Level Rise Task Force of the California Climate Action Team (CO-CAT 2013) released their State of California Sea-Level Rise Guidance Document based on the recently published (June 2012) NRC Sea-Level Rise for the Coasts of California, Oregon, and Washington (NRC 2012). Table 5 summarizes the sea level rise projections, including the low and high range values, for the San Francisco Bay area.

<table>
<thead>
<tr>
<th>Year</th>
<th>Projections</th>
<th>Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>2030</td>
<td>6 ± 2 in</td>
<td>2 to 12 in</td>
</tr>
<tr>
<td>2050</td>
<td>11 ± 4 in</td>
<td>5 to 24 in</td>
</tr>
<tr>
<td>2100</td>
<td>36 ± 10 in</td>
<td>17 to 66 in</td>
</tr>
</tbody>
</table>

Using the maximum of the range for 2030, i.e. 1 foot, the seawall is still of adequate elevation to prevent significant wave overtopping, though some overtopping will be present. With 2 feet of SLR (maximum of 2050) range, significant overtopping of the seawall will occur. In order to determine if this overtopping will result in flooding of the project area, the horizontal limit of splash due to this overtopping was estimated. Also called the limit of overtopping hazard, the value is sensitive to the wind speed experienced during the overtopping event. Figure 8 shows the limit of wave overtopping. For this analysis, the estimated 1% annual chance wind speed of 52 mph was used, as approximated using the wind data available from the NBDC gage 46026 with 20 years of wind data (1996-2016). Applying the maximum SLR for 2100 of 5.5 feet (66
inches), the extent of overtopping hazard with the 1% annual chance wind speed is approximately 40 feet from the seawall. This extent reaches Beach Boulevard but does not directly impact the study site. Figure 9 shows the approximate extent of overtopping hazard in front of the site development area.

![Figure 8: Limits of Overtopping Hazard with SLR](image)

The overtopping hazard does not reach the study area, but there is a potential for runoff and ponding due to overtopping waves. Since the frequency and volume of overtopping will increase with sea level rise, this hazard also increases.

Figure 9 provides a section view of hazard limits discussed in this section.
Figure 9: Inundation Zones for a Transect through the Study Area
3. CONCLUSIONS

This section evaluates potential implications that the coastal hazards described previously could have on the development of 2212 Beach Boulevard in Pacifica.

3.1 High Tides

High tides along the coast of Pacifica are not the primary factors associated with coastal flooding and erosion. Additionally, tidal action does not play a large role in sediment movement along the beach. The seawall along Beach Boulevard has an approximate crest elevation of 25 feet NAVD88, providing adequate freeboard above tide levels. Even with 3 feet of SLR (2100 projected value), the tide levels will not reach elevations high enough to result in flooding due to high tides only.

Present day hazards attributed to tides are primarily due to the elevated water levels on high tides, which increases the potential for wave overtopping. Wave overtopping is addressed in the following section.

Neither present day tides, nor tides combined with the mid-century (2050) and end-of-century sea level rise projections pose a flood hazard in themselves. Projected ocean levels combining high tides and sea level rise are well below the crest of the seawall (Figure 9).

3.2 Waves

Wave action is the dominant driving factor for sediment transport and bluff erosion along the coastline of Pacifica. Riprap is present in front of the seawall to protect against wave attack. Large waves erode the beach profile during the winter months, consequently exposing the seawall to waves. Beach erosion is further increased due to the presence of the riprap fronting the seawall.

Present day hazards attributed to waves are primarily due to high surf conditions combined with elevated water levels on high tides, which increases the potential for wave overtopping. Wave overtopping is already evident along the Pacifica seawall, in particular during the winter season, at times when high surf coincides with King Tides. Because the peak of high tides are limited to a few hours, wave overtopping is consequently limited, but recurring.

Present day flooding associated with wave overtopping is typically limited to ponding and local flooding in limited areas. Wave overtopping would not directly affect the 2212 Beach Boulevard property.

Subject to the mid-century (2050) and end-of-century projections for sea level rise, wave overtopping of the seawall will increase correspondingly. However, it is estimated that wave overtopping would still be generally limited to the roadway along the seawall. At worst, wave overtopping could lead to temporary ponding in the road area and parking fronting the 2212 Beach Boulevard property.

Mitigations could (on a regional scale) include protecting the shoreline, e.g. with beach nourishment or armoring as studied under the Coastal Regional Sediment Management Plan, and/or raising the crest elevation of the seawall. Localized mitigations could include provisions for maintaining drainage, or building up low berms such as landscape features along the property.
3.3 Tsunamis

Based on the inundation maps developed by SAFRR and Cal EMA, a tsunami hazard exists at the project site. Though the approximate depth of inundation was not analyzed in this study, topographic information in the vicinity of the project site shows the extent of inundation reaches as high as +26 feet NAVD88 for the SAFRR study (approx. return period of 200-250 years) and +36 feet NAVD88 for Cal EMA (approx. return period of 1,000 years). For comparison, the elevation of the seawall is around +26 feet NAVD88 while site elevations generally range from +25 to +27 feet NAVD88. This shows that tsunami risk exists but at a very low risk of occurrence.

A review of the SAFRR tsunami inundation maps provides the indication that a tsunami event of this magnitude is around the threshold where the 2212 Beach Boulevard property potentially could be affected or remain unaffected. Per Figure 9, the inundation depth along Montecito Road on the north side of the property would be limited to inches (less than a foot).

It is not clear if the SAFRR study included sufficient detail to incorporate the seawall as a protective element. It is therefore estimated that a tsunami event such as investigated under the SAFRR study, or an event slightly larger, could slightly overtop the seawall. On the contrary, the indication is that a lesser event would not overtop the seawall and the 2212 Beach Boulevard property would, in that case, remain unaffected.

In perspective, the estimated return period of the SAFRR event is 200-250 years.

The typical mitigation would be to incorporate a low, continuous wall around the property, which would work as flood protection in the case of tsunami inundation. If building space below ground level is planned for at the 2212 Beach Boulevard property, the flood potential needs to be carefully considered. Typical mitigations would include incorporating a low floodwall around the property site, preventing any openings of water ingress, and locating access on the eastern portion of the property.

Projections for the Cal EMA tsunami are substantially more onerous. This study was focused on emergency planning and therefore depicts the greatest extent of inundation based on several combined scenarios. In the case of such an event, tsunami flood inundation depths could be on the order of several feet. The approach for mitigation of such an event should follow tsunami guidelines for structural design, and could include breakaway walls on the ground level floor of future buildings on the property. In terms of prevention of loss of human life in such an event, it is estimated that warning times for pre-tsunami flooding would be on the order of several hours, but at least 30 minutes (for an earthquake on the Cascadia Fault, local to the West Coast). Means of egress from building(s) should follow codified guidance, and be coordinated with means of egress (to higher ground) for the Pacifica area. To put this scenario in context, the return period estimated for such an event is around 1,000 years.

Per correspondence with the City of Pacifica, it is understood that the City receives immediate notice from the NOAA Pacific Tsunami Warning Center if there is any indication of potential tsunami hazard. Additionally, the City adheres to the San Mateo County protocol for tsunami watches and warnings and provides residents and business owners within potential inundation areas with multiple forms of notification of the hazard (City of Pacifica correspondence).

3.4 Bluff Retreat

Though the cliffs along the coastline of Pacifica are experiencing significant bluff retreat, the seawall at Beach Boulevard prevents erosion at the project site. Bluff retreat is not estimated to be a direct hazard to development of the 2212 Beach Boulevard property. There is still a wide swath of beach maintained along the coast fronting the 2212 Beach Boulevard property, and
sediment transport along the coast is directed south, so a continued influx of sediment to the beach is expected.

If shoreline recession were to continue to the point where mitigations are necessary, local armoring with rock could be an alternative. This would be supplemental to the rock already in place in front of the seawall. Additionally, the Beach Boulevard property would likely be helped by any regional mitigation efforts.

3.5 Sea Level Rise

Short-term SLR (2030) is not expected to increase the potential for flooding for the area along Beach Boulevard because the seawall is of adequate elevation to prevent significant flooding.

Long-term SLR is expected to increase the frequency of overtopping events if the wall is maintained at its current elevation. This increased hazard is expected to apply to a SLR greater than 1 foot (12 inches), the higher end of the 2050 projections. However, even with 5.5 ft. (66 inches) of SLR, the estimated overtopping hazard limit does not encroach on the eastern boundary of Beach Boulevard. However, if the seawall is not maintained, the bluff could retreat and overtopping into the study area can be expected as early as 2050.

It should be noted that the Coastal Regional Sediment Management Plan does call for shoreline maintenance in this area. The current options include sand placement, an artificial reef, seawall maintenance, armor protection or a combination of these solutions.

Guidance for mitigating sea level rise is provided in the California Coastal Commission Sea Level Rise Policy Guidance. Per the Coastal Act Sections 30006.5 and 30335.5, the guidance is to: 1) Recognize and address sea level rise as necessary in planning and permitting decisions; and 2) use best available science to determine locally relevant sea level rise projections and potential impacts for all Coastal Act planning processes, project design, and permitting reviews.

The best available science to determine sea level rise projections is currently expressed in the NRC (2012) sea level rise projections (summarized in Table 5).

---

1 Note: additional guidance in items 3 through 20 of the CCC Sea Level Rise Policy Guidance
4. REFERENCES


6. Correspondence with City of Pacifica, e-mail from Captain Joe Spanheimer dated 2/17/2016.


8. FEMA 2014. Preliminary Flood Insurance Study for San Mateo County, California. Study Number 06081CV001-2D.


18. NOAA Office for Coastal Management’s Digital Coast Database at https://coast.noaa.gov/dataviewer/index.html?redirect=301ocm&action=advsearch&qType=in&qFld=projectid&qVal=1005#app=b23b&bda3-selectedIndex=1


APPENDIX A
Wave Roses
Wave Height Rose for NDBC Station 46026 San Francisco

Significant Wave Height (Annual)
Station 46026 – San Francisco
Period 17−Jan−2007 to 16−Feb−2016

Direction FROM is shown
Center value indicates calms below 0 feet
Total observations 71977, calms 0
About 8.39% of observations missing

Percentage of Occurrence

A- 1: Wave Height Rose for NDBC Station 46026 San Francisco
A-2: Wave Period Rose for NDBC Station 46026 San Francisco
A-3: Wave Height Rose for NDBC Station 46237 San Francisco Bar

Significant Wave Height (Annual)
Station 46237 – San Francisco Bar

Direction FROM is shown
Center value indicates calms below 0 feet
Total observations 110121, calms 0
About 20.5% of observations missing

Percentage of Occurrence

<table>
<thead>
<tr>
<th>Significant Wave Height, feet</th>
<th>Total</th>
<th>0.13</th>
<th>1.57</th>
<th>12.09</th>
<th>33.32</th>
<th>45.95</th>
<th>6.90</th>
<th>100.00</th>
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<tr>
<td>0 – 5</td>
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<td>10.94</td>
<td>13.02</td>
<td>21.06</td>
<td>3.92</td>
<td>50.21</td>
</tr>
<tr>
<td>5 – 10</td>
<td></td>
<td>0.49</td>
<td>2.41</td>
<td>3.90</td>
<td>2.41</td>
<td>4.22</td>
<td>10.58</td>
<td></td>
</tr>
<tr>
<td>10 – 15</td>
<td></td>
<td>0.72</td>
<td>3.90</td>
<td>2.41</td>
<td>3.90</td>
<td>2.41</td>
<td>6.45</td>
<td></td>
</tr>
<tr>
<td>15 – 20</td>
<td></td>
<td>42.58</td>
<td>45.95</td>
<td>33.32</td>
<td>12.09</td>
<td>1.57</td>
<td>0.13</td>
<td>100.00</td>
</tr>
<tr>
<td>20 – 25</td>
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<td>45.95</td>
<td>33.32</td>
<td>12.09</td>
<td>1.57</td>
<td>0.13</td>
<td>0.49</td>
<td>0.72</td>
</tr>
<tr>
<td>≥ 25</td>
<td></td>
<td>2.93</td>
<td>10.58</td>
<td>6.45</td>
<td>0.72</td>
<td>0.49</td>
<td>0.22</td>
<td>0.13</td>
</tr>
</tbody>
</table>

Total observations 110121, calms 0
About 20.5% of observations missing
Peak Wave Period (Annual)
Station 46237 – San Francisco Bar

Direction FROM is shown
Center value indicates calms below 1 sec
Total observations 110126, calms 0
About 20.5% of observations missing

Percentage of Occurrence

| Peak Wave Period, sec | N   | NNE | NE  | ENE | E   | ESE | SE  | SSE | S   | SSW | SW  | SSW | W   | WNW | NW  | NNW | Total |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
|                       | 0.13| 1.57| 12.09| 33.32| 45.95| 6.89|     |     | 100.00|
| 18.5                  | 0.22| 0.83| 0.60 |     |     |     |     |     | 1.72 |     |
| 15                    | 0.72| 7.12| 9.44 | 4.93|     |     |     |     | 22.27|     |
| 11.5                  | 0.30| 4.34| 17.27|15.38| 0.42|     |     |     | 37.71|     |
| 8                     | 0.12| 0.31| 5.58 |20.71| 2.93|     |     |     | 29.66|     |
| 4.5                   | 0.37| 0.10| 0.21 |4.26 | 3.22|     |     |     | 8.25 |     |
| 1                     | 0.26|     |     |     |     |0.26|     |     | 0.40 |     |

A- 4: Wave Period Rose for NDBC Station 46237 San Francisco Bar
APPENDIX B
Published Maps
EXHIBIT C: FLOOD HAZARD INFORMATION

NOTES TO USERS

To facilitate and expedite access to the Flood Insurance Rate Maps (FIRM), mapping services evaluated by Coastal California, and floodplain management services. FIRM data can be utilized by Federal, State, local, and non-governmental agencies, floodplain management authorities, engineers, developers, property owners, and the general public for various purposes including:

1. Assessment of flood insurance rates
2. Determination of flood zones
3. Identification of special flood hazard areas
4. Evaluation of flood risk
5. Planning for floodplain management

For current floodplain data, including floodway data and non-updated FIRM panels, please visit the FEMA Flood Map Service Center at http://msc.fema.gov.

Revised Flood Insurance Rate Maps (FIRM) for the above listed communities are being distributed by the State Flood Insurance Program and the Flood Insurance Study Program.

To determine eligibility for flood insurance, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

Other floodplain management services are available through the Coastal California Floodplain Management Program, including:

1. Floodplain program reviews
2. Technical assistance
3. Floodway studies
4. Floodproofing plans

For more information, contact Coastal California at 1-800-638-6620 or visit their website at http://msc.fema.gov.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

Other floodplain management services are available through the Coastal California Floodplain Management Program, including:

1. Floodplain program reviews
2. Technical assistance
3. Floodway studies
4. Floodproofing plans

For more information, contact Coastal California at 1-800-638-6620 or visit their website at http://msc.fema.gov.

Length and width of floodplains are defined as the area that is inundated by floodwater over two or more elevations as well as the area that would be inundated by a single elevation.

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METHOD OF PREPARATION

Tsunami inundation modeling was performed for the counties of Marin, Sonoma, and Santa Clara (Cohesive Sediment Coasts) and the coastal counties along the Central Coast (Cohesive Sediment Coasts). Each coast was divided into segments for modeling purposes. The whole coastline was divided into segments. The models were then run for each segment, and the results were combined to create a complete map of the coastline.

The models used for this project were developed by the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Geological Survey (USGS). The models were calibrated and verified against historical tsunami events and other data to ensure accuracy.

The maps created from these models are intended for use in emergency planning and public awareness. They provide information on the potential extent of tsunami inundation in the event of a tsunami. However, it is important to note that these maps are not intended to be used for building codes or other regulatory purposes.

DISCLAIMER

This map is intended for informational purposes only and should not be used for any regulatory or legal purposes. It is provided "as is" without warranty of any kind, either express or implied, including but not limited to the implied warranties of merchantability, fitness for a particular purpose, or non-infringement.

The California Emergency Management Agency and its contractors are not responsible for any errors or omissions, or for any results obtained from the use of this map. The user of this map assumes all liability and risk that may arise as a result of using this map.
APPENDIX C:
INUNDATION MAPS
MEMORANDUM

To: Lorie Tinfow, City Manager
    Anne Stedler, Economic Development Manager
    City of Pacifica

From: Tim Kelly

Date: September 9, 2016

Subject: Beach Blvd Site: Developer Selection

Keyser Marston Associates, Inc. (KMA) has been requested by the City of Pacifica to evaluate the development proposals submitted. The focus of KMA assessment is on developer qualifications and proposed business terms. The Beach Blvd site is approximately 3 acres. In October 2015, the City approved a developer selection process.

Summary

The respondents to the RFP and their proposals were evaluated with a primary goal of having a hotel development on the site. The reasons include:

- Market supports a new hotel project
- Benefits to the City, e.g. catalyst project and impact on Palmetto Avenue ‘Main Street’ and business and leisure travel in Pacifica
- Revenue to the City: 12% transient occupancy tax (TOT) and land sale proceeds
- Coastal Commission’s stated preference for visitor-serving amenities such as hotel and stated identification of housing as the third and lowest priority at this location
To: Lorie Tinfow, Anne Stedler
Subject: Beach Blvd Site: Developer Selection

September 9, 2016

Page 2

The criteria considered in evaluating the proposals included:

- Experience in developing hotels
- Understanding the local hotel market and the opportunity
- Relationship with a major hotel brand or comparable evidence of standards and competitive marketing/reservation capacity
- Understanding the process with approvals yet to be obtained from the City and the Coastal Commission
- Financial resources to fund entitlement process and construction
- Concept and vision for catalyst project to strengthen Pacifica with an active and vibrant destination

Also consideration was given to the feasibility of the hotel not being dependent on other land uses beyond the hotel and restaurant, that is the hotel and restaurant should be able to proceed as a standalone project since the hotel is the City’s priority. The feasibility and program of a hotel should not be subject to the inclusion of another major land use component.

The desire is for the hotel to proceed as quickly as possible, subject first to review from the public, the Planning Commission, the City Council and the Coastal Commission. A Purchase and Sale Agreement will not be presented to the City Council for its consideration until CEQA is completed and decisions have been reached on general project layout, design, and other related matters. The Purchase and Sale Agreement will be subject to review and approval by the City Council.

The respondent selected by the City Council will be required to fund all costs related to regulatory approvals, including applying for entitlements from the City and the Coastal Commission. The respondent will be required to fund CEQA. The respondent’s financial obligation to fund predevelopment and regulatory costs are under the condition that there is no guarantee of approvals, either from the City or the Coastal Commission.

KMA concludes that Friend Development Group, LLC is the respondent that best fits the requirements to develop a hotel on the Beach Blvd. site. The proposed project includes:

- Approximately a 120 key select service hotel
- Affiliation with Hilton Hotels & Resorts
- Restaurant space of approximately 6,000 square feet serving three meals per day
- Roof top deck and lounge overlooking the Pacifica Pier and the ocean and offering amenities serving both hotel guests and residents with connection to restaurant space
- Replacement of the 58 public parking spaces on site.
Friend Development Group, LLC recently has developed several major hotels, including:

- Hyatt Place in Yonkers, New York with 155 keys
- Hampton Inn Brooklyn Downtown with 117 keys; a second phase with 148 keys is under construction
- Hampton Inn & Suites by Hilton in Poughkeepsie, New York with 130 keys
- Homewood Suites by Hilton in Stratford, Connecticut with 135 keys

James H. Friend is the managing member of Friend Development Group, LLC. The following is an excerpt on his background:

“Specialize in hotel development both in the U.S. and overseas. Many years of active, hands-on development expertise. Have developed numerous hotels for own account as well as in advisory capacity. Excellent knowledge of all major hotel brands and their particular requirements, including Hilton, Marriott, Hyatt, Starwood, Intercontinental, numerous luxury brands as well as independent luxury and boutique hotels. Have extensive experience in ground-up development, renovations, adaptive re-use, mixed-use developments, urban, suburban, resort, major and minor mixed-use developments. Particular expertise regarding real estate entitlement matters.

Have arranged financing for more than $500 million of hotel and real estate transactions. Extensive experience financing large and complicated real estate projects. Have partnered with and advised NYSE companies, major institutions, REIT’s, high net worth family offices, banks and privately held companies in a wide range of real estate product types including hotels, retail, assisted living, multi-family, mixed-use and more. My personal legal expertise brings considerable added value. In addition, since 2011 I have been on the board of Condor Hospitality Trust, Inc. and in 2012 became chairman of the board of directors.”

Friend Development Group, LLC has a long relationship with Hilton Worldwide. The branding of the hotel with Hilton is an important element in the success of the project from Friend’s perspective. Friend understands the context of the location and how the hotel would fit within the overall hotel market on the north peninsula. Friend also understands that the project needs to be special and distinctive in the marketplace and not simply a traditional select service hotel.

Stonehill & Taylor Architects, P.C. of New York City are the architect for the proposed hotel. The firm is an architecture and interior design firm and was established in 1986. One of the primary focuses of the firm is hospitality. The firm has designed dozens of select service, full service, and resort hotels throughout cities in the United States, including New York City, Boston, Minneapolis, New Orleans, Phoenix and San Francisco.
Significant economic benefits to the City will be realized with the opening of the hotel. The benefits include:

- Catalyst project representing an approximately $30 million investment that will serve visitors to Pacifica as well as residents
- 35,000 occupied room nights at stabilization
- Annual TOT (transient occupancy tax) of approximately $900,000 at stabilization
- Other municipal revenues, such as property taxes and sales taxes
- Land payment

In conclusion, KMA has identified Friend Development Group, LLC as the respondent that has the best experience with hotel development for a site that requires significant effort and resources to undertake the process for regulatory approvals and understands that the project needs to be special and distinctive in the marketplace and not simply a traditional select service hotel.