Contents

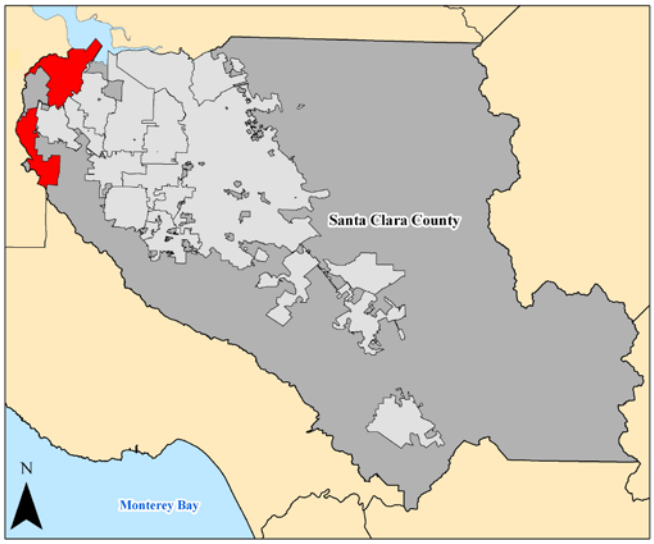
SECTION 18 CITY OF PALO ALTO

18.1 INTRODUCTION

This City of Palo Alto Annex serves as an annex to the Santa Clara County Local Hazard Mitigation Plan which is an annex to the 2010 Association of Bay Area Local Hazard Mitigation Plan, *Taming Natural Disasters*. Pursuant to the Disaster Mitigation Act of 2000, a signed adoption resolution confirms the City Council adopted this annex.

This annex is an update to the City's annex to the 2005 Association of Bay Area Local Hazard Mitigation Plan, Taming Natural Disasters, as adopted on December 12, 2005.

Part of the metropolitan San Francisco Bay Area and the Silicon Valley, Palo Alto is located within Santa Clara County and borders San Mateo County.



The City's boundaries extend from San Francisco Bay on the east to the Skyline Ridge of the coastal mountains on the west, with Menlo Park to the north, and Mountain View to the south. The City encompasses an area of approximately 26 square miles, of which one-third is open space. The city shares its borders with East Palo Alto, Los Altos, Los Altos Hills, Stanford, Menlo Park, Mountain View, Portola Valley, and portions of unincorporated San Mateo County and Santa Clara County (including the unincorporated areas of Cupertino and Saratoga in the foothills). It is named after a redwood tree called El Palo Alto. The city includes portions of Stanford University and its affiliates, is headquarters to a number of Silicon Valley high-technology companies, including Hewlett-Packard, VMware, Tesla Motors, and IDEO, and has served as an incubator to several other high-technology companies, such as Google, Facebook, Logitech, Intuit, Sun Microsystems, and PayPal. As of the 2010 census, the City had a total population of 64,403 residents.

A blend of business and residential neighborhoods, anchored by a vibrant downtown, defines Palo Alto's unique character. A charming mixture of old and new, Palo Alto's tree-lined streets and historic buildings reflect its California heritage. At the same time, Palo Alto is recognized worldwide as a leader in cutting-edge development, as a quintessential part of Silicon Valley.

Utilities

Unlike surrounding communities, electric, water, gas and wastewater service within city limits are provided by the City of Palo Alto. A minor exception is a rural portion of the city limits in the foothills area, west of Interstate 280, which gets gas and electric service from Pacific Gas and Electric Company (PG&E).

The Water, Gas and Wastewater Division (WGW) operates water, gas, and wastewater distribution networks within the city limits. Natural gas is purchased from third parties and delivered to Palo Alto via PG&E's gas transmission pipeline network. The city operates gas meters and the distribution pipelines. Water is supplied by the San Francisco Public Utility Commission's Hetch Hetchy system through 5 interconnection points. Emergency water is available through interconnects to adjacent systems and through wells located within the City limits.

The City operates its own electric power distribution network and telemetry cable network. The City is connected to PG&E's electric transmission system, which brings power from several sources to the City. Palo Alto is a member of a joint powers authority (the Northern California Power Agency), which cooperatively generates electricity for government power providers such as the Cities of Santa Clara, Lodi, Lompoc, Alameda and Healdsburg.

Transportation

Palo Alto is served by two major freeways, Highway 101, and Interstate 280, and is traversed by the Peninsula's main north-south boulevard, El Camino Real (SR 82).

The city is also served indirectly by State Route 84, which traverses the Dumbarton Bridge to the north. Palo Alto has only one major cross-town arterial, Page Mill Road / Oregon Expressway, which completely connects the two freeways.

Palo Alto is served by Palo Alto Airport of Santa Clara County (KPAO), one of the busiest single-runway general aviation airports in the country. In addition to private pilot use, the Airport is a refueling and service hub for air ambulance helicopters such as Life Flight and CalStar and is also used for patient transport and related support for Stanford Hospital, the Palo Alto Medical Foundation, and other such charitable or medical entities.

Train service is available via Caltrain, with service between San Francisco and San Jose and extending to Gilroy. Caltrain has two regular stops in Palo Alto, one at University Avenue (local and express), and the other at California Avenue (local only). A third, the Stanford station, located beside Alma Street at Embarcadero Road, is used to provide special services for

occasional sports events (generally football) at Stanford Stadium. The University Avenue stop is the second most popular (behind 4th and King in San Francisco) on Caltrain's entire line.

The Santa Clara Valley Transportation Authority (VTA) provides primary bus service through Palo Alto with service to the south bay and Silicon Valley. The San Mateo County Transit District (SamTrans) provides service to San Mateo County to the north. The Stanford University Free Shuttle (Marguerite) provides a supplementary bus service to and from the campus, which circulates frequently, and provides service to major points in Palo Alto.

RESOLUTION NO. 8580

RESOLUTION OF THE COUNCIL OF THE CITY OF PALO ALTO APPROVING THE ABAG REPORT "TAMING NATURAL DISASTERS" AS THE CITY OF PALO ALTO'S LOCAL HAZARD MITIGATION PLAN

WHEREAS, the Bay Area is subject to various earthquake-related hazards such as ground shaking, liquefaction, landsliding, fault surface rupture, and tsunamis; and

WHEREAS, the Bay Area is subject to various weather-related hazards including wildfires, floods, and landslides; and

WHEREAS, the City of Palo Alto recognizes that disasters do not recognize city, county, or special district boundaries; and

WHEREAS, the City of Palo Alto seeks to maintain and enhance both a disaster-resistant City and region by reducing the potential loss of life, property damage, and environmental degradation from natural disasters, while accelerating economic recovery from those disasters; and

WHEREAS, the City of Palo Alto is committed to increasing the disaster resistance of the infrastructure, health, housing, economy, government services, education, environment, and land use systems in the City, as well as in the Bay Area as a whole; and

WHEREAS, the federal Disaster Mitigation Act of 2000 requires all cities, counties, and special districts to have adopted a Local Hazard Mitigation Plan to receive disaster mitigation funding from FEMA; and

WHEREAS, ABAG has approved and adopted the ABAG report Taming Natural Disasters as the multi-jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area.

NOW, THEREFORE, the City Council of the City of Palo Alto does hereby RESOLVE as follows:

SECTION 1. The City of Palo Alto approves the ABAG multi-jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area entitled "Taming Natural Disasters" and adopts the City of Palo Alto Annex thereto.

SECTION 2. The City of Palo Alto commits to continuing to take those actions and initiating further actions, as

appropriate, as identified in the City of Palo Alto Annex of that multi-jurisdictional Local Hazard Mitigation Plan.

SECTION 3. The Council finds that this is not a project under the California Environmental Quality Act and, therefore, no environmental impact assessment is necessary.

INTRODUCED AND PASSED: December 12, 2005

AYES: BEECHAM, BURCH, CORDELL, FREEMAN, KISHIMOTO, KLEINBERG, MORTON, MOSSAR, OJAKIAN

NOES:

ABSENT:

ABSTENTIONS:

ATTEST:

City Clerk

acting Mayor

APPROVED AS TO FORM:

Senior Asst. City Attorney

APPROVED:

City Manager

Director of Administrative Services

Director of Planning and Community Environment

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18.2 INTERNAL PLANNING PROCESS

The City of Palo Alto participated in the regional planning process coordinated by ABAG and the local planning process coordinated by Santa Clara County OES as noted in Section 3 of this plan. Kenneth Dueker, J.D., Director, Emergency Services for the City of Palo Alto, assumed management of this internal process, subsequent to numerous retirements and staff changes in the city during the drafting of this plan.

The City of Palo Alto's internal planning team included the following individuals:

Steve Emslie, Deputy City Manager, City Manager's Office
Linda Clerkson, Public Information Officer, City Manager's Office
Dennis Burns, Police Chief and Interim Fire Chief
Mark Venable, A/Assistant Chief, Palo Alto Police Department
Charles Cullen, Director of Technical Services, Palo Alto Police Department
Catherine Capriles, A/Deputy Chief, Palo Alto Fire Department
Curtis Williams, Director, Planning Community & Environment Dept.
Larry Perlin, Chief Building Official, Planning Community & Environment Dept.
Steven Turner, Planning Manager, Planning Community & Environment Dept.
Valerie Fong, Director, City of Palo Alto Utilities Dept.
Dean Batchelor, Assistant Director, Ops., City of Palo Alto Utilities Dept.
Tom Kaiser, Safety & Security Coord., City of Palo Alto Utilities Department
Tomm Marshall, Assistant Director, Engineering, City of Palo Alto Utilities Dept.
Jane Ratchye, Assistant Director, Resource Management, City of Palo Alto Utilities Dept.
Greg Betts, Director, Community Services Department
Mike Sartor, Director, Public Works Dept.
James Allen, Manager, Wastewater Quality Plant, Public Works Dept.
Paul Dornell, Management Spec., Public Works Dept.
Phil Bobel, Interim Assistant Director, Public Works Dept.
Joe Teresi, Sr. Eng., Public Works Dept. (flood and drainage)
Melissa Tronquet, Sr. Deputy Attorney, City Attorney's Office

Public Outreach

The City of Palo Alto notified residents and businesses of the hazard mitigation planning process by distributing promotional announcements regarding the public opportunity to respond to the online survey discussed in Section 3.2.6. A copy of the survey is included in County Attachment 7: Survey Outreach Materials, found in Section 9.7. The following media was utilized:

- Press Release distributed to all local media
- City Website (http://www.cityofpaloalto.org)
- Email to 700 city Emergency Services Volunteers (incl. former volunteers)

Copies of these outreach announcements are included in Section 18.7, Palo Alto Attachment 1: Palo Alto Outreach Materials.

Survey Results

On November 1, 2010, the Local Planning Team released an online survey to solicit public input regarding concerns for hazard risk. The Local Planning Team also used this survey to gauge the level of public preparedness for emergencies. The survey responses received from the City of Palo Alto residents are summarized below:

1. 50 out of 541 survey respondents were from the City of Palo Alto.
2. Respondents were asked which five hazards, out of the 31 hazards the LPT identified, are of most concern to their neighborhood or home. Below are responses from the City of Palo Alto (in order of most responses):

Table 18-1: Hazards of Most Concern

Hazard	**Number of Responses**
Infrastructure: Water System Disruption (no potable water)	40
Earthquake: Ground Shaking	37
Infrastructure: Electrical System Disruption (no power)	32
Infrastructure: Energy System Disruption (no gas)	18
Flood	17
Infrastructure: Transportation Disruption (blocked roads / failed bridges)	16
Infrastructure: Wastewater System Disruption (sewer backup)	15
Hazardous Materials Spills (chemical/biological)	13
Infrastructure: Telecommunication System Disruption (no phone / cell service)	11
Additional Hazard *	10
Earthquake: Liquefaction	9
Disease and Outbreak	8
Drought	6
Earthquake: Surface Rupture	5
Wildfire	5
Solar Storm	2
Agricultural Pests and Diseases	1
Delta Levee Failure	1
Expansive Soils	1
Heat (extreme heat)	1
Land Subsidence (soil compaction due to subsurface water removal)	1

Hazard	Number of Responses
Wind (high winds)	1
Bay Area Silting	0
Dam Failure	0
Earthquake: Landslides	0
Freeze	0
Hailstorm	0
Landslide and Debris flow	0
Thunder/Lightning Storms	0
Tornado	0
Tsunami	0
Volcano	0

* Respondents noted the following additional hazards: Sea level rise, hazardous materials spills and toxic fume releases caused by earthquakes, lack of street light, speeding vehicles, terrorism, EPA levee failure, urban fire, and the releases of toxic chemicals from businesses in town

3. Respondents were asked if a severe hazard event occurred today, such that all services were cut off from their home and they were unable to leave or access a store for 72 hours, which items they would have readily available. Below is a summary of responses from the City of Palo Alto respondents:

Table 18-2: Items Readily Available to Respondents

Item that is Readily Available	Responses
Flashlight (with batteries)	50
First Aid Kit	46
Blanket(s)	45
Canned / Non-perishable Foods (ready to eat)	44
Portable AM/FM Radio (solar powered, hand crank,or batteries)	44
Potable Water (3 gallons per person)	40
Extra Medications	36
Cash	35
Handheld "Walkie-Talkie" Radios (with batteries)	29
What else is in your emergency kit? *	24
Important Family Photos/Documentation in a water and fire proof container	21

***** Respondents noted the following additional items in their emergency kits: tools, fuel, tarps, tents, sleeping bags, plastic sheeting and a staple gun to cover broken windows, camping gear, gloves, hard hat, shovel, wire, tree cutters, water purification tablets, filter masks, cooking supplies, fire extinguisher, Amateur (ham) radio, propane stove, generator, shoes, clothes, matches, gas shutoff

tool, safety glasses, flares, candles, ARES/RACES Go Kit, rope, garbage bags, duct tape, cooking coals, standard military issued survival kit, flash drive with important photos and documents, paper and pens, books, extra old cell phones, and family/emergency contact list

4. Respondents were asked if they were familiar with the special needs of their neighbors in the event of a disaster situation.

- 29, or **60.4%** of respondents, answered that they **are not** familiar with the special needs of their neighbors.
- 19, or **39.6%** of respondents, answered that they **are** familiar with the special needs of their neighbors.

5. Respondents were asked if they are trained members of their Community Emergency Response Team (CERT).

- 35, or **71.4%** of respondents indicated that they **are part of CERT**.
- 2, or **4.1%** of respondents, indicated that they are not part of CERT, but **would like to learn more about CERT.**
- 12, or **24.5%** of respondents, indicated that they are not part of CERT and **are not interested** in being a trained CERT member.
- 1 respondent skipped this question.

Respondents were asked to share why they are a trained CERT member or why they are not part of CERT. The received responses are listed below:

- First responders focus on the big problems that only they can address. CERT attempts to fill the gap by training and equipping residents to safely respond to less intensive emergencies where the professionals are too overwhelmed to respond.
- We live in earthquake country.
- I am a member of CERT so that I am aware and informed and so I can contribute to helping my neighbors.
- To be prepared for a disaster and to help my neighbors and community
- CERT, to give back to the community and build personal skills
- Helps meet a critical need
- I was trained in CERT many years ago and I have forgotten a lot
- Not part because I am already overwhelmed with family responsibilities.
- My husband is a CERT HAM radio member
- I have limited time, but I have received advanced first aid training and have participated in the amateur radio emergency communications program.
- In April 2007, we had a power outage at 10pm. Ten of our neighbors went running around trying to find out what happened. We decided after the power outage cause was known that we should get prepared. At a safety fair, we signed up for CERT training (CERT).
- To be knowledgeable, prepared, and assist myself and others in the event of an emergency
- CERT is not the best use of citizen's time for training. I am trained in Personal Emergency Preparedness (PEP) and I am SEMS/NEMS trained. Citizens should be trained to take care of themselves and neighbors for 72 hours and not be utilized to assist first responders.

6. Respondents were asked what the most important thing local government can do to help communities be more prepared for a disaster. The following summarizes the 34 responses received:

- Promote emergency preparedness and ensure that citizens have water and food for 72 hours and have an emergency plan for their family
- Invest in infrastructure resiliency
- Seismic strengthening of infrastructure
- Citizen and City training/education and exercises (drills)
- City Emergency Communication
- Promote emergency awareness (through events and mailings)
- Create a disaster plan and make sure communities within City know of plan
- Create a Block Coordinator Program and identify block captains to carryout emergency response plans
- Help coordinate CERT, PAN, CERT, and other organizations in Palo Alto
- Fund and support CERT and CERT programs
- Create stockpiles (food, water, etc) in case of emergency
- Encourage police/fire/utilities personnel to live in Palo Alto or within 5 miles
- Regionalize EOC operations for local agencies and give the lead to the Santa Clara County Fire department

7. Respondents were asked if they live in an apartment building or home with a living space above a garage or parking area.

- 43 or **87.8%** of respondents indicated that they **do not** live in an apartment or home with living space above a garage or parking area.
- 6, or **12.2%** of respondents, indicated that they **do** live in an apartment building or home with living space above a garage or parking area.
- One respondent skipped this question.

Those respondents who indicated that they do live in an apartment building or home with living space above the garage or parking area were asked to describe their level of concern for the building to collapse in a large earthquake event. 1 respondent indicated “Extremely Concerned”, 6 indicated “Moderate Concern”, and 1 respondent indicated “Very Little Concern”.

8. Respondents who are homeowners were asked if they have adequate homeowners insurance to cover the hazards that could impact their home. Below is a summary of responses:

Table 18-3: Adequate Homeowners Insurance

Answer	Responses
Yes, my insurance coverage should be adequate	30
No, I don't believe my insurance coverage would be adequate for a major disaster	14
Unsure	4
I do not have an insurance policy	0
Not applicable, I rent my current residence	2

9. Respondents were asked if they have earthquake insurance. Below is a summary of responses:

Table 18-4: Earthquake Insurance

Answer	Responses
Yes, I own my home and have earthquake insurance.	23
Yes, I rent my home and have earthquake insurance.	0
No, but I am interested in reviewing earthquake insurance options.	1
No, earthquake insurance is too expensive.	22
No, I do not need earthquake insurance.	1

10. Respondents were asked if they have flood insurance. Below is a summary of responses:

Table 18-5: Flood Insurance

Answer	Responses
Yes, I own my home and have flood insurance.	11
Yes, I rent my home and have flood insurance.	0
No, but I am interested in reviewing flood insurance options.	2
No, I do not need flood insurance	33

11. Respondents indicated the following as additional insurance listed for their home or property:

- **Comprehensive insurance**
- **Renter's insurance**
- **Fire**
- **Umbrella liability**
- **Theft**
- **Homeowners**
- **Worker's compensation insurance**

12. Respondents were asked what they are doing to their property or within their home to reduce future damage from the hazards identified above. Below is a summary of responses:

Table 18-6: Property Changes to Reduce Damage from Hazards

Property Mitigation	Responses
Roof retrofit using fire resistant material	20
Seismic retrofit of the structure and/or foundation	18
Other *	10
Defensible space landscaping (clear vegetation around house to reduce wildfire risk)	9
Installed backflow prevention device(s)	7
Strengthened openings to reduce high hazard wind risk	7
House elevation or first floor modification to prevent flood damage	3

*The responses to "Other" were: "Re-enforcing foundation attachments and cripple walls", "seismic inspection of house", "Cabinets bolted to walls and frame of house bolted to foundation", and "home has been checked for structure in earthquakes, do not have flood issues, may purchase a propane generator."

13. Respondents were asked if they work in Santa Clara County.
    - 27, or **54%** of respondents, indicated that they **do** work in Santa Clara County.
    - 23, or **46%** of respondents, indicated that they **do not** work in Santa Clara County.

14. Respondents were asked if their place of work is in an area susceptible to natural hazards. Below is a list of natural hazards and responses from survey respondents:

Table 18-7: Place of Work in Hazard Areas

Natural Hazard	Response
Earthquake fault zone	15
I don't know	9
Liquefaction zone	8
Other *	6
High-risk flood zone	5
Wildland urban interface (wildfire risk area)	3
Landslide risk area	0

***** The responses to "Other" were: "It's a commercial zone with many hazards and chemicals", "not employed", and "retired"

15. Respondents were asked if their employer has a plan for disaster recovery in place.
    - 20, or **58.8%** of respondents, **indicated that their employer does have a disaster recovery plan in place.**
    - 8, or **23.5%** of the respondents, **indicated that their employer does not have a disaster recovery plan in place.**
    - 6 respondents were **unsure** if their employer has a disaster recovery plan in place.

- 16 respondents skipped this question.

16. Respondents were asked if their employer has a workforce communications plan to implement following a disaster so they may contact their employees.

- 15, or **45.5%** of respondents indicated that their **employer does** have a workforce communications plan.
- 12, or **36.4%** of respondents indicated that their **employer does not** have a workforce communications plan.
- 6, or **18.2%** of respondents indicated that they are **unsure** if their employer has a workforce communications plan.
- 17 respondents skipped this question.

17. Respondents were asked to list any studies that they are aware of being conducted within their community or the county regarding the risk to future hazard events. 7 respondents replied to this question. These answers are summarized below. 43 respondents skipped this question.

- Earthquake and ground shake study
- Flood, creeks, and levees
- Pandemic
- CERT risk assessment inventories
- USGS study of 7.0 earthquake, 60% chance in the next 30 years
- Emergency potable water locations
- Most vulnerable buildings

18. Respondents were asked what recommendations they have for Santa Clara County and the incorporated cities to improve identification, prioritization, and implementation of actions intended to reduce future damage and increase resiliency. The following recommendations were received:

- Improve and harden all critical lifeline infrastructure: water delivery, communications, roads and bridges, hospitals and clinics, health and sanitation services.
- Require local companies to have minimum disaster preparedness plans in place
- Require retrofit over a period of time of soft story/unsafe buildings (mostly apartments in Palo Alto)
- Encourage the Water District to improve infrastructure
- Inspect older homes to see if they should be updated to meet current earthquake codes
- Inventory critical infrastructure
- Create a plan for CERT/CERT to observe infrastructure to save first responders for higher value work during an emergency
- Provide retrofit assistance (loans)
- Educate and train citizens through CERT or BPC Program

19. Respondents were asked to recommend any companies or local associations that should be involved in the Santa Clara County hazard mitigation planning process. The recommended

organizations are listed below and were given the opportunity to review the draft plan as noted in the following section.

- NASA Ames
- Barron Park Association

20. Respondents were asked if they would like to review and comment on a draft of their jurisdictions annex to the Multi-Jurisdictional Multi-Hazard Mitigation Plan.

- 17, or **45.9%** of respondents **said they would** like to review and comment on the draft plan.
- 20, or **54.1%** of respondents said **they would not** like to review and comment on the plan draft.
- 13 respondents skipped this question.

14 respondents who said they would like to review and comment on the draft plan included their contact information and were given the opportunity to review the draft plan as noted in the following section.

21. Respondents were asked to provide any additional comments/suggestions/questions. The responses are summarized below:

- Each city needs a disaster plan and implementation by communication with the local neighborhoods of that City. It is essential that the plan be in-place and ready to go when the disaster hits.
- I live near an industrial area and there is no coordination between the emergency response programs at those companies and those in the neighborhood
- More public reminders about disaster procedures in the community, more practice drills. Post and communicate information regarding what to keep on hand, when to replace the items, etc. Provide discounted emergency preparedness items that are recommended. Provide training for HAM radio. Basically, make it cheap and easy for people to get what they need to have on hand!
- I would love to understand what the contingency plan is for the breaking of the Hetch Hetchy pipeline which I understand from the maps crosses several fault lines. I would also love to understand what planning is in place for a wide outbreak of disease.

Review Opportunities

A review draft of this plan was submitted to Cal EMA on August 16, 2011, and subsequently forwarded to FEMA for review and comment regarding compliance with the Disaster Mitigation Act of 2000. During this time the review draft was available for public review on the websites of the Santa Clara County Office of Emergency Services and the Association of Bay Area Governments. No comments were received on the review draft, other than one from a community member in response to the City Council's initial attempt to adopt the resolution in March 2012.

On March 5, 2012, the Palo Alto City Council requested minor edits to the review draft prior to adopting the plan. Those edits have been incorporated.

18.3 CAPABILITY ASSESSMENT

18.3.1 Mitigation Progress

The City's primary objective is to protect human life through corrective action and measures to mitigate the risks, to the extent practicable, identified in the plan. New mitigation actions the City of Palo Alto has identified are discussed in Section 18.5.

18.3.1.1 Completed projects

In the past 5 years, electrical, mechanical, and information system upgrades have been made to a number of city buildings, making their occupants better able to deal with emergency situations. Seismic improvements have been completed on two libraries. Street resurfacing and traffic light improvements have been made, allowing for better response to emergencies and more robust evacuation routes.

A new storm water pump station was constructed adjacent to San Francisquito Creek downstream of Highway 101 in 2007. Operation of the pump station decreases the likelihood of street flooding in a 1,250-acre area of northeastern Palo Alto.

18.3.1.2 Current projects

Currently, a project is underway to rebuild Mitchell Park Library and Mitchell Park Community Center. The resulting buildings will be better able to withstand earthquakes and other emergencies. Upgrades, which will make seismic and other improvements to the Main Library and the Arts Center, are in the design phase. Electrical and mechanical upgrades are being made to City Hall and will be completed in the summer of 2011.

The City has formed an Infrastructure Blue Ribbon Commission (IBRC) tasked with identifying critical buildings, facilities, and related resources in need of improvement.[1] The Public Safety Building is one of their current projects.

18.3.2 Staff and Organizational Capabilities

18.3.2.1 Departmental Responsibilities

1 http://www.cityofpaloalto.org/knowzone/agendas/infrastructure_blue_ribbon_commission.asp

The City of Palo Alto operates several departments with capabilities for implementing hazard mitigation strategies. These departments and their roles and responsibilities are summarized in the following table.

Table 18-8: Key Departments in the City of Palo Alto

Key Departments in the City of Palo Alto (alphabetical order)
Departments
Community Services Department The Community Services Department operates the Cubberley Community Center along with various parks and other facilities, many of which are identified for use as shelters, evacuation points or have other functions in a disaster. Further, the CSD Open Space Rangers are trained in wildland firefighting and also support the Police Department in patrolling parks and the Wildland Urban Interface (WUI). **Fire Department** The City of Palo Alto Fire Department provides services to the city and to Stanford University. The large number of high-technology businesses and the Stanford University campus increase the daytime population to over twice the residential baseline population. The Fire Marshal and fire inspector staff perform plan checks and other such functions to maintain the safety of buildings, as well as certain special events. **Planning and Community Environment Department** *Building Division* The mission of the Building Division is to ensure construction quality by reviewing construction plans for conformance to building codes, permit processing, and inspecting projects while under construction. *Planning Section* The Planning Section provides staff support for the Planning & Transportation Commission, the Architectural Review Board, the Historic Resources Board, and administers the City's housing programs as well as preparing and monitoring the Comprehensive Plan and providing long-range planning studies. This division also processes applications for planning entitlements. *Code Enforcement Program* The Code Enforcement Program promotes maintaining a safe and desirable living and working environment. We help improve the quality of our community **Police Department** The Palo Alto Police Department is committed to providing exceptional public safety services and taking a leadership role in building community partnerships. The Police Department is responsible for maintaining a core asset for emergency operations: the Communications Center, which provides dispatch for Palo Alto Police Department, the Stanford Department Public Safety (DPS) police, the Palo Alto Fire Department, as well as other government channels. This center serves as the 911 Public Safety Answering Point (PSAP) for the Palo Alto and Stanford communities. **Public Works Department** The Public Works Department is responsible for the approval, construction, maintenance and management of Palo Alto's public facilities, streets, sidewalks, street trees; parking lots and storm drains. The Public Works Department is also responsible for the administration and operation of the Palo Alto Regional Water Quality Control Plant; and administration of the National Flood Insurance Program. In

addition, Public Works maintains the entire City fleet with full equipment replacement, preventative maintenance and fueling.

Utilities Department
The Utilities Department is responsible for the approval, construction, maintenance and management of Palo Alto's public electric, fiber, water, gas, and wastewater collection facilities. The Utilities Department is also responsible for the maintenance and operation of the street light and traffic signal programs. In addition to having the responsibility for the infrastructure, the Utilities Department purchases all of the water, gas and electricity commodities used within the City.

With a clear hazard mitigation strategy, as outlined in this Local Hazard Mitigation Plan, the City's departments are able to implement their ongoing policies and programs with consideration of the identified hazard risks. In addition, these departments become aware of priority mitigation actions and can offer resources (financial or staffing) to assist with the implementation of those actions.

18.3.2.2 Technical Capability

For a successful mitigation program, it is necessary to have a diverse breadth of staff and technical capabilities. Planners, engineers, building inspectors, emergency managers, floodplain managers, people familiar with Geographic Information Systems (GIS), and grant writers are all essential to implementing mitigation actions. The following table summarizes the staffing capabilities available within the City of Palo Alto.

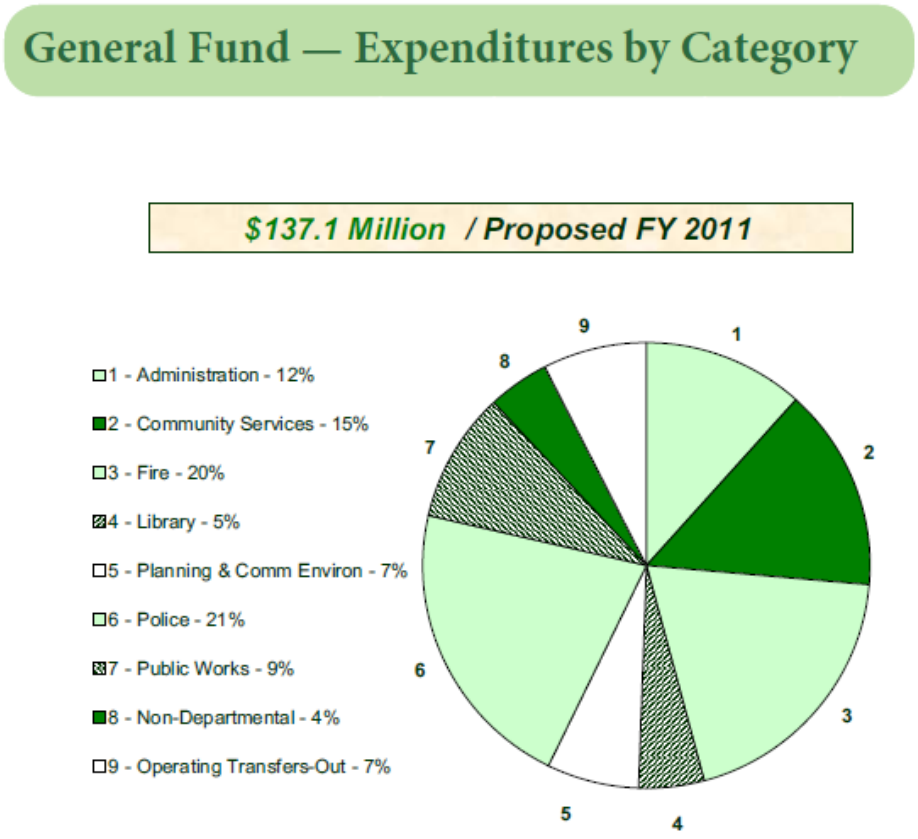
Table 18-9: Technical Capability Matrix

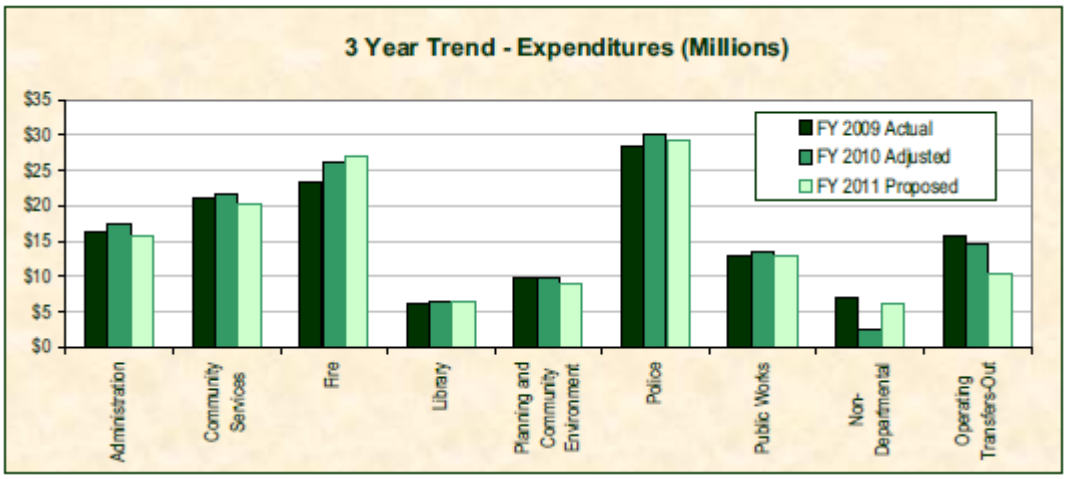
Technical Capability Matrix	
Land Use Planners	Planning Section
Emergency manager	Office of Emergency Services
Civil or Building Engineers	Building Division
Floodplain manager	Public Works
Staff knowledgeable about hazards	Public Works, Community Services, Utilities, Police, Fire
GIS staff	Information Technology (IT) Dept.
Grant writers	OES, Public Works, Utilities, Police, Fire (no full-time, however)

18.3.2.3 Fiscal Capability

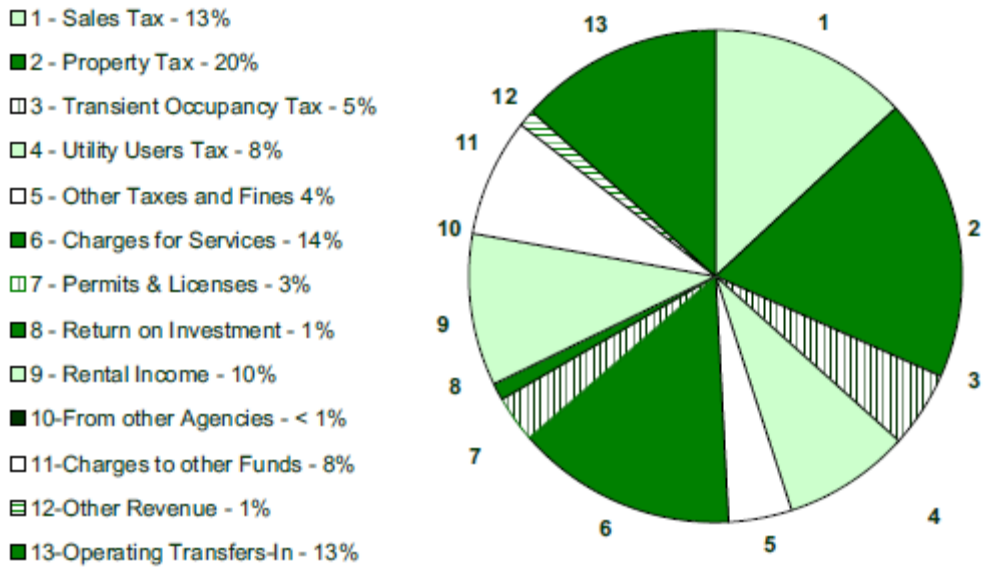
The following summarizes Palo Alto's fiscal capabilities in terms of the City's financial resources and allocated spending. Property Tax and Charges for Services are the primary sources of Palo Alto's financial resources. The City has allocated the majority of financial resources to Police, Fire and Community Services. These three categories are all relevant for implementing hazard mitigation actions.

In Utilities, the city collects, through our rates charged to customers, funds for maintaining or our improving our infrastructure and to fund our reserves in the event of damage or failure to key components of our infrastructure (such as a major water reservoir, or damage to electric substation equipment.) Utilities maintains Emergency Plant Replacement Reserves for each fund (electric, gas, water, wastewater collection, and fiber) that can be used to repair or replace key infrastructure components up to the City's insurance deductible amount (currently, $1 million). Additionally, Utilities has bond financed the $33 million emergency water supply project to increase the City's water storage volume, groundwater supplies, and pumping capacities for emergency response purposes.





$139.2 Million / Proposed FY 2011



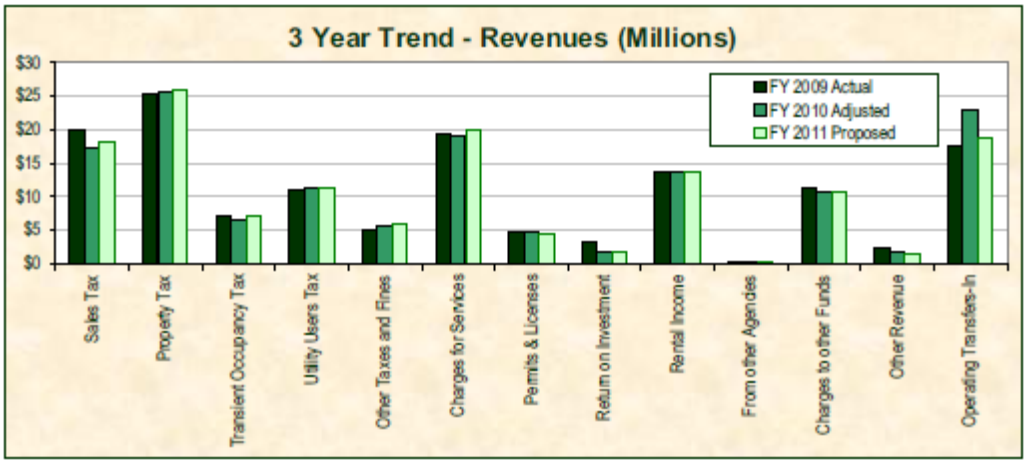


Table 18-10: Financing Mechanisms

Financing Mechanisms														
	Sales Tax	*Property Tax*	*Transient Occupancy Tax*	*Utility Users Tax*	*Other Taxes and Fines*	*Charges for Services*	*Permits and Licenses*	*Return on Investment*	*Rental Income*	*From other agencies*	*Charges to Other Funds*	*Other Revenue*	***TOTAL REVENUES***	*Operating Transfers-In*	***TOTAL SOURCE OF FUNDS***
	18,218	25,907	7,021	11,429	5,868	19,950	4,492	1,646	13,716	156	10,622	1,491	120,516	18,684	139,200

18.3.2.4 Policy or Program Capability

The City of Palo Alto has several plans and ordinances in place which provide ample opportunities for implementing the hazard mitigation strategy outlined in this plan.

18.3.2.4.1 Summary of Plans that Support Hazard Mitigation

Emergency Operations Plan

The Palo Alto Emergency Operations Plan (EOP), dated 2007, identifies the City's emergency planning, organization, and response policies and procedures. The EOP also addresses the integration and coordination with other governmental levels and volunteer agencies when required. It is meant to be considered as a preparedness document, intended to be read and understood before

an emergency occurs. The major purposes of the plan are to distinguish who is in charge, to ensure essential jobs are accomplished, to provide for the continuity of government, to help citizens and City staff understand the City's emergency organization, to provide guidance for disaster education and training, and to provide for the proper transfer of command during an emergency. The Plan consists of two parts: the Basic Plan and the Annexes.

The Basic Plan outlines how the City of Palo Alto fulfills its mandated requirements for emergency management. It addresses how the City will respond to disaster emergencies, from preparation through recovery. A hazard analysis and matrix are included in the plan. The responsibilities of each department are identified in the matrices, which are based on each identified hazard. Although the EOP lists several natural and man-made hazards that have the potential to affect Palo Alto, the City has focused its disaster planning efforts on nine of these hazards: earthquake, hazardous materials incident, flooding/dam failure/severe winter storm, wildland fires, urban fires, terrorism/nuclear attack/act of war, airplane accident, and public health/pandemic. Maps of hazard areas are included in the Plan.

One flood mitigation strategy that the City has implemented includes installing creek monitoring devices to ensure the most accurate and up-to-date information regarding potential flooding is made available. These devices provide creek level information. The images generated from the data can be monitored by residents though the City's website. City staff also monitor weather information to receive advance warning and prepare for upcoming storms. Another flood mitigation strategy described in this Plan is the seismic upgrading of the Boronda Lake dam.

Mitigation strategies for wildland and urban fires are also described in the Plan. Fire department response times, staffing and service levels, water supply, public education, code enforcement, and funding are the significant fire safety policy issues. Efforts to establish an emergency water supply system are underway and the system should be in place and operational in 2012. The emergency water supply project will provide Palo Alto with a self-sustaining emergency water supply.

The Basic Plan section of the EOP prescribes four phases of emergencies and disasters: Preparedness, Prevention, Response, and Recovery.

Preparedness: Preparedness entails any actions taken in advance of an emergency/disaster to develop operational capabilities and help communities respond to and recover from a disaster. Such measures include the construction and equipping of EOCs with warning and communications systems, recruitment and training of emergency management personnel, development of plans, procedures, arrangements, and agreements, and drill exercises of personnel and systems. Training for emergency response should be scheduled and conducted on an ongoing basis.

Mitigation/Prevention: Mitigation efforts include making adjustments to zoning variances, the building code, and reviewing mitigation plans, seismic safety elements, and other land use planning techniques. Within declared areas, management of non-profit special districts and the Palo Alto

Office of Emergency Services are responsible for identifying future projects that will substantially reduce the risk of future damage, hardship, loss, or suffering from a disaster. Identification of these projects occurs through updates to the City's Local Hazard Mitigation Plan.

Response: The City's emergency response efforts follow the NIMS/SEMS based organization structure. The activation of the Emergency Operations Center (EOC) occurs during this phase. Alerts to the public also occur during this phase. Alerts can be conducted through the City's Emergency Services website, through phone and e-mail lists, and through radio and broadcast stations.

Recovery: Recovery refers to those measures undertaken by an entity following a disaster that will return all systems (utilities, phones, government offices, etc.) to normal levels of service. Short term recovery includes debris removal, utility restoration, health services, and the abatement and demolition of hazardous structures. Long term recovery includes hazard mitigation activities, reconstruction of public facilities, and improved EOP and land use planning, and the effective integration of mitigation strategies into recovery planning operations.

The annexes contain details and supporting information on how Palo Alto will implement its emergency preparedness, response, and recovery operations. Operational checklists by emergency organization function, a Council Procedures Guide, hazard response checklists, and Palo Alto's Local Hazard Mitigation Plan are each given their own location in the annexes. State, County, and City organizational charts, hazard emergency evacuation maps, a glossary of key definitions and acronyms, and sample proclamations and ordinances are also included.

Comprehensive Plan

The Comprehensive Plan is the primary tool for guiding the future development of the City. On a daily basis the City is faced with choices about growth, housing, transportation, neighborhood improvement, and service delivery. A Comprehensive Plan provides a guide for making these choices by describing long-term goals for the City's future as well as policies to guide day-to-day decisions. The 1998-2010 City of Palo Alto Comprehensive Plan (Comp Plan) is the current document that guides land use decision in the City. City staff is preparing an amendment to the Comp Plan that, once adopted by City Council, will extend the current document through at least 2020. Discussions of local hazards, including goals, policies and programs to address these hazards, are contained within the Natural Resources, Land Use and Housing Elements of the Comprehensive Plan.

Natural Resources Element

Hazardous Materials

Hazardous materials are handled and stored on a number of properties in Palo Alto, primarily in the East Bayshore and San Antonio Road/Bayshore corridor, the University Avenue/Downtown Area, the South of Forest Area, and at Stanford Research Park. The City will continue to work towards remediation of contaminated sites and will prevent future contamination by following Best Management Practices. Palo Alto will also continue City permitting procedures for commercial and industrial storage, use, and handling of hazardous materials. Presently, to obtain a City permit requires the verification that the facility meets applicable City code requirements for the storage and handling of hazardous materials.

Earthquake

Past land use decisions in Palo Alto have not always taken hazards into consideration. Moreover, older buildings and infrastructure reflect the construction and engineering standards of their era, which in most cases fall short of current standards for seismic safety. As a result, a significant portion of the City would be at risk in the event of a major earthquake. The greatest hazards are associated with fault rupture and groundshaking, although liquefaction hazards are significant in the area east of Highway 101 due to the porous nature and high water content of the soil. Landslides, a hazard that is common in the foothills of Palo Alto, may result from heavy rain, erosion, removal of vegetation, or human activities. Settlement and subsidence due to groundwater withdrawal has historically been a problem in South and East Palo Alto, but has been largely halted by groundwater recharge efforts and reduced pumping. Seismically-induced flooding is a hazard due to the possibility of dam failure at Felt Lake, Searsville Lake, and Lagunita Reservoir, and the potential for levee failure near the Bay.

To help mitigate the damages that may result from a potential earthquake, Palo Alto will strictly enforce uniform building code seismic safety restrictions and provide incentives for seismic retrofits of structures in the University Avenue/Downtown area. The City will also allow development rights achieved through seismic upgrading of specified sites to be transferred to designated eligible receiver sites. Some parts of Palo Alto are at greater risk in a natural disaster than others. These areas could be zoned or otherwise regulated to reduce their development potential and require detailed geologic and engineering studies prior to development. The City already requires geologic and soils investigations for development southwest of Interstate 280. Similar requirements should be explored in other areas of the City prone to high geologic hazards.

Flooding

Flood hazards, including saltwater flooding from the Bay and freshwater flooding from creeks overflowing their banks, are also likely to occur in Palo Alto. The City would like to minimize exposure to flood hazards by adequately reviewing proposed development in flood prone areas and

by implementing the requirements of FEMA relating to construction in Special Flood Hazard Areas, as illustrated on Flood Insurance Rate Maps. Another policy the City would like to establish includes creating a standardized process for upgrading and evaluating the impacts of development on the City's storm drain system.

Fire

It is the City's goal to minimize exposure to wildland and urban fire hazards through rapid emergency response, a sufficient water supply, a proactive fire code enforcement, public education programs, and adequate emergency management preparation. Wildfires are primarily associated with homes built in the foothills. Fire hazard prevention in this area can be achieved through low-density zoning, design reviews of development, and vegetation management.

Emergency Management

Palo Alto minimizes exposure to all hazards through emergency management planning. As part of the preparedness process, various locations throughout the City are designated for shelter and emergency operations. Palo Alto also encourages public education that strongly encourages each household in the City to be prepared to be self-sufficient for at least 72 hours (2 weeks, preferred) after a major earthquake. The city has partnered with the Palo Alto Neighborhoods (PAN) organization to develop a Personal Preparedness 90-minute training for the general public, largely modeled on existing FEMA and Red Cross curricula. PAN's Block Preparedness Coordinator Program, in conjunction with the City's Emergency Services Volunteer Program (which includes ARES/RACES and CERT), works with the City to prepare residents and businesses for all hazards, ranging from crime to earthquakes. The City has held two annual citywide exercises, called Quakeville, to bolster these efforts. Neighborhood Watch and crime prevention are included in the BPC program.

Land Use Element

The amount of urban land in Palo Alto in 2010 will remain essentially the same as it was when the Comprehensive Plan was adopted in 1998, with growth occurring through infill and redevelopment. New non-residential growth will be limited (a limit of 3,257,900 square feet for commercial development), as well as the growth of Stanford University and the Lands Within the Airport Influence Area. Palo Alto would like to promote more mixed-use development, similar to the South of Forest Area (SOFA). It is the City's goal to retain undeveloped land west of the Foothill Expressway, west of the Junipero Serra, and in the baylands northeast of Highway 101 as open space.

Palo Alto recognizes that utility and other City infrastructure improvements need to be carefully designed to minimize negative environmental impacts. This applies throughout the City with special attention given to the baylands and foothills, where improvements should generally be located as

close as possible to access roads. The City should also continue with the undergrounding of utility wires.

Housing Element

The Housing Element is prepared to ensure that the population of Palo Alto has access to safe and affordable housing. To promote safe housing, the City has a housing code inspection and enforcement program. The City also enacts development regulations that encourage retention and rehabilitation of historic residential buildings, older multifamily buildings, and smaller single family residences. The City believes it is critical to use the development review process as a way to reduce exposure to hazards for new housing projects. The design and operation of new projects in risk-prone areas must consider relevant geologic, seismic, flood, and fire hazards.

Floodplain Management Ordinance

In an effort to reduce the risk of loss of life, health, and property due to periodic flood inundation, the In an effort to reduce the risk of loss of life, health, and property due to periodic flood inundation, the City of Palo Alto has adopted a Flood Hazard Regulations Ordinance, Palo Alto Municipal Code Chapter 16.52. The ordinance is designed to minimize loss of life, damage to private land development, public facilities and utilities, the need for rescue and relief efforts, business interruptions, and future blighted areas caused by flooding. The ordinance also ensures that property owners construct new and substantially-improved buildings in the Special Flood Hazard Area in a manner that protect the improvements from flood damage. The City Engineer is responsible for enforcing this ordinance.

To reduce flood losses, the ordinance includes methods and provisions to control the alteration of natural floodplains, stream channels, and protective barriers; to control filling, grading, dredging and other development that can increase flood damage; to regulate the construction of flood barriers which can divert flood waters or increase flood hazards in other areas; and to require that uses vulnerable to floods be protected against flood damage at the time of their construction. One of the provisions of this ordinance is that a development permit must be obtained before any construction or development begins and that certain construction standards such as; anchoring, building with flood resistant materials, and elevating and floodproofing, are required within an area of special flood hazard. The ordinance also enforces that new and replacement water and sanitary sewage systems should be designed to minimize flood water infiltration and discharge into flood waters. Standards are also included for subdivisions, manufactured homes, and recreational vehicles. Since floodways are extremely hazardous, no new development is permitted to be constructed in these areas unless certification by a professional engineer or architect is provided demonstrating that the development will not increase base flood elevations. This ordinance also has special regulations for new development within a coastal high hazard area. These regulations ensure that new construction is located on the landward side of the reach of mean high tide, the space below the lowest floor is free

of obstructions or constructed with breakaway walls and is not used for human habitation, there is no manmade alteration of sand dunes, and that fill is not used as structural support of a building.

18.3.2.4.2 Summary of Ordinances that Support Hazard Mitigation

Table 18-11: Availability of Ordinances that Support Hazard Mitigation

Availability of Ordinances that Support Hazard Mitigation								
Jurisdiction	*Flood Plain Management Ordinance*	*Zoning Ordinance*	*Subdivision Ordinance*	*Post-disaster Red/Rec. Ordinance*	*Building Code*	*Fire Code*	*National Flood Insurance Program*	*NFIP Community Rating System*
City of Palo Alto	Yes	Yes	Yes		Yes	Yes	Yes	Yes

The City of Palo Alto identified several ordinances and policies currently utilized for hazard mitigation in the matrix of regional mitigation strategies prepared by ABAG as part of the 2010 plan update. Below is a summary of these key ordinances and policies.

Flood Plain and NFIP: Palo Alto Municipal Code Chapter 16.52, Flood Hazard Regulations, was adopted by the City in order to comply with the National Flood Insurance Program (NFIP) and federal regulations. The ordinance is designed to minimize loss of life, damage to private land development, public facilities and utilities, the need for rescue and relief efforts, business interruptions, and future blighted areas caused by flooding. The ordinance also ensures that property owners construct new and substantially-improved buildings in the Special Flood Hazard Area in a manner that protect the improvements from flood damage.

Zoning: The zoning ordinance includes floodplain regulations, special requirements for hazardous waste facilities, instructions on the permit and approval process, and requirements for nonconforming uses.
http://www.amlegal.com/nxt/gateway.dll/California/paloalto_ca/paloaltomunicipalcode?f=templates$fn=default.htm$3.0$vid=amlegal:paloalto_ca

Fire: Fire prevention in Palo Alto is regulated by the California and International Fire Code. Both of these codes have been adopted by the City.
http://www.amlegal.com/nxt/gateway.dll/California/paloalto_ca/paloaltomunicipalcode?f=templates$fn=default.htm$3.0$vid=amlegal:paloalto_ca

18.3.3 National Flood Insurance Program

For decades, the national response to flood disasters was simply to provide disaster relief to flood victims. Funded by citizen tax dollars, this approach failed to reduce losses and didn't provide a way to cover the damage costs of all flood victims. To compound the problem, the public generally couldn't buy flood coverage from insurance companies, because private insurance companies consider floods too costly to insure. In the face of mounting flood losses and escalating costs of disaster relief to U.S. taxpayers, Congress established the National Flood Insurance Program (NFIP). The goals of the program are to reduce future flood damage through floodplain management, and to provide people with flood insurance. Community participation in the NFIP is voluntary.

The City of Palo Alto has participated in the National Flood Insurance Program since 1974. All residents of the City are eligible to purchase federal flood insurance. The City continues to maintain full compliance with the NFIP.

Since the previously-approved Hazard Mitigation Plan, the Federal Emergency Management Agency (FEMA) converted the Flood Insurance Rate Map (FIRM) for the City of Palo Alto from a paper format to a digital format and converted the vertical datum from NGVD29 to NAVD88. No new properties were added to the Special Flood Hazard Area (SFHA) as a result of the map update. City staff has imported the digital floodplain map data into the City's Geographic Information System (GIS).

City staff continues to regulate development activity in the Special Flood Hazard Area (SFHA) in order to ensure that new construction and substantial improvements are constructed with their lowest floor at or above the Base Flood Elevation. The City's flood hazard regulations are contained in Chapter 16.52 of the Palo Alto Municipal Code.

In order to facilitate the enforcement of the flood hazard regulations, City staff has incorporated FEMA's digital floodplain data into its Geographic Information System (GIS). This has resulted in more accurate identification of the properties located within the Special Flood Hazard Area and the Base Flood Elevations associated with those properties.

The City of Palo Alto continues to implement its floodplain management program and is in good standing with the Region IX Office of the Federal Emergency Management Agency. The City received good evaluations during audits conducted on its floodplain management program and for its participation in the Community Rating System in 2010.

The primary hurdle to effectively implementing the regulatory elements of the National Flood Insurance Program is public education and gaining public recognition of flood risk. Staff conducts public outreach on flood preparedness and provides adequate resources to answer public inquiries and to review land development applications in order to ensure compliance with the requirements of the National Flood Insurance Program.

18.3.3.1 Community Rating System (CRS)

The CRS is a voluntary part of the National Flood Insurance Program that seeks to coordinate all flood-related activities, reduce flood losses, facilitate accurate insurance rating, and promote public awareness of flood insurance by creating incentives for a community to go beyond minimum floodplain management requirements. The incentives are in the form of insurance premium discounts. CRS ratings are on a 10-point scale (from 10 to 1, with 1 being the best rating), with residents of the community who live within FEMA's Special Flood Hazard Areas (SFHA) receiving a 5% reduction in flood insurance rates for every Class improvement in the community's CRS rating.

The City of Palo Alto joined the Community Rating System in October 1991 and has a current class rating of 7. Properties within FEMA's Special Flood Hazard Areas in Palo Alto receive a 15% reduction in flood insurance rates. Properties outside the SFHA within Palo Alto receive a 5% discount in flood insurance rates.

18.3.3.2 Repetitive Loss Properties

The Federal Emergency Management Agency (FEMA) insures properties against flooding losses in the Bay Area through the National Flood Insurance Program. (http://www.fema.gov/about/programs/nfip/index.shtm)

As part of the process to reduce or eliminate repetitive flooding to structures across the United States, FEMA has developed an official Repetitive Loss Strategy. The purpose behind the national strategy is to identify, catalog, and propose mitigation measures to reduce flood losses to the relatively few number of structures that absorb the majority of the premium dollars from the national flood insurance fund.

A *repetitive loss property* is defined by FEMA as "a property for which two or more National Flood Insurance Program losses of at least $1,000 each have been paid within any 10-year period since 1978."

The City of Palo Alto has five repetitive flood loss properties. The following is a table summarizing repetitive losses in the City.

City and County	Total Payments ($)	Average Payment ($)	Losses	Properties	Properties (as of 2004)
Palo Alto	692,067.82	40,709.87	17	5	6

There are 5 Repetitive Loss Properties in the City of Palo Alto, as listed below:
1020 Amarillo Avenue, Single-family residential
438 Chaucer Street, Single-family residential
419 Palm Street, Single-family residential
1141 Colorado Avenue, Multi-family residential
2023 E. Bayshore Road, Commercial

In order to minimize the flood risk to these properties, the City of Palo Alto annually sends a letter to the property owner of each Repetitive Loss Property educating the owner as to their flood risk and potential actions that they can take to reduce their risk of flood damages. The letter can be found in Palo Alto Attachment 2: Repetitive Loss Letter.

Source: http://quake.abag.ca.gov/mitigation/floodloss/

18.3.4 Resource List:

Documents used in the assembly of this Capability Assessment include: City website, FY11 Proposed Operating Budget, Capital Improvements Budget, Comprehensive Plan, Floodplain Management Ordinance, and Capital Improvements Plan.

18.4 VULNERABILITY ASSESSMENT

18.4.1 Critical Facilities

During the development of this 2011 annex, the City identified numerous critical facilities and provided this list to ABAG in participation with the regional planning process. A summary listing of these facilities is shown in Table 18-12.

Table 18-12: City of Palo Alto Critical Facilities

Facility Name	Address	Critical Function
Montebello Reservoir	1250 Montebello Rd	Potable Water Reservoir
Corte Madera Reservoir	1521 Arastradero Rd	Potable Water Reservoir
Corte Madera Booster St	1521 Arastradero Rd	Potable Water Booster St
Cubberley Comm Ctr	4000 Middlefield	Shelter
Fire Station #4	3600 Middlefield Rd	Fire Station
Adobe Pump Station	1196 East Meadow Dr	Storm Water Pump Station
Park Blvd. Substation	3291 Park Blvd	Electric Substation
Gas Station 2	Alma & Colorado	Natural Gas Station

Facility Name	Address	Critical Function
Colorado Substation	1040 Colorado Ave	Electric Utility
Matadero Pump Station*	1082 Colorado	Storm Water Pump Station
Fire Station #1	301 Alma Street	Fire Station
Quarry Substation	281 Quarry Rd	Electric Substation
City Hall	250 Hamilton Ave	OFFICE
Airport Pump Station	1925 Embarcadero Rd	Storm Water Pump Station
Utility Engineering	1007 Elwell Ct	Recovery
Colorado Pump Station	2999 W Bayshore Rd,	Storm Water Pump Station
Water Quality Control Plant	2501 Embarcadero Way	Regional Wastewater Treatment
Utility Control Center	3241 East Bayshore	Similar to Utility EOC
Gas Station 4	3241 East Bayshore	Natural Gas Station
Municipal Services Ctr	3201 East Bayshore Rd	Recovery
Gas Station 3	1961 Old Page Mill Rd	Natural Gas Station
Fire Station #8	3300 Page Mill Rd	Fire Station (Seasonal)
Quarry Booster Station	1961 Page Mill Rd.	Potable Water Booster St
Park Reservoir	3640 Page Mill Rd	Potable Water Reservoir
Park Booster Station	3640 Page Mill Rd	Potable Water Booster St
Boronda Reservoir	2962 Page Mill Rd	Potable Water Reservoir
Maybell Substation	527 Maybell	Electric Substation
California Turnout	500 California	Potable Water/Fluoride
Hansen Way Substation	950 Hansen Way	Electric Substation
Embarcadero Pump Station	1199 Alma	Storm Water Pump Station
Gas Station 1	1735 Embarcadero	Natural Gas Station
Development Center	285 Hamilton Ave	Recovery
San Francisquito Pump Station*	2027 East Bayshore Road	Storm Water Pump Station
University Pump Station	97 University Ave	Storm Water Pump Station
Sand Hill Turnout	50 El Camino Real	Potable Water/Fluoride
Police Station	275 Forest Ave	PD/EOC/Comm Center
Fire Station #5	600 Arastradero Rd	Fire Station

Facility Name	Address	Critical Function
Arastradero Turnout	694 Arastradero	Potable Water/Fluoride
Mayfield Reservoir	1711 Stanford Ave	Potable Water Reservoir
Mayfield Booster Station	1711 Stanford Ave	Potable Water Booster St
Fire Station #2	2675 Hanover St	Fire Station
Hanover Substation	3350 Hanover	Electric Substation
Dahl Reservoir	3920 Page Mill Rd	Potable Water Reservoir
Dahl Booster Station	3920 Page Mill Rd	Potable Water Booster St
Fire Station #6	711 Sierra St, Stanford Univ	Fire Station
Page Mill Turnout	1899 Page Mill Rd	Potable Water/Fluoride
Boronda Booster Station	3570 Page Mill Rd	Potable Water Booster St
Fire Station #3	799 Embarcadero	Fire Station
Hopkins Substation	1350 Hopkins	Electric Substation
Fire Station #7	2575 Sand Hill Rd. SLAC	Fire Station
Lytton Turnout	315 El Camino Real	Potable Water/Fluoride

This list of critical facilities and available information for them is available digitally in an excel spreadsheet from the City. A complete printing of the critical facilities data is included in Palo Alto Attachment 3: Palo Alto Exposure Analysis.

*These facilities (San Francisquito Creek and Matedero Creek pumping stations) were added to the critical facilities list during final review of this draft and after the completion of the exposure analysis. These facilities should be added to the GIS mapping for inclusion in future exposure analyses and updates to this plan.

18.4.2 Exposure Analysis

Exposure analyses are used to quantify assets which are "exposed" to risk. This is the first step towards understanding the complete value of assets at risk to identified hazards. This section includes an exposure analysis (discussion of assets at risk) for the profiled hazards in Section 4.

Overlay analyses (using GIS) were conducted for the mappable hazards such as wildfire, flood, and the earthquake related hazards. These analyses compare the location of the critical facilities with the mapped hazard area (i.e. floodplains, wildfire threat zones, shaking potential areas, etc.) and result in a listing of which facilities are at most risk to which hazard. Not all hazards are mappable and some hazards, such as drought, are equally likely throughout the entire County. For these hazards, a general exposure summary is presented in Section 18.4.2.1.

18.4.2.1 General Exposure

ABAG's website (http://quake.abag.ca.gov/mitigation/landuse/) presents the results of the regional exposure analysis through a searchable online database. Users can view the summaries of land use and infrastructure exposed to the mappable hazards. This section presents the general summary of land use and infrastructure in the City of Palo Alto. These should be considered at risk to the hazards of equal likelihood throughout the entire County geography (i.e. drought, extreme heat, thunderstorm, etc). Acre totals are rounded.

JURISDICTION: Palo Alto
COUNTY: Santa Clara
HAZARD: Land Use
BASIS: Existing Land Use, 2005 using 2009 hazard mapping

	Total Acres
TOTAL RESIDENTIAL LAND [excluding mixed use]:	**3,952**
1 unit/1-5 acre lot (Rural Residential)	207
1-3 units/acre	826
3-8 units/acre	2,395
>8 units/acre	524
Mobile Home Parks	1
TOTAL MIXED RESIDENTIAL/COMMERCIAL:	**23**
Within a Land Area	0
Within a Building	0
Mixture of Above or Unknown	23
TOTAL MIXED COMMERCIAL/INDUSTRIAL:	**6**
TOTAL INDUSTRIAL [excluding mixed]:	**394**
Light Industrial	50
Heavy Industrial	254
Salvage/Recyling, Mixture or Unknown	61
Food Processing, Warehousing	29
TOTAL MAJOR INFRASTRUCTURE:	**1,683**
Roads, Highway and Related Facilities	1,523
Rail Stations, Yards and Related Facilities	17
Airports	120
Ports	0
Power Facilities	3
Municipal Wastewater Facilities	0

Municipal Water Supply Facilities	0
Communication Facilities	19
Infrastructure--Other, Unknown	0
TOTAL MILITARY:	**3**
Military Residential	0
Military Hospital	3
Military Communications	0
Military Airport or Port	0
General Military	0
Open Military Lands	0
Closed Military Facilities	0
TOTAL COMMERCIAL/SERVICES [excluding mixed]:	**1,552**
Subtotal-Commercial:	1,042
Retail/Wholesale	282
Research/Office	660
Comm. Outdoor Recreation	17
Other, Mixture or Unknown	83
Subtotal-Education:	243
Educational Offices and Day Care	4
Elementary/Secondary	208
Colleges/Universities	28
Stadium Facilities	0
University Housing	0
Day Care Facilities	4
Subtotal-Hospitals and Health Care	177
Trauma Center Hospitals	58
Community or Local Hospitals	117
Surgery Centers	0
State Prisons	0
State Mental Health Facilities	0
Clinics and Long-Term Care	3
Subtotal-Public Institutions:	89
Convention Centers	0
Sports Stadiums	0
Churches/Synagogues/Other	67
City Halls/County Administration	4
Local Jails	0
Local Police/Fire/Emergency	3
Other-Comm. Centers/Libraries	14
	2,237

TOTAL URBAN OPEN:	
Golf Courses	329
Racetracks	0
Campgrounds and Other	41
Cemeteries	72
Parks	1,650
Vacant--Cleared for Redevelopment	0
Vacant--Undeveloped	102
Mixed Urban Open, Including Parks	43
TOTAL AGRICULTURE:	**0**
Cropland and Pasture	0
Orchards/Groves/Vineyards	0
Greenhouses	0
Confined Feeding	0
Farmsteads and Inactive	0
TOTAL RANGELAND:	**3,925**
Herbaceous Range	2,942
Shrub and Brush	109
Mixed Range	875
TOTAL WETLANDS [Based on USGS Mapping]:	**422**
Forested	0
Non-Forested	363
Salt Evaporators	60
Wetlands--Unknown	0
TOTAL FOREST LAND:	**1,049**
Deciduous	51
Evergreen	812
Mixed Forest	186
TOTAL SPARSELY VEGETATED:	**9**
Beaches	0
Other Sand	0
Bare Rock	2
Mines/Quarries	6
Transitional--Landfills	0
Transitional--Other	0
Transitional--Mixture	0

Mixed Sparsely Vegetated	0
	=========
	Total Acres
TOTAL URBAN LAND:	**9,849**
TOTAL NON-URBAN LAND:	**5,406**
GRAND TOTAL:	**15,255**

Source: Association of Bay Area Governments, 2009.

Note: Because of independent rounding, subcategories may not add to totals.

JURISDICTION: Palo Alto
COUNTY: Santa Clara
HAZARD: Land Use
BASIS: Existing Infrastructure, 2009

	Total Miles
ROADS:	**258**
Interstate Highway	5
Primary US/State Highway	10
Secondary State/Co Highway	57
Local Road	169
Misc Ramp/Road	18
TRANSIT:	**4**
Altamont Commuter Express (ACE)	0
Amtrak	0
Bay Area Rapid Transit (BART)	0
Caltrain	4
San Francisco Muni Metro	0
Santa Clara VTA	0
RAIL:	**5**
All Railroads	5
PIPELINES:	**226**
Pipelines Under Roads	226
	=========

Source: Association of Bay Area Governments, 2009.
Miles of pipeline is an approximation based on miles of road within water service area boundaries and does not include major aqueducts.
Miles of pipeline is miles of water pipelines. Miles of sewer pipelines should be approximately the same.

Note: Because of independent rounding, subcategories may not add to totals.

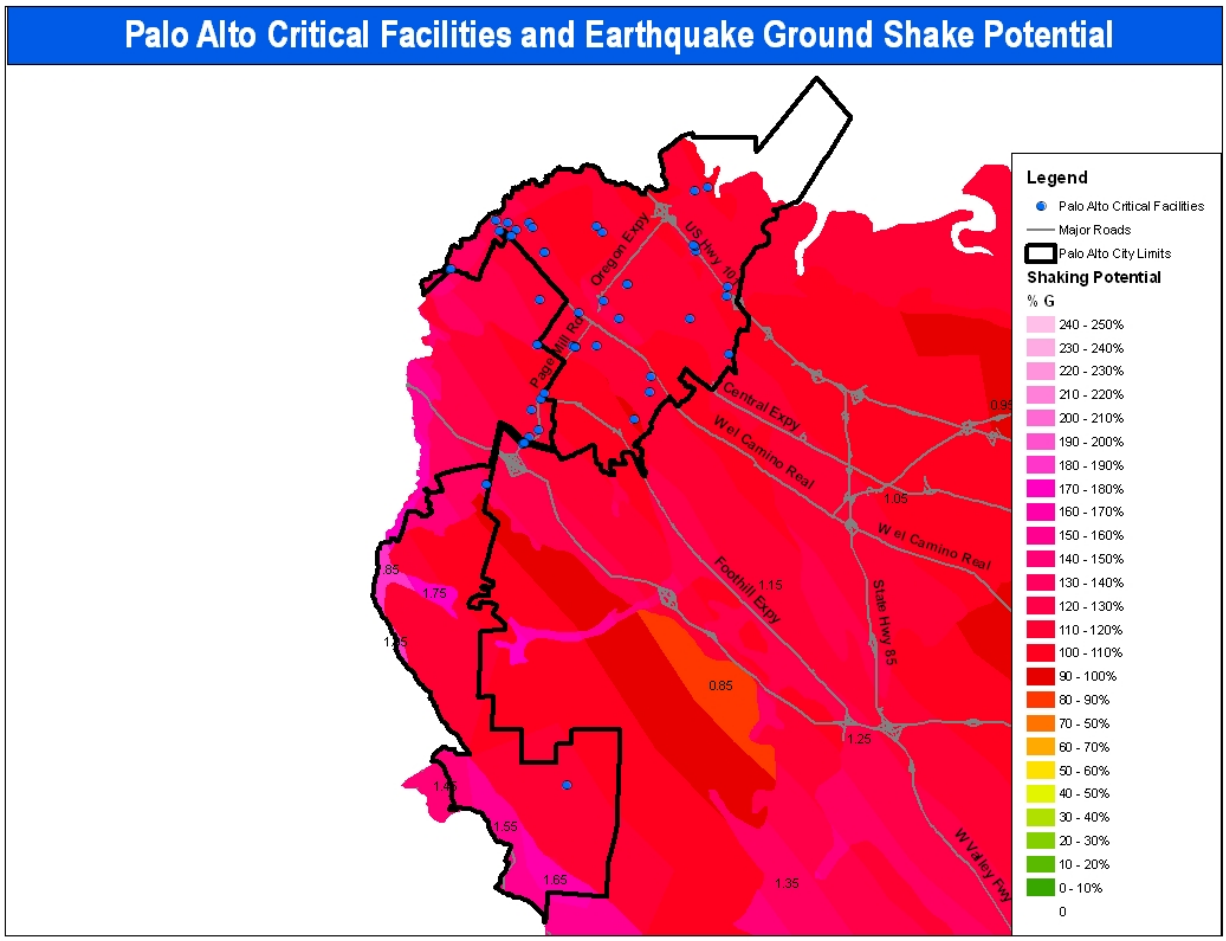
18.4.2.2 Critical Facilities Exposure by Hazard

ABAG's website (http://quake.abag.ca.gov/mitigation/cf2010/) presents the results of the regional facilities exposure analysis through a searchable online database. Users can view the summaries of how many facilities are exposed to the mappable hazards by category: health care facilities, schools, critical facilities, and bridges/interchanges. For the purposes of developing a City specific mitigation strategy, this section identifies which of the City's critical facilities are located in the mapped hazard areas.

The complete results from ABAG's exposure analysis are available digitally in an excel spreadsheet from the City. A complete printing of these results is included in Palo Attachment 3: Palo Alto Exposure Analysis.

18.4.2.2.1 Earthquake Related Hazards

Ground Shaking



Source: CA Department of Conservation

Critical Facility	Peak Acceleration (%G)	Perceived Shaking	Potential Damage	Instrumental Intensity	Bldg Insured Value	Contents Insured Value
Corte Madera Reservoir	135	Extreme	Very Heavy	X+		
Corte Madera Booster St	135	Extreme	Very Heavy	X+		
Fire Station #7	135	Extreme	Very Heavy	X+		
Park Blvd. Substation	125	Extreme	Very Heavy	X+		
Gas Station 2	125	Extreme	Very	X+		

Critical Facility	Peak Acceleration (%G)	Perceived Shaking	Potential Damage	Instrumental Intensity	Bldg Insured Value	Contents Insured Value
			Heavy			
Mayfield Reservoir	125	Extreme	Very Heavy	X+		
Mayfield Booster Station	125	Extreme	Very Heavy	X+		
Lytton Turnout	125	Extreme	Very Heavy	X+		
Montebello Reservoir	115	Violent	Heavy	IX		
Cubberley Comm Ctr	115	Violent	Heavy	IX		
Fire Station #4	115	Violent	Heavy	IX	$369,480	$38,474
San Francisquito Pump Station	115	Violent	Heavy	IX		
Colorado Substation	115	Violent	Heavy	IX		
Matadero Pump Station	115	Violent	Heavy	IX		
Fire Station #1	115	Violent	Heavy	IX	$1,357,268	$137,484
Quarry Substation	115	Violent	Heavy	IX		
Utility Engineering	115	Violent	Heavy	IX		
Colorado Pump Station	115	Violent	Heavy	IX		
Water Quality Control Plant	115	Violent	Heavy	IX		
Utility Control Center	115	Violent	Heavy	IX		
Gas Station 4	115	Violent	Heavy	IX		
Municipal Services Ctr	115	Violent	Heavy	IX	$7,295,081	$1,843,113
Gas Station 3	115	Violent	Heavy	IX		
Fire Station #8	115	Violent	Heavy	IX	$121,279	$19,133
Park Reservoir	115	Violent	Heavy	IX		
Park Booster Station	115	Violent	Heavy	IX		
Boronda	115	Violent	Heavy	IX		

Critical Facility	Peak Acceleration (%G)	Perceived Shaking	Potential Damage	Instrumental Intensity	Bldg Insured Value	Contents Insured Value
Reservoir						
Maybell Substation	115	Violent	Heavy	IX		
California Turnout	115	Violent	Heavy	IX		
Hansen Way Substation	115	Violent	Heavy	IX		
Embarcadero Pump Station	115	Violent	Heavy	IX		
Gas Station 1	115	Violent	Heavy	IX		
Development Center	115	Violent	Heavy	IX		
University Pump Station	115	Violent	Heavy	IX		
Sand Hill Turnout	115	Violent	Heavy	IX		
Police Station	115	Violent	Heavy	IX		
Fire Station #5	115	Violent	Heavy	IX	$434,301	$41,925
Fire Station #2	115	Violent	Heavy	IX	$1,107,290	$107,164
Hanover Substation	115	Violent	Heavy	IX		
Dahl Reservoir	115	Violent	Heavy	IX		
Dahl Booster Station	115	Violent	Heavy	IX		
Fire Station #6	115	Violent	Heavy	IX		
Boronda Booster Station	115	Violent	Heavy	IX		
Adobe Pump Station	105	Violent	Heavy	IX		
Airport Pump Station	105	Violent	Heavy	IX		
Quarry Booster Station	105	Violent	Heavy	IX		
Page Mill Turnout	105	Violent	Heavy	IX		
Fire Station #3	105	Violent	Heavy	IX	$383,804	$39,938
Hopkins Substation	105	Violent	Heavy	IX		

Critical Facility	Peak Acceleration (%G)	Perceived Shaking	Potential Damage	Instrumental Intensity	Bldg Insured Value	Contents Insured Value
Arastradero Turnout	95	Violent	Heavy	IX		

Soft Story Multi-Family Dwellings

In 2003, the Collaborative for Disaster Mitigation at San Jose State University completed an "*Inventory of Soft-First Story Multi-Family Dwellings in Santa Clara County*". At that time, the City of Palo Alto had 130 soft-first story multi-family buildings including 1,263 residential units housing 3,158 occupants. Figure 18-1 below identifies the locations of these buildings. Refer to the City's Comprehensive Plan and building regulations regarding unreinforced masonry buildings.

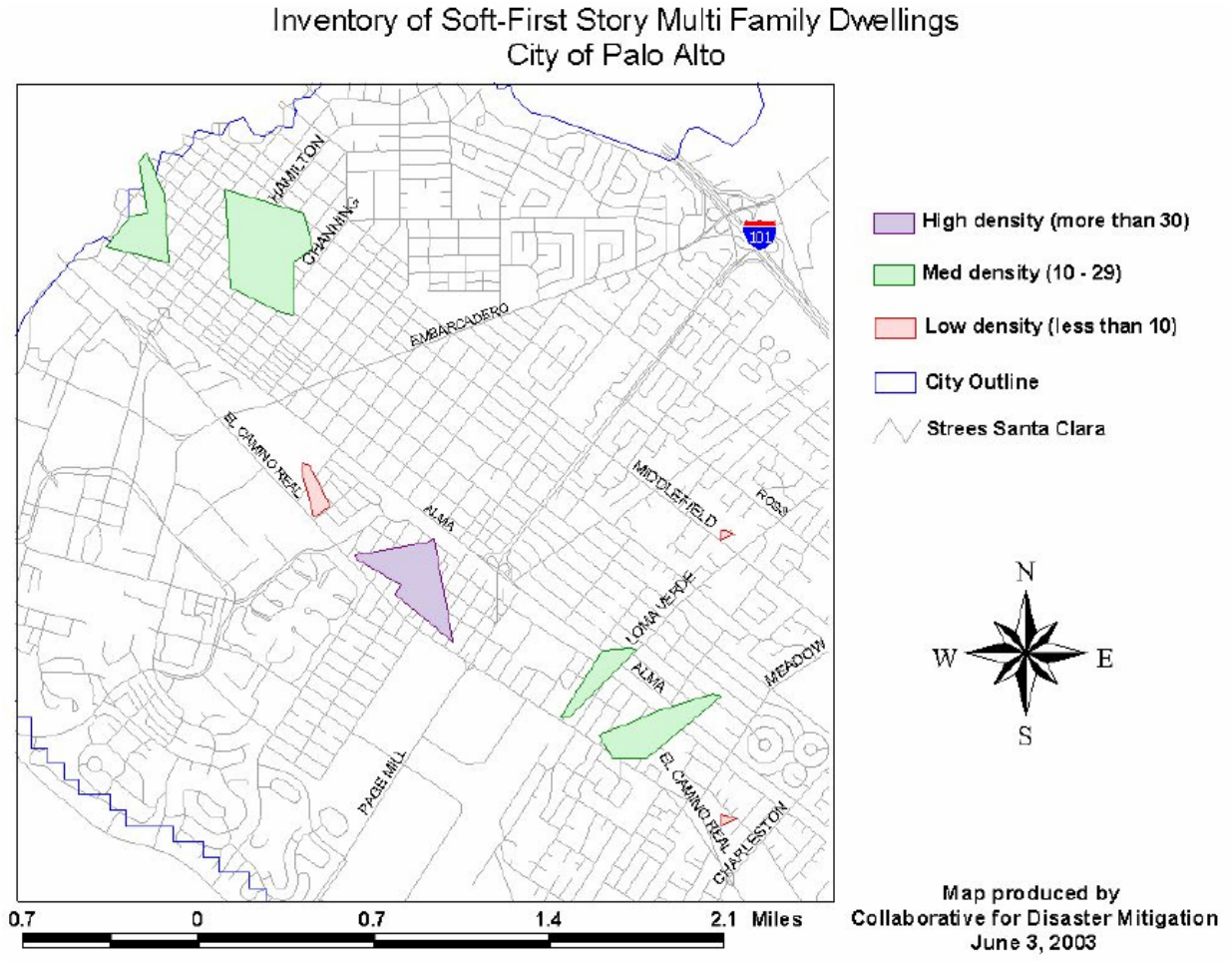


Figure 18-1: Inventory of Soft-First Story Multi-Family Dwellings-City of Palo Alto

Subsequently, the City surveyed soft story structures and developed the following list of addresses:

1851	Alma
3043	Alma
3053	Alma
3065	Alma
3079	Alma
3087-3095	Alma
3297	Alma
3353	Alma
3357	Alma
4157	Byron
4160	Byron
4170	Byron
4171	Byron
4180	Byron
4185	Byron
4190	Byron
720	California
750	California
780	California
122/124/126/128	Channing
460	Channing
634	College
657	College
664	College
811	College
819	College
827	College
725	Cowper
825	Cowper
936	Cowper
220	Curtner Bldg 1 & 2
241	Curtner Bldg 1 & 2
242	Curtner
250	Curtner Bldg 1 & 2
301	Curtner
320	Curtner
322	Curtner
330	Curtner
350	Curtner
380	Curtner Bldg 1 & 2
385	Curtner

391 Curtner

3943 El Camino Real

518 Everett
528 Everett

600-619 Forest
628 Forest
640 Forest
660-666 Forest
668-674 Forest

446-456 Grant
456-464 Grant

630-640 Hamilton

403-407 James
409-419 James
420 James

562 Kendall

630 Los Robles Bldg 1 & 2

559 Matadero

4211 McKellar Bldg 1 & 2
4217 McKellar

801 Middlefield
3903 Middlefield
575 Middlefield
759 Middlefield
3909 Middlefield

570 Oxford

3833 Park
3860 Park
3875 Park

1072 Tanland
1080 Tanland
1090 Tanland
1091 Tanland
1093 Tanland
1094 Tanland

696 Towle

800 University
812 University Bldg 1 & 2
831 University
836 University Bldg 1 & 2

220 Ventura
290 Ventura
310 Ventura
330 Ventura Bldg 1 & 2
382/384/386/388 Ventura
392/394/396/398 Ventura
438 Ventura
443 Ventura

557 Vista Bldg 1 & 2

925 Waverly

355 Webster Bldg 1 & 2
440 Webster
889 Webster

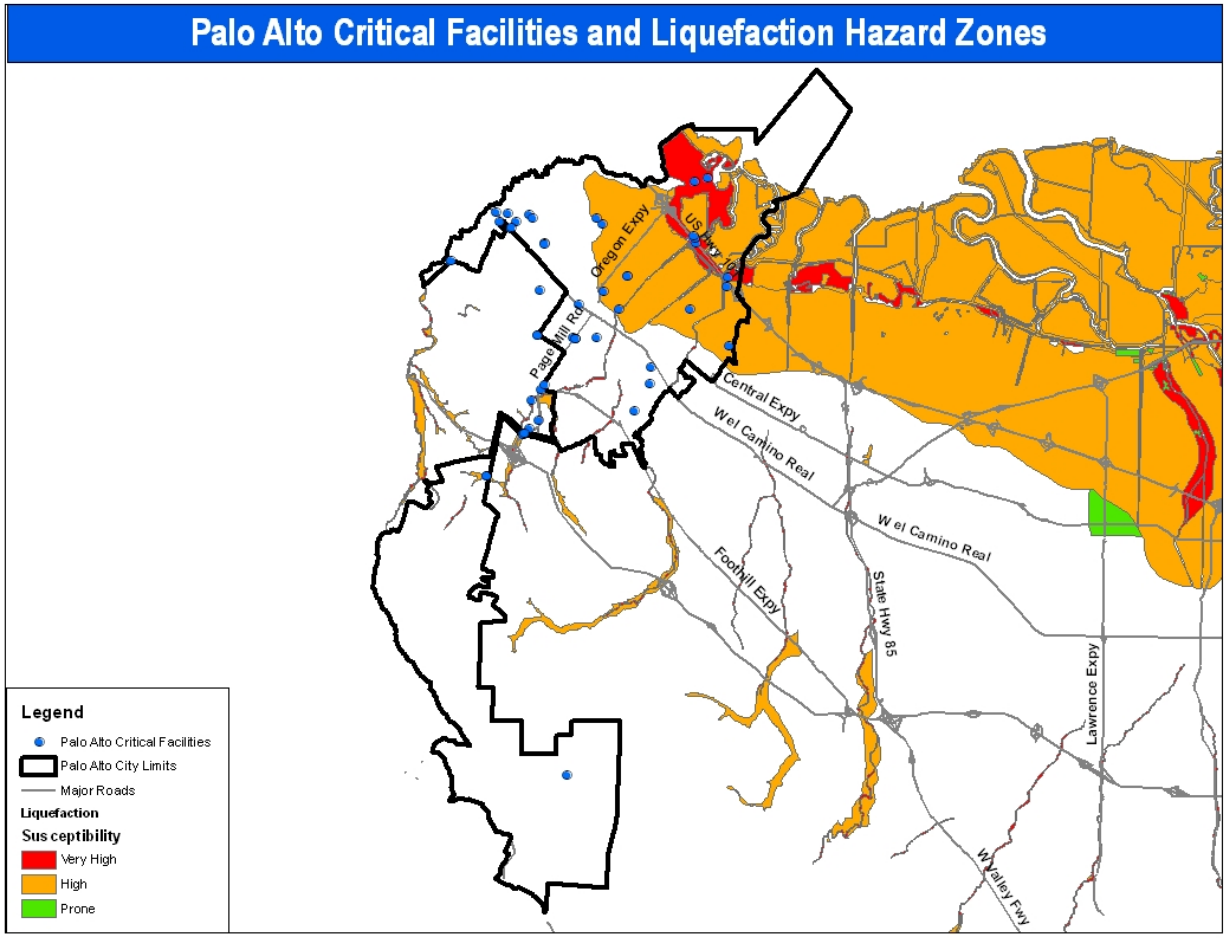
2051 Wellesley Bldg 1 & 2

4290 Wilkie
4292 Wilkie
4292 Wilkie
4296 Wilkie
4298 Wilkie

2134 Williams
2145 Williams
2175 Williams
2259 Williams Bldg 1 & 2

2305 Yale

Earthquake Induced Liquefaction

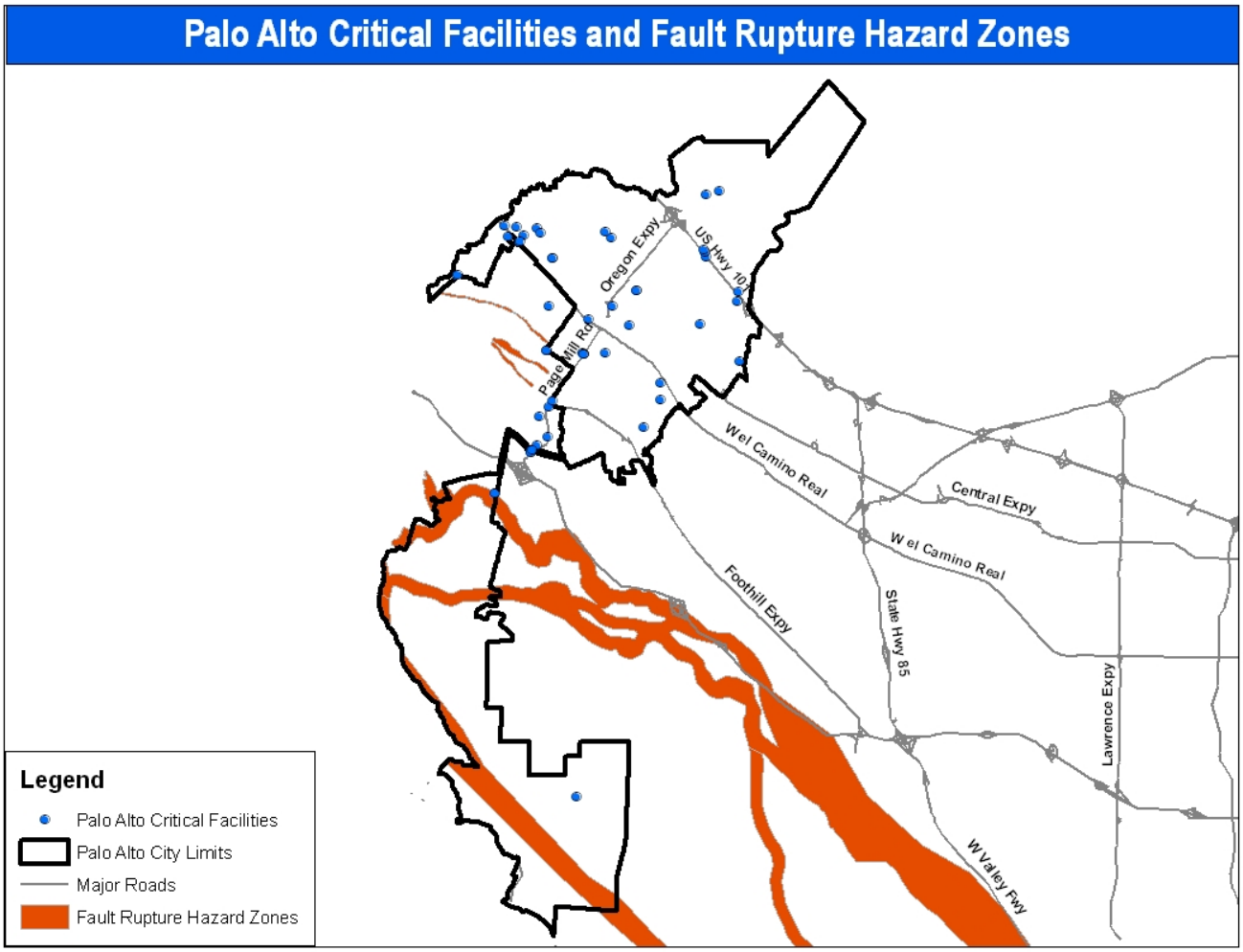


Source: Santa Clara Planning Office

Critical Facility	Liquefaction Hazard Zone	Bldg Insured Value	Contents Insured Value
Airport Pump Station	Very High		
Utility Engineering	Very High		
Colorado Pump Station	Very High		
Water Quality Control Plant	Very High		
Utility Control Center	Very High		
Gas Station 4	Very High		
Municipal Services Ctr	Very High	$7,295,081	$1,843,113
Cubberley Comm Ctr	High		
Fire Station #4	High	$369,480	$38,474
San Francisquito	High		

Critical Facility	Liquefaction Hazard Zone	Bldg Insured Value	Contents Insured Value
Pump Station Adobe Pump Station Matadero Pump Station	High		

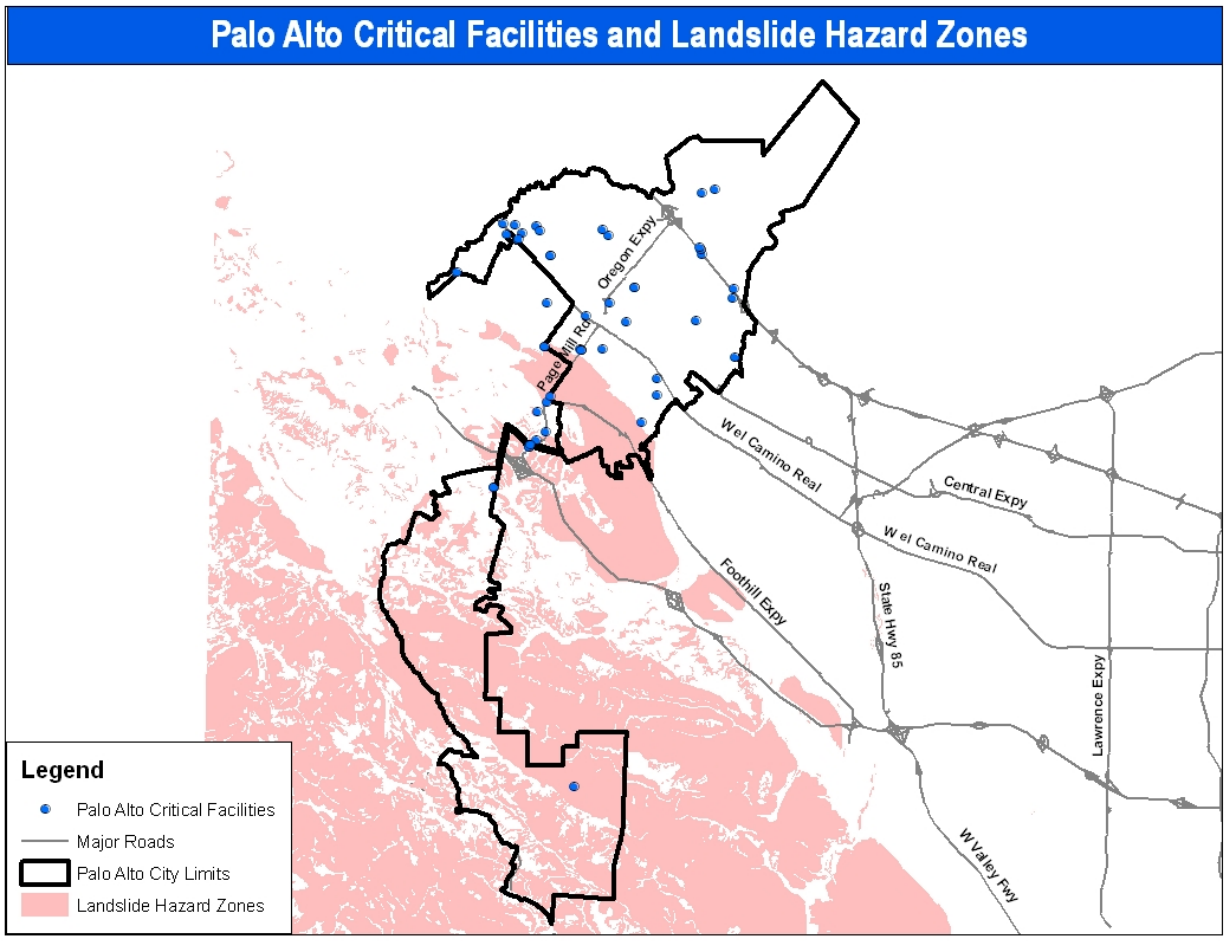
Surface Rupture



Source: CA Geological Survey, State of CA Department of Conservation

There are no critical facilities located in a fault rupture hazard zone in Palo Alto, CA.

Earthquake Induced Landslides



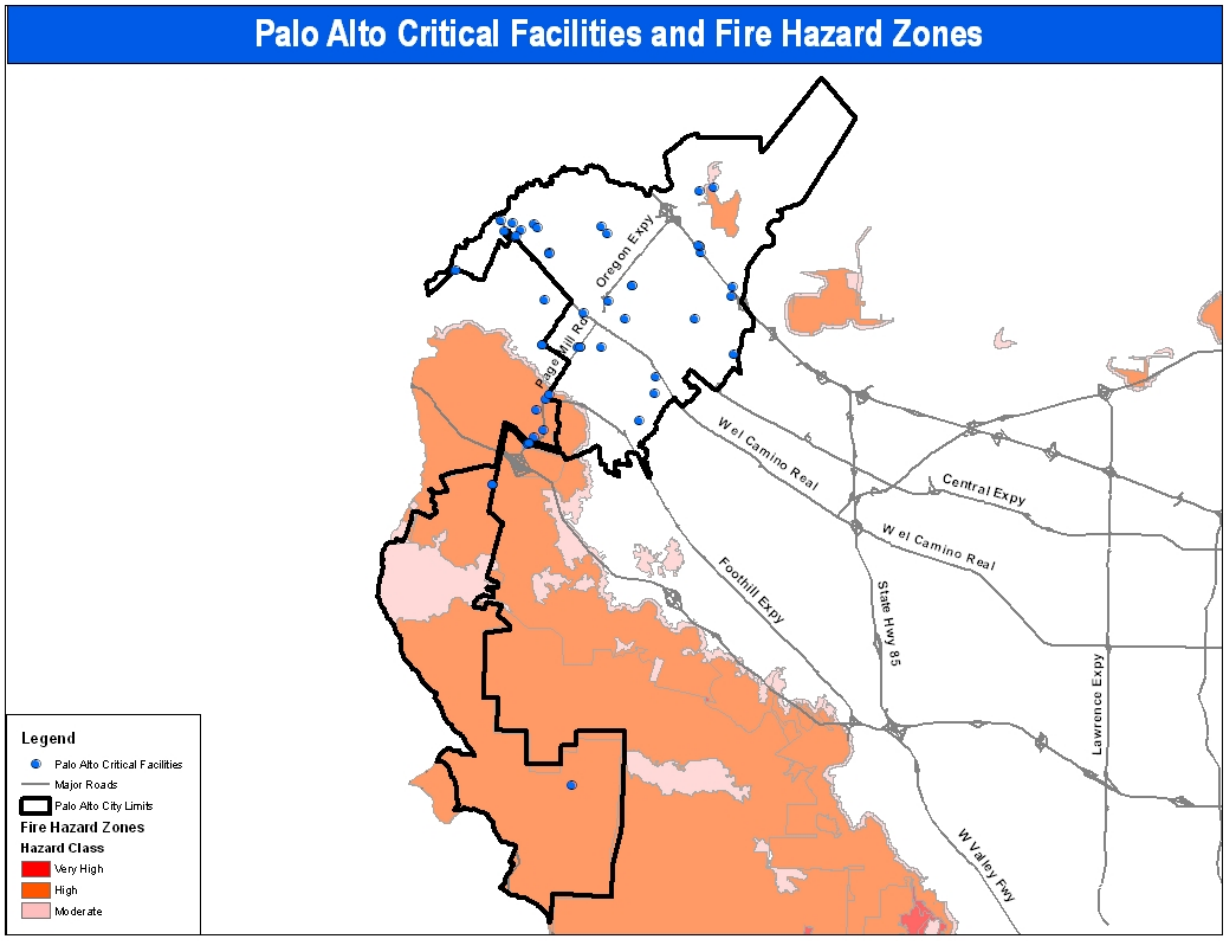
Source: Santa Clara Planning Office, CA State Department of Conservation

Critical Facility	Within Landslide Hazard Zone	Bldg Insured Value	Contents Insured Value
Montebello Reservoir	Yes		
Quarry Booster Station	Yes		
Page Mill Turnout	Yes		

18.4.2.2.2 Infrastructure Failure

Palo Alto does not have any additional unique concerns or vulnerabilities regarding the hazard of infrastructure failure as presented in Section 4.

18.4.2.2.3 Wildfire

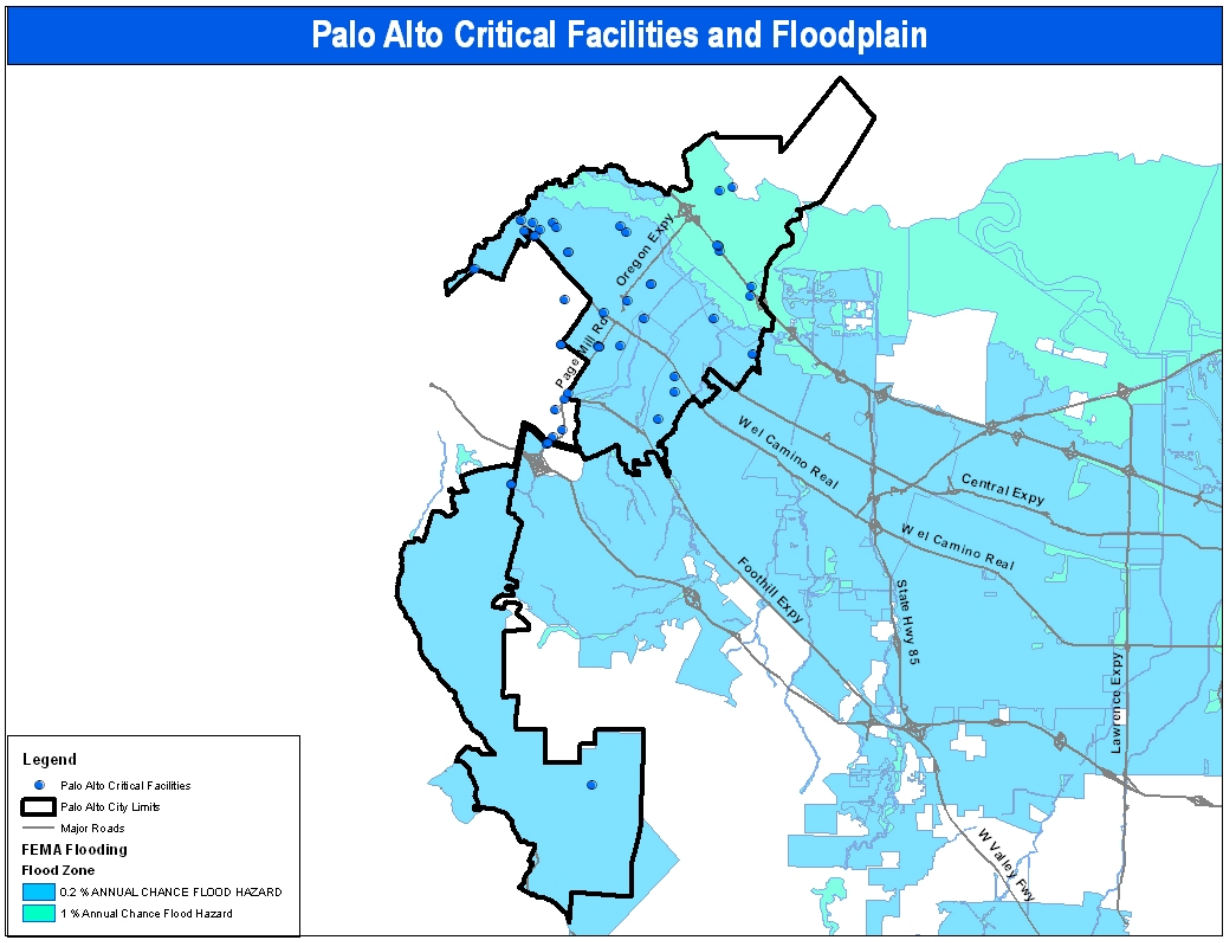


Source: CA Department of Forestry and Fire Protection

Critical Facility	Fire Hazard Zone	Bldg Insured Value	Contents Insured Value
Montebello Reservoir	High		
Corte Madera Reservoir	High		
Corte Madera Booster St	High		
Park Reservoir	High		
Park Booster Station	High		
Boronda Booster Station	High		
Fire Station #8	High	$121,279	$19,133
Boronda Reservoir	High		

Critical Facility	Fire Hazard Zone	Bldg Insured Value	Contents Insured Value
Quarry Booster Station	High		
Page Mill Turnout	High		
Airport Pump Station	High		

18.4.2.2.4 Flooding



Source: FEMA- Santa Clara County DFIRM, 2009

Critical Facility	Flood Zone (% annual chance)	BLDG Insured Value	Contents Insured Value
Adobe Pump Station	1%		
Utility Engineering	1%		
Colorado Pump Station	1%		

Critical Facility	**Flood Zone** (% annual chance)	**BLDG Insured Value**	**Contents Insured Value**
Water Quality Control Plant	1%		
Utility Control Center	1%		
Gas Station 4	1%		
Municipal Services Center	1%	$7,295,081	$1,843,113
Matadero Pump Station	1%		
Airport Pump Station	1%		
San Francisquito Pump Station	1%		
Montebello Reservoir	.2%		
Corte Madera Reservoir	.2%		
Corte Madera Booster St	.2%		
Cubberley Comm Ctr	.2%		
Fire Station #4	.2%	$369,480	$38,474
Park Blvd Substation	.2%		
Gas Station 2	.2%		
Colorado Substation	.2%		
Matadero Pump Station	.2%		
Fire Station #1	.2%	$1,357,268	$137,484
Quarry Substation	.2%		
Maybell Substation	.2%		
California Turnout	.2%		
Hansen Way Substation	.2%		
Embarcadero Pump Station	.2%		
Gas Station 1	.2%		
Development Center	.2%		
University Pump Station	.2%		
Sand Hill Turnout	.2%		
Police Station	.2%		
Fire Station #5	.2%	$434,301	$41,925
Arastradero Turnout	.2%		
Fire Station #2	.2%	$1,107,290	$107,164
Hanover Substation	.2%		
Dahl Reservoir	.2%		
Dahl Booster Station	.2%		
Page Mill Turnout	.2%		
Boronda Booster Station	.2%		

Critical Facility	Flood Zone (% annual chance)	BLDG Insured Value	Contents Insured Value
Fire Station #3	.2%	$383,804	$39,938
Hopkins Substation	.2%		
Fire Station #7	.2%		
Lytton Turnout	.2%		

Sea Level Rise

Several facilities may be impacted by sea level rise as shown in Table 18-13.

Table 18-13: Critical Facilities at risk to Sea Level Rise

Facility Name	Address	16 inch rise	55 inch rise
Adobe Pump Station	1196 East Meadow Dr	X	X
Airport Pump Station	1925 Embarcadero Rd		X
Utility Engineering	1007 Elwell Ct	X	X
Matadero Pump Station	1082 Colorado Ave.	X	X
San Francisquito Pump Station	2027 East Bayshore Rd.	X	X
Colorado Pump Station	2999 W Bayshore Rd,	X	X
Water Quality Control Plant	2501 Embarcadero Way	X	X
Utility Control Center	3241 East Bayshore		X
Gas Station 4	3241 East Bayshore		X
Municipal Services Ctr	3201 East Bayshore Rd		X

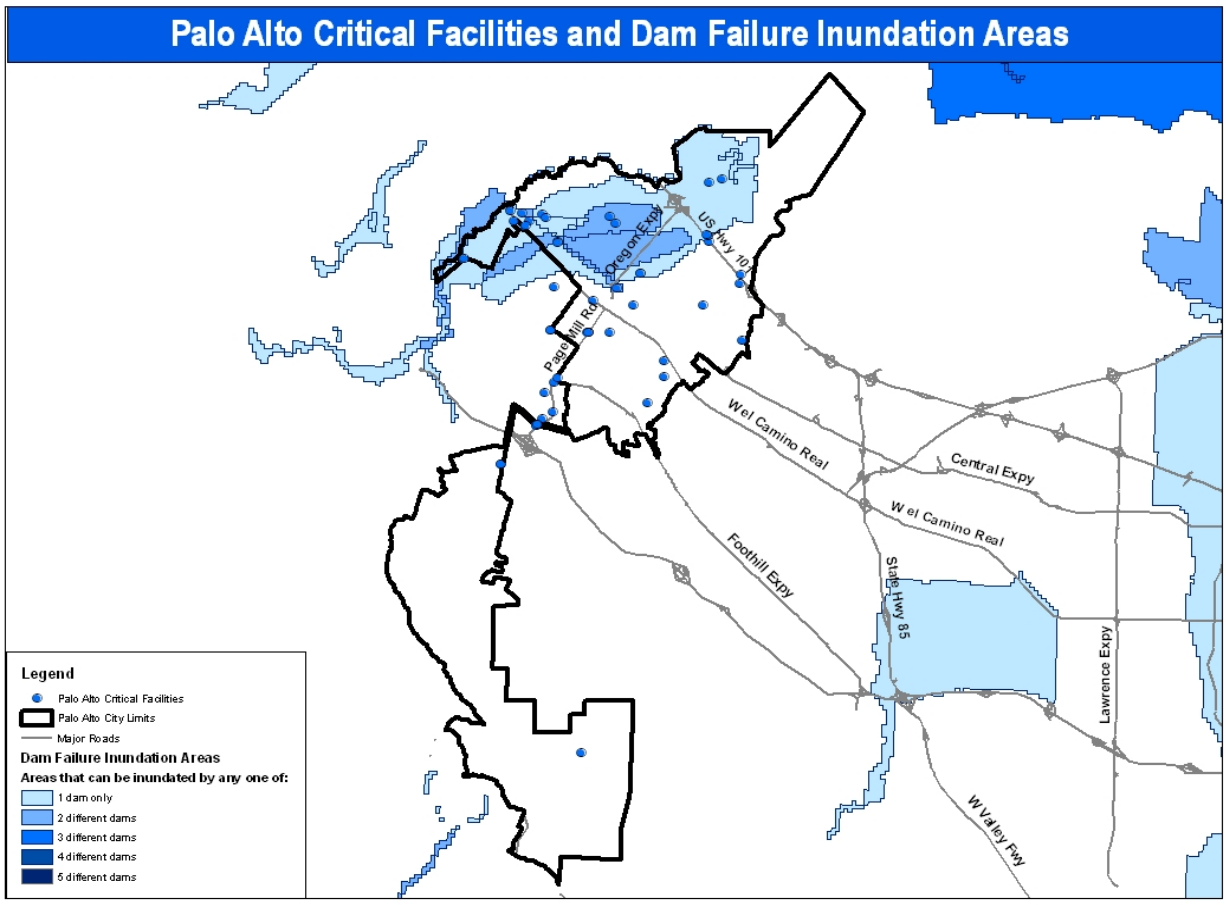
18.4.2.2.5 Drought

All populations, facilities, and assets are equally at risk to impact from drought. The City of Palo Alto does not have any unique concerns regarding the hazard of drought as presented in Section 4.

18.4.2.2.6 Solar Storm

All populations, facilities, and assets are equally at risk to impact from solar storm events. The City of Palo Alto does not have any unique concerns regarding the hazard of solar storm as presented in Section 4.

18.4.2.2.7 Dam Failure



Source: ABAG, 1995. Dam data from State of California Office of Emergency Services

Critical Facility	Dam Failure Inundation Area	Bldg Insured Value	Contents Insured Value
Fire Station #3	2	$383,804	$39,938
Hopkins Substation	2		
Colorado Substation	1		
Colorado Pump Station	1		
Matadero Pump Station	1		
San Francisquito Pump Station	1		
Fire Station #1	1	$1,357,268	$137,484
Quarry Substation	1		
Airport Pump Station	1		

Critical Facility	Dam Failure Inundation Area	Bldg Insured Value	Contents Insured Value
Water Quality Control Plant	1		
Municipal Services Center	1	$7,295,081	$1,843,113
Embarcadero Pump Station	1		
Gas Station 1	1		
Development Center	1		
University Pump Station	1		
Sand Hill Turnout	1		
Police Station	1		
Fire Station #7	1		
Lytton Turnout	1		

18.4.2.2.8 Disease Outbreak

All populations, facilities, and assets are equally at risk to impact from disease outbreak. The City of Palo Alto does not have any unique concerns regarding the hazard of disease outbreak as presented in Section 4.

18.4.2.2.9 Freeze

All populations, facilities, and assets are equally at risk to impact from freeze occurrences. The City of Palo Alto does not have any unique concerns regarding the hazard of freeze as presented in Section 4.

18.4.2.2.10 Wind

All populations, facilities, and assets are equally at risk to impact from high winds. The City of Palo Alto does not have any unique concerns regarding the hazard of wind as presented in Section 4.

18.4.2.2.11 Heat

All populations, facilities, and assets are equally at risk to impact from extreme heat events. The City of Palo Alto does not have any unique concerns regarding the hazard of heat as presented in Section 4.

18.4.2.2.12 Agricultural Pest

The City of Palo Alto does not have any unique concerns regarding the hazard of agricultural pest as presented in Section 4.

18.4.2.2.13 Thunder and Lightning

All populations, facilities, and assets are equally at risk to impact from thunder and lightning events. The City of Palo Alto does not have any unique concerns regarding the hazard of thunder and lightning as presented in Section 4.

18.4.2.2.14 Siltation – Bay Area

The City of Palo Alto has ordinances and an inspection program that require the use of appropriate Best Management Practices (BMPs) (particularly during construction activities) to control the amount of sediment in storm water runoff in order to prevent siltation in local creeks and the Bay. Based upon the effectiveness of these existing ongoing programs, creek/Bay siltation is not a significant issue for the City of Palo Alto.

18.4.2.2.15 Tornado

All populations, facilities, and assets are equally at risk to impact from tornado occurrences. The City of Palo Alto does not have any unique concerns regarding the hazard of tornado as presented in Section 4.

18.4.2.2.16 Hazardous Materials

Hazardous Materials spills are not of particular concern for Critical City Facilities in the City of Palo Alto. In Palo Alto, a limited number of industrial facilities are located in close proximity to residential or other properties with sensitive receptors. This is of particular concern in one portion of the Barron Park residential area adjacent to the Stanford Research Park. The City adopted zoning changes in 2006 to ensure that any new facility with large amounts of hazardous materials maintains appropriate separation from residential or other properties with sensitive receptors. Additional zoning and other regulatory changes are being studied to further enhance the safety of residential and other sensitive sites.

18.4.2.2.17 Landslide and Debris Flow

Landslide and Debris Flow is not of particular concern to the City of Palo Alto.

18.4.2.2.18 Other Hazards

Land Subsidence is not of particular concern to the City of Palo Alto.
Expansive Soils are not of particular concern to the City of Palo Alto.
Hailstorms are not of particular concern to the City of Palo Alto.
Tsunami is not a hazard of concern for the City of Palo Alto.
Volcano eruptions are not a hazard of concern for the City of Palo Alto.

18.5 MITIGATION ACTIONS

18.5.1 Primary Concerns

Based on the exposure analysis, the most critical facilities are exposed to potential ground shaking. Almost all of the critical facilities are at risk to flooding with several in potential dam inundation areas. Several are exposed to liquefaction risk and a few are located in a landslide hazard zone. Several critical facilities are located in a wildfire threat zone.

18.5.2 Mitigation Actions

The City of Palo Alto incorporates by reference herewith the Mitigation Priorities and Actions identified in Chapter 7 and elsewhere in the Santa Clara County LHMP. This section adds some further steps of relevance to the Palo Alto area.

As identified above, the city's essential facilities and infrastructure are at risk. To mitigate the potential loss of the Civic Center (City Hall) complex, which houses the Police Department, the Fire Department, the 911 Dispatch Center, the legacy Emergency Operations Center, and other essential operations, the Palo Alto Police Department acquired and has now deployed a Mobile Emergency Operations Center (MEOC) vehicle, capable of sustaining 911 PSAP, Dispatch, EOC, and other command functions for a sustained period, even with the loss of the Civic Center. However, the need to replace critical infrastructure and facilities, such as the public safety building, remains.

To further and more completely understand the risk to city facilities and the general built infrastructure, the city plans to seek grant funding and other sources of funds to conduct comprehensive, all-hazards risk and vulnerability assessments, including Hazus, through a process known as Threat and Hazard Identification and Risk Assessment (THIRA). The city plans to include crime and terrorism risks (homeland security) in this process, which is consistent with the National Response Framework.

The city plans to seek grant funding and is spending current budget on mitigation measures in the foothills Wildland Urban Interface (WUI), both for fire as well as law enforcement missions.

In any major disaster, communications is always among the top issues discussed in the after action report. The city is beginning work on exploring new off-the-grid (solar powered, etc.) data communications systems and related technologies that would 1) support the continuity of key government functions and 2) would also tie-in community entities (businesses, neighborhoods, NGOs). Augmentation of existing GIS and computer aided dispatch (CAD) systems are also envisioned.

In addition to technological interoperability, the city also is supporting human and organizational cooperation and coordination through some novel structures. For example, the Palo Alto/Stanford Citizen Corps Council (CCC)[2] has been established to represent diverse stakeholders and to ensure each entity has a role to play in all phases of emergency management.

In addition, the city, in partnership with the Palo Alto Neighborhoods (PAN) organization, developed the Block Preparedness Coordinator Program to link each neighborhood with the city's Incident Command System.[3]

Utilities is currently undertaking two initiatives to address threats posed by natural or manmade disasters. To improve the chances of maintaining adequate water supply and ensuring fire fighting capabilities following a major earthquake, the city has added two new wells and will be performing seismic upgrades to its existing reservoirs, rehabilitating 5 existing wells, and is building a new 3.5 million gallon reservoir in El Camino Park.

The City is also negotiating with PG&E and other parties to establish an additional electric transmission feed to the city. Existing connections to the city are vulnerable to being impacted by aircraft from the local airport. The new electric transmission feed will provide an alternate source in case the existing connections are interrupted.

Utilities maintains Emergency Response Plans for its electric, gas, water and wastewater functions. These plans will be implemented in case of an emergency event to mitigate the impacts of the event and to begin the recovery efforts.

The San Francisquito Creek Joint Powers Authority (JPA), which has authority over the San Francisquito Creek, is a government agency formed in 1999 by the cities of Palo Alto, Menlo Park and East Palo Alto, and the Santa Clara Valley Water District and San Mateo County Flood Control District. The JPA, in partnership with the US Army Corps of Engineers, is developing a comprehensive flood control plan for San Francisquito Creek to minimize the risk of flooding. The plan will also identify potential improvements to protect Palo Alto and surrounding communities from the risk of tidal flooding from San Francisco Bay, including the impacts of future sea level rise.

2 www.cityofpaloalto.org/ccc
3 www.paneighborhoods.org/ep

18.6 PLAN MAINTENANCE

18.6.1 Monitoring, evaluating, updating the plan

The City of Palo Alto Office of Emergency Services will be responsible for ensuring that this annex is monitored on an on-going basis. However, the major disasters affecting Palo Alto's community, legal changes, notices from ABAG (as the lead agency in this process), notices from Santa Clara County (lead agency for the County-wide Annex), and other triggers will be used as well.

Finally, the Annex will be a discussion/work item on the City's Emergency Operations Center agenda each year, and department heads and other emergency preparedness staff, who serve in the City's Emergency Operations Center, will focus on evaluating the Annex in light of technological and political changes that may occur during the year or other significant events. This group, in collaboration with Santa Clara County, will be responsible for determining if the plan should be updated.

The City of Palo Alto is committed to reviewing and updating this plan annex at least once every five years, as required by the Disaster Mitigation Act of 2000. The City's OES will contact ABAG four years after this plan is approved to ensure that ABAG plans to undertake the plan update process. If so, the City plans to participate in the multi-jurisdictional plan. If ABAG is unwilling or unable to act as the lead agency in the multi-jurisdictional effort, other agencies will be contacted, including the Santa Clara County Office of Emergency Services. The jurisdictions within Santa Clara County should continue to work together on updating this multi-jurisdictional plan.

The public will continue to be involved whenever the plan is updated and as appropriate during the monitoring and evaluation process. Prior to adoption of updates, the City will provide the opportunity for the public to comment on the updates. A public notice will be published prior to the meeting to announce the comment period and meeting logistics. Moreover, the City will engage stakeholders in community emergency planning through the Palo Alto/Stanford Citizen Corps Council (CCC).

18.6.2 Point of Contact

Comments or suggestions regarding this plan may be submitted at any time to Kenneth Dueker, J.D., Director, Emergency Services: kenneth.dueker@cityofpaloalto.org or 650.617.3100 x1281.

City of Palo Alto: EOC
275 Forest Ave., Palo Alto, CA 94301

18.7 CITY OF PALO ALTO APPENDIX

18.7.1 Palo Alto Attachment 1: Palo Alto Outreach Materials

The City of Palo Alto notified residents and businesses of the hazard mitigation planning process by distributing promotional announcements regarding the public opportunity to respond to the online survey. This attachment includes those outreach materials.

TEXT VERSION

SEARCH FOR:

LIVING IN PALO ALTO 

BUSINESS IN PALO ALTO 

VISITING PALO ALTO 

ENVIRONMENT IN PALO ALTO 

ARTS, PARKS & RECREATION 

KNOW ZONE 

CITY DEPARTMENTS 

EMERGENCY INFORMATION 

This Month in Palo Alto

- Library Advisory Commission Meeting
- 9/80 Friday
- City Council HSR Committee Meeting
- CHSRA Board Meeting
- Household Hazardous Waste Day
- City Council Meeting
- Finance Committee Meeting

[more]

OPEN CITY HALL

3788 people have read what 546 have written on Open City Hall.

READ MORE

Press Releases

- City to Host Two Community Meetings for Input on Remaining Eucalyptus Trees near Children's Play Area at Eleanor Pardee Park
- City to Adjust Development Center Hours to Reinvent Work Processes
- Interim Coordinator Hired to Manage City's Office of Emergency Services
- New "Faces" for Palo Alto's FREE Shuttle Buses to be Unveiled November 22
- Public Cautioned About Robberies

NEWS FOCUS

Meeting on December 1 - Consulting Arborist Evaluates Ten Eucalyptus Trees at Eleanor Pardee Park

Several recommendations are made, including the eventual removal of the remaining ten mature eucalyptus trees.

[more]

City Staff Investigates Tree Trimming by Contractor on California Avenue

Trimming done to remove eye-level branch hazards to pedestrians on the street and sidewalks.

[more]

Change in Hours for Development Center on December 1

Learn more about the Development Center's Blueprint for Enhanced Service

[more]

City Working with Santa Clara County to update Local Hazard Mitigation Plan

Please take a few moments to complete the brief survey at www.surveymonkey.com/s/2010SCCHMP.

[more]

Be Prepared for Winter Storms

There are currently no weather-related emergencies in Palo Alto.

[more]

New "Faces" for Palo Alto's FREE Shuttle Buses Unveiled on November 22

Creative design effort led by former Mayor will promote awareness and ridership.

[more]

December 11 - Holiday photos with Santa Claws!

Make holiday memories with your pet on Saturday, December 11.

(View PDF)

[more]

Update on HSR Activities

Current information about Palo Alto and the High Speed Rail Project.

[more]

November 22 - 24: Expect Traffic Delays on Embarcardero at E. Bayshore

The right turn lane on northbound Embarcadero at East Bayshore will be closed during utility work, 9AM - 4PM.

[more]

Quick Links

Select a Destination

What's New

- BUDGET - Adopted FY 2011
- HIGH SPEED RAIL PROJECT
- Library Facility Projects
- Project Safety Net
- Rail Corridor Task Force
- Stanford Medical Center Project

City Government

- Agendas/Minutes/Reports for Committees/Boards/Commissions
- City Council and Mayor
- CITY COUNCIL MEETINGS - AGENDAS/MINUTES/WEBCASTS
- City Manager's Reports
- City Meetings Schedule
- Comprehensive Plan and Amendment
- Council Priorities/PA "See-It" Site
- Municipal Code
- OPEN CITY HALL
- Phone Directory

Other Resources

- **CREEK MONITOR**
- Employment
- Family Resources
- Foothills Fire Camera at Station 8
- Online Services
- Purchasing/Current Solicitations
- Sign-up Now - AlertSCC for Emergency Notifications

news detail

City Working with Santa Clara County to update Local Hazard Mitigation Plan

The City of Palo Alto is collaborating with Santa Clara County to update our local hazard mitigation plan. This plan outlines mechanisms for increasing our community's resiliency to natural hazard events (earthquake, flood, wildfire, etc.).

Hazard Mitigation is defined as "sustained action taken to reduce or eliminate the long-term risk to human life and property form natural, human-caused, and technological hazards and their effects."

Our Update local hazard mitigation plan will be an annex to the regional plan titled "Taming Natural Disasters: Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area."

Your feedback is critical to increasing local resiliency. Please take a few moments to complete the brief survey at www.surveymonkey.com/s/2010SCCHMP. (The survey will be available online through Friday, December 3, 2010.)

Please encourage your neighbors and friends in Santa Clara County and incorporated cities to complete the brief online survey. If you have any questions regarding the survey or opportunities to participate in the plan update, you may contact Corinne Bartshire at 510-834-3326 or cbartshire@dewberry.com. We sincerely appreciate your time and cooperation in helping our community become more resilient.

Thank you for your participation.

18.7.2 Palo Alto Attachment 2: Repetitive Loss Letter

A letter sent to residents who live in repetitive loss areas that describes ways to mitigate flood and damages to their properties.

December 7, 2010

Name
Address
Palo Alto, CA

Dear:

The City of Palo Alto is participating in the Federal Emergency Management Agency's (FEMA) flood insurance Community Rating System (CRS). The CRS is a program whereby owners of property in a community receive a reduction in flood insurance premiums based on community actions which have the potential to reduce the financial risk of the federal flood insurance program. Based upon the City's participation in the CRS, all holders of flood insurance policies in Palo Alto receive a discount of fifteen percent off the standard premiums, effective October 1, 2001.

One of the community actions required under the CRS program is an evaluation of any properties classified as "repetitive loss" because more than one claim for flood damages has been paid on the property. Your property is one such repetitive loss property within the City of Palo Alto. FEMA has suggested that we contact you to encourage you to take steps to protect the structure from flood damage, such as raising the house so that the lowest floor is above the predicted flood level. As you know from past experiences, flooding poses a genuine threat to your property. If you are interested, a number of government publications describing various flood protection techniques have been placed in the reference section of the Main Library at 1213 Newell Road near Embarcadero Road. Since flood insurance may not cover all of your damages in a flood, you may find it cost-effective to implement some of these protective measures.

You may be interested to know that the Santa Clara Valley Water District maintains a stockpile of filled sandbags for public use during each winter season at a site adjacent to the Palo Alto Airport terminal building at the end of Embarcadero Road. For further information and to receive helpful flood preparedness tips, you may call the District at (408) 265-2600. The City of Palo Alto maintains a stockpile of sand and empty bags at Mitchell Park, 600 E. Meadow Drive. In addition, personnel from the City and the Santa Clara Valley Water District may be available to respond to flooding incidents affecting your property, dependent upon other emergency needs. City maintenance personnel can be reached at 496-6974 (after hours and weekends,

call 329-2413). Santa Clara Valley Water District maintenance personnel can be contacted at (408) 265-2600.

Please find enclosed some Public Works Engineering publications which may be of interest to you. Your property lies within one of the FEMA-designated Special Flood Hazard Areas. We suggest that you take note of the requirements pertaining to Substantial Improvement. If the structure on your property is replaced or substantially improved, the lowest floor will be required to be elevated above the projected base flood elevation.

If you have any questions or need additional information, feel free to call Public Works Engineering at 329-2295.

Sincerely,

Joe Teresi
Senior Engineer
Engineering Division

Enclosures: "Is Your House in a Flood Zone?"
"Special Building Requirements for Residential Structures in a Special Flood Hazard Area"
"Flood Zone Descriptions"
"Things You Should Know About Flood Insurance"

File 47702.9210

18.7.3 Palo Alto Attachment 3: Palo Alto Exposure Analysis

This list includes all information on Palo Alto's critical facilities and identifies which of the City's critical facilities are located in the mapped hazard areas.

ID	Critical Facility	Address	Type	Occupancy	Own/Lease	Structure Type
1	Adobe Pump Station	1196 East Meadow Dr	Storm Water Pump Station	N/A	own	N/A
2	Airport Pump Station	1925 Embarcadero Rd	Storm Water Pump Station	N/A	own	N/A
3	Utility Engineering	1007 Elwell Ct	Recovery	N/A	lease	PC1 (TU)
4	Colorado Pump Station	2999 W Bayshore Rd,	Storm Water Pump Station	N/A	own	N/A
5	Water Quality Control Plant	2501 Embarcadero	Regional Plant	N/A	own	WTP
6	Utility Control Center	3241 East Bayshore	Similar to Utility EOC	N/A	own	Wood-frame building > 5,000 SQFT
7	Gas Station 4	3241 East Bayshore	Natural Gas Station	N/A	N/A	N/A
8	Municipal Services Ctr	3201 East Bayshore Rd	Recovery	N/A	own	PC1 (TU)
9	Montebello Reservoir	1250 Montebello Rd	Potable Water Reservoir	N/A	N/A	N/A
10	Corte Madera Reservoir	1521 Arastradero Rd	Potable Water Reservoir	N/A	N/A	N/A
11	Corte Madera Booster St	1521 Arastradero Rd	Potable Water Booster St	N/A	N/A	N/A
12	Cubberley Comm Ctr	4000 Middlefield	Shelter	N/A	lease	RM2
13	Fire Station #4	3600 Middlefield Rd	Fire Station	N/A	own	Light wood-frame building <= 5,000 SQFT
14	Park Blvd. Substation	3291 Park Blvd	Electric Substation	N/A	own	Substation
15	Gas Station 2	Alma & Colorado	Natural Gas Station	N/A	N/A	N/A
16	Colorado Distribution	1040 Colorado Ave	Electric Utility	N/A	own	N/A
17	Matadero Pump Station	1082 Colorado	Storm Water Pump Station	N/A	own	N/A
18	Fire Station #1	301 Alma Street	Fire Station	N/A	own	RM2
19	Quarry Substation	281 Quarry Rd	Electric Substation	N/A	own	Substation
20	City Hall	250 Hamilton Ave	OFFICE	N/A	own	C1
21	Gas Station 3	1961 Old Page Mill Rd	Natural Gas Station	N/A	N/A	N/A
22	Fire Station #8	3300 Page Mill Rd	Fire Station (Seasonal)	N/A	own	Light wood-frame building <= 5,000 SQFT
23	Quarry Booster Station	1961 Page Mill Rd.	Potable Water Booster St	N/A	N/A	N/A
24	Park Reservoir	3640 Page Mill Rd	Potable Water Reservoir	N/A	N/A	N/A
25	Park Booster Station	3640 Page Mill Rd	Potable Water Booster St	N/A	N/A	N/A
26	Boronda Reservoir	2962 Page Mill Rd	Potable Water Reservoir	N/A	N/A	N/A
27	Maybell Substation	527 Maybell	Electric Substation	N/A	own	Substation
28	California Turnout	500 California	Potable Water/Fluoride	N/A	N/A	N/A
29	Hansen Way Substation	950 Hansen Way	Electric Substation	N/A	own	Substation
30	Embarcadero Pump Station	1199 Alma	Storm Water Pump Station	N/A	own	N/A
31	Gas Station 1	1735 Embarcadero	Natural Gas Station	N/A	N/A	N/A
32	Development Center	285 Hamilton Ave	Recovery	N/A	lease	C1
33	University Pump Station	97 University Ave	Storm Water Pump Station	N/A	own	N/A
34	Sand Hill Turnout	50 El Camino Real	Potable Water/Fluoride	N/A	N/A	N/A
35	Police Station	275 Forest Ave	PD/EOC/Comm Center	N/A	own	C1
36	Fire Station #5	600 Arastradero Rd	Fire Station	N/A	own	Light wood-frame building <= 5,000 SQFT
37	Arastradero Turnout	694 Arastradero	Potable Water/Fluoride	N/A	N/A	N/A
38	Mayfield Reservoir	1711 Stanford Ave	Potable Water Reservoir	N/A	N/A	N/A
39	Mayfield Booster Station	1711 Stanford Ave	Potable Water Booster St	N/A	N/A	N/A
40	Fire Station #2	2675 Hanover St	Fire Station	N/A	own	RM2
41	Hanover Substation	3350 Hanover	Electric Substation	N/A	own	Substation
42	Dahl Reservoir	3920 Page Mill Rd	Potable Water Reservoir	N/A	N/A	N/A
43	Dahl Booster Station	3920 Page Mill Rd	Potable Water Booster St	N/A	N/A	N/A

ID	Critical Facility	Address	Type	Occupancy	Own/Lease	Structure Type
44	Fire Station #6	711 Sierra St, Stanford Univ	Fire Station	N/A	own	N/A
45	Page Mill Turnout	1899 Page Mill Rd	Potable Water/Fluoride	N/A	N/A	N/A
46	Boronda Booster Station	3570 Page Mill Rd	Potable Water Booster St	N/A	N/A	N/A
47	Fire Station #3	799 Embarcadero	Fire Station	N/A	own	Light wood-frame building <= 5,000 SQFT
48	Hopkins Substation	1350 Hopkins	Electric Substation	N/A	own	Substation
49	Fire Station #7	2575 Sand Hill Rd. SLAC	Fire Station	N/A	own	N/A
50	Lytton Turnout	315 El Camino Real	Potable Water/Fluoride	N/A	N/A	N/A

ID	Critical Facility	Structure Information	Irregularities- Plan View	Irregularities- Vertical	Structural Assessment	Retrofit
1	Adobe Pump Station	N/A	N/A	N/A	N/A	N/A
2	Airport Pump Station	N/A	N/A	N/A	N/A	N/A
3	Utility Engineering	N/A	N/A	No	N/A	N/A
4	Colorado Pump Station	N/A	N/A	N/A	N/A	N/A
5	Water Quality Control Plant	N/A	N/A	N/A	N/A	N/A
6	Utility Control Center	N/A	No	No	N/A	N/A
7	Gas Station 4	N/A	N/A	N/A	N/A	N/A
8	Municipal Services Ctr	N/A	N/A	N/A	N/A	Added exterior bracing
9	Montebello Reservoir	N/A	N/A	N/A	N/A	N/A
10	Corte Madera Reservoir	N/A	N/A	N/A	N/A	N/A
11	Corte Madera Booster St	N/A	N/A	N/A	N/A	N/A
12	Cubberley Comm Ctr	N/A	N/A	N/A	N/A	N/A
13	Fire Station #4	N/A	No	N/A	Scheduled for Replacement	N/A
14	Park Blvd. Substation	N/A	N/A	N/A	N/A	N/A
15	Gas Station 2	N/A	N/A	N/A	N/A	N/A
16	Colorado Distribution	N/A	N/A	N/A	N/A	N/A
17	Matadero Pump Station	N/A	N/A	N/A	N/A	N/A
18	Fire Station #1	N/A	N/A	N/A	N/A	N/A
19	Quarry Substation	N/A	N/A	N/A	N/A	N/A
20	City Hall	N/A	High Rise	No	N/A	Added shear walls & steel bracing
21	Gas Station 3	N/A	N/A	N/A	N/A	N/A
22	Fire Station #8	N/A	No	N/A	N/A	N/A
23	Quarry Booster Station	N/A	N/A	N/A	N/A	N/A
24	Park Reservoir	N/A	N/A	N/A	N/A	N/A
25	Park Booster Station	N/A	N/A	N/A	N/A	N/A
26	Boronda Reservoir	N/A	N/A	N/A	N/A	N/A
27	Maybell Substation	N/A	N/A	N/A	N/A	N/A
28	California Turnout	N/A	N/A	N/A	N/A	N/A
29	Hansen Way Substation	N/A	N/A	N/A	N/A	N/A
30	Embarcadero Pump Station	N/A	N/A	N/A	N/A	N/A
31	Gas Station 1	N/A	N/A	N/A	N/A	N/A
32	Development Center	N/A	Soft Story	N/A	N/A	N/A
33	University Pump Station	N/A	N/A	N/A	N/A	N/A

ID	Critical Facility	Structure Information	Irregularities- Plan View	Irregularities- Vertical	Structural Assessment	Retrofit
34	Sand Hill Turnout	N/A	N/A	N/A	N/A	N/A
35	Police Station	Attached to Council Chamber	N/A	No	N/A	Added shear walls & steel bracing
36	Fire Station #5	N/A	No	N/A	N/A	N/A
37	Arastradero Turnout	N/A	N/A	N/A	N/A	N/A
38	Mayfield Reservoir	N/A	N/A	N/A	N/A	N/A
39	Mayfield Booster Station	N/A	N/A	N/A	N/A	N/A
40	Fire Station #2	N/A	No	N/A	N/A	N/A
41	Hanover Substation	N/A	N/A	N/A	N/A	N/A
42	Dahl Reservoir	N/A	N/A	N/A	N/A	N/A
43	Dahl Booster Station	N/A	N/A	N/A	N/A	N/A
44	Fire Station #6	N/A	N/A	N/A	N/A	N/A
45	Page Mill Turnout	N/A	N/A	N/A	N/A	N/A
46	Boronda Booster Station	N/A	N/A	N/A	N/A	N/A
47	Fire Station #3	N/A	No	N/A	Scheduled for Replacement	N/A
48	Hopkins Substation	N/A	N/A	N/A	N/A	N/A
49	Fire Station #7	N/A	N/A	N/A	N/A	N/A
50	Lytton Turnout	N/A	N/A	N/A	N/A	N/A

ID	Critical Facility	Anchored Equipment	Alternate Power	Sprinklers	Roof Material	Year Built
1	Adobe Pump Station	N/A	N/A	N/A	N/A	N/A
2	Airport Pump Station	N/A	N/A	N/A	N/A	N/A
3	Utility Engineering	N/A	N/A	N/A	N/A	N/A
4	Colorado Pump Station	N/A	N/A	N/A	N/A	N/A
5	Water Quality Control Plant	N/A	N/A	N/A	N/A	N/A
6	Utility Control Center	no	yes	yes	Tar/gravel	1987
7	Gas Station 4	N/A	N/A	N/A	N/A	N/A
8	Municipal Services Ctr	no	yes	yes	Tar	1966
9	Montebello Reservoir	N/A	N/A	N/A	N/A	N/A
10	Corte Madera Reservoir	N/A	N/A	N/A	N/A	N/A
11	Corte Madera Booster St	N/A	N/A	N/A	N/A	N/A
12	Cubberley Comm Ctr	N/A	no	N/A	N/A	N/A
13	Fire Station #4	no	yes	no	Wood Shingle	1954
14	Park Blvd. Substation	N/A	N/A	N/A	N/A	N/A
15	Gas Station 2	N/A	N/A	N/A	N/A	N/A
16	Colorado Distribution	N/A	N/A	N/A	N/A	N/A
17	Matadero Pump Station	N/A	N/A	N/A	N/A	N/A
18	Fire Station #1	no	yes	no	Tar	1965
19	Quarry Substation	N/A	N/A	N/A	N/A	N/A
20	City Hall	yes	yes	yes	tar	1970
21	Gas Station 3	N/A	N/A	N/A	N/A	N/A

ID	Critical Facility	Anchored Equipment	Alternate Power	Sprinklers	Roof Material	Year Built
22	Fire Station #8	no	no	yes	Asphalt Shingle	1986
23	Quarry Booster Station	N/A	N/A	N/A	N/A	N/A
24	Park Reservoir	N/A	N/A	N/A	N/A	N/A
25	Park Booster Station	N/A	N/A	N/A	N/A	N/A
26	Boronda Reservoir	N/A	N/A	N/A	N/A	N/A
27	Maybell Substation	N/A	N/A	N/A	N/A	N/A
28	California Turnout	N/A	N/A	N/A	N/A	N/A
29	Hansen Way Substation	N/A	N/A	N/A	N/A	N/A
30	Embarcadero Pump Station	N/A	N/A	N/A	N/A	N/A
31	Gas Station 1	N/A	N/A	N/A	N/A	N/A
32	Development Center	N/A	N/A	N/A	Tar	N/A
33	University Pump Station	N/A	N/A	N/A	N/A	N/A
34	Sand Hill Turnout	N/A	N/A	N/A	N/A	N/A
35	Police Station	yes	yes	yes	tar	1970
36	Fire Station #5	no	yes	no	Tar	1962
37	Arastradero Turnout	N/A	N/A	N/A	N/A	N/A
38	Mayfield Reservoir	N/A	N/A	N/A	N/A	N/A
39	Mayfield Booster Station	N/A	N/A	N/A	N/A	N/A
40	Fire Station #2	no	yes	no	Tar	1965
41	Hanover Substation	N/A	N/A	N/A	N/A	N/A
42	Dahl Reservoir	N/A	N/A	N/A	N/A	N/A
43	Dahl Booster Station	N/A	N/A	N/A	N/A	N/A
44	Fire Station #6	N/A	N/A	N/A	N/A	N/A
45	Page Mill Turnout	N/A	N/A	N/A	N/A	N/A
46	Boronda Booster Station	N/A	N/A	N/A	N/A	N/A
47	Fire Station #3	no	yes	no	Tar	1942
48	Hopkins Substation	N/A	N/A	N/A	N/A	N/A
49	Fire Station #7	N/A	N/A	N/A	N/A	N/A
50	Lytton Turnout	N/A	N/A	N/A	N/A	N/A

ID	Critical Facility	Stories	Capacity	Bldg Insured Value	Contents Insured Value	
1	Adobe Pump Station	N/A	N/A	N/A	N/A	
2	Airport Pump Station	N/A	N/A	N/A	N/A	
3	Utility Engineering	N/A	N/A	N/A	N/A	
4	Colorado Pump Station	N/A	N/A	N/A	N/A	
5	Water Quality Control Plant	N/A	N/A	N/A	N/A	
6	Utility Control Center	1	5488	N/A	N/A	
7	Gas Station 4	N/A	N/A	N/A	N/A	
8	Municipal Services Ctr	N/A	71097	7295081	1843113	
9	Montebello Reservoir	N/A	N/A	N/A	N/A	
10	Corte Madera Reservoir	N/A	N/A	N/A	N/A	

ID	Critical Facility	Stories	Capacity	Bldg Insured Value	Contents Insured Value	
11	Corte Madera Booster St	N/A	N/A	N/A	N/A	
12	Cubberley Comm Ctr	N/A	N/A	N/A	N/A	
13	Fire Station #4	1	2659	369480	38474	
14	Park Blvd. Substation	N/A	N/A	N/A	N/A	
15	Gas Station 2	N/A	N/A	N/A	N/A	
16	Colorado Distribution	N/A	N/A	N/A	N/A	
17	Matadero Pump Station	N/A	N/A	N/A	N/A	
18	Fire Station #1	2	13800	1357268	137484	
19	Quarry Substation	N/A	N/A	N/A	N/A	
20	City Hall	N/A	356401	58861650	8942789	
21	Gas Station 3	N/A	N/A	N/A	N/A	
22	Fire Station #8	1	1451	121279	19133	
23	Quarry Booster Station	N/A	N/A	N/A	N/A	
24	Park Reservoir	N/A	N/A	N/A	N/A	
25	Park Booster Station	N/A	N/A	N/A	N/A	
26	Boronda Reservoir	N/A	N/A	N/A	N/A	
27	Maybell Substation	N/A	N/A	N/A	N/A	
28	California Turnout	N/A	N/A	N/A	N/A	
29	Hansen Way Substation	N/A	N/A	N/A	N/A	
30	Embarcadero Pump Station	N/A	N/A	N/A	N/A	
31	Gas Station 1	N/A	N/A	N/A	N/A	
32	Development Center	N/A	N/A	N/A	N/A	
33	University Pump Station	N/A	N/A	N/A	N/A	
34	Sand Hill Turnout	N/A	N/A	N/A	N/A	
35	Police Station	N/A	N/A	N/A	N/A	
36	Fire Station #5	1	3666	434301	41925	
37	Arastradero Turnout	N/A	N/A	N/A	N/A	
38	Mayfield Reservoir	N/A	N/A	N/A	N/A	
39	Mayfield Booster Station	N/A	N/A	N/A	N/A	
40	Fire Station #2	1	8131	1107290	107164	
41	Hanover Substation	N/A	N/A	N/A	N/A	
42	Dahl Reservoir	N/A	N/A	N/A	N/A	
43	Dahl Booster Station	N/A	N/A	N/A	N/A	
44	Fire Station #6	2	N/A	N/A	N/A	
45	Page Mill Turnout	N/A	N/A	N/A	N/A	
46	Boronda Booster Station	N/A	N/A	N/A	N/A	
47	Fire Station #3	1	3032	383804	39938	
48	Hopkins Substation	N/A	N/A	N/A	N/A	
49	Fire Station #7	N/A	N/A	N/A	N/A	
50	Lytton Turnout	N/A	N/A	N/A	N/A	

ID	Critical Facility	# of Dams	Wildland-Urban Interface (WUI) Fire Threat	Wildfire Threat	FEMA Flood Zone	Tsunami
1	Adobe Pump Station	0	Fire-threatened area	Moderate	100 Year	Not Affected
2	Airport Pump Station	1	Outside WUI hazard area	Moderate	100 Year with Velocity Hazard (wave action)	Not Affected
3	Utility Engineering	0	Outside WUI hazard area	Moderate	100 Year	Not Affected
4	Colorado Pump Station	0	Outside WUI hazard area	Moderate	100 Year	Not Affected
5	Water Quality Control Plant	1	Fire-threatened area	Moderate	100 Year	Not Affected
6	Utility Control Center	0	Outside WUI hazard area	Moderate	100 Year	Not Affected
7	Gas Station 4	0	Outside WUI hazard area	Moderate	100 Year	Not Affected
8	Municipal Services Ctr	1	Outside WUI hazard area	Moderate	100 Year	Not Affected
9	Montebello Reservoir	0	Outside WUI hazard area	Little/No	500 Year	Not Affected
10	Corte Madera Reservoir	0	Fire-threatened area	High	500 Year	Not Affected
11	Corte Madera Booster St	0	Fire-threatened area	High	500 Year	Not Affected
12	Cubberley Comm Ctr	0	Outside WUI hazard area	Moderate	500 Year	Not Affected
13	Fire Station #4	0	Outside WUI hazard area	Moderate	500 Year	Not Affected
14	Park Blvd. Substation	0	Outside WUI hazard area	Moderate	500 Year	Not Affected
15	Gas Station 2	0	Outside WUI hazard area	Moderate	500 Year	Not Affected
16	Colorado Distribution	1	Outside WUI hazard area	Moderate	500 Year	Not Affected
17	Matadero Pump Station	1	Outside WUI hazard area	Moderate	500 Year	Not Affected
18	Fire Station #1	1	Fire-threatened area	Moderate	500 Year	Not Affected
19	Quarry Substation	1	Fire-threatened area	Moderate	500 Year	Not Affected
20	City Hall	0	Outside WUI hazard area	Moderate	100 Year	Not Affected
21	Gas Station 3	0	Outside WUI hazard area	High	Undetermined	Not Affected
22	Fire Station #8	0	Outside WUI hazard area	Moderate	Undetermined	Not Affected
23	Quarry Booster Station	0	Outside WUI hazard area	Moderate	Undetermined	Not Affected
24	Park Reservoir	0	Outside WUI hazard area	Moderate	Undetermined	Not Affected
25	Park Booster Station	0	Outside WUI hazard area	Moderate	Undetermined	Not Affected
26	Boronda Reservoir	0	Outside WUI hazard area	Moderate	Undetermined	Not Affected
27	Maybell Substation	0	Outside WUI hazard area	Moderate	500 Year	Not Affected
28	California Turnout	0	Outside WUI hazard area	Moderate	500 Year	Not Affected
29	Hansen Way Substation	0	Fire-threatened area	Moderate	500 Year	Not Affected
30	Embarcadero Pump Station	1	Fire-threatened area	Moderate	500 Year	Not Affected
31	Gas Station 1	1	Fire-threatened area	Moderate	500 Year	Not Affected
32	Development Center	1	Fire-threatened area	Moderate	500 Year	Not Affected
33	University Pump Station	1	Fire-threatened area	Moderate	500 Year	Not Affected
34	Sand Hill Turnout	1	Fire-threatened area	Moderate	500 Year	Not Affected
35	Police Station	1	Fire-threatened area	Moderate	500 Year	Not Affected
36	Fire Station #5	0	Outside WUI hazard area	Moderate	500 Year	Not Affected
37	Arastradero Turnout	0	Fire-threatened area	Moderate	500 Year	Not Affected
38	Mayfield Reservoir	0	Outside WUI hazard area	Moderate	Undetermined	Not Affected
39	Mayfield Booster Station	0	Outside WUI hazard area	Moderate	Undetermined	Not Affected

ID	Critical Facility	# of Dams	Wildland-Urban Interface (WUI) Fire Threat	Wildfire Threat	FEMA Flood Zone	Tsunami
40	Fire Station #2	0	Fire-threatened area	Moderate	500 Year	Not Affected
41	Hanover Substation	0	Fire-threatened area	Moderate	500 Year	Not Affected
42	Dahl Reservoir	0	Fire-threatened area	Moderate	500 Year	Not Affected
43	Dahl Booster Station	0	Fire-threatened area	Moderate	500 Year	Not Affected
44	Fire Station #6	0	Fire-threatened area	Moderate	Undetermined	Not Affected
45	Page Mill Turnout	0	Outside WUI hazard area	Moderate	500 Year	Not Affected
46	Boronda Booster Station	0	Outside WUI hazard area	Moderate	500 Year	Not Affected
47	Fire Station #3	2	Fire-threatened area	Moderate	500 Year	Not Affected
48	Hopkins Substation	2	Fire-threatened area	Moderate	500 Year	Not Affected
49	Fire Station #7	1	Fire-threatened area	Moderate	500 Year	Not Affected
50	Lytton Turnout	1	Fire-threatened area	Moderate	500 Year	Not Affected

ID	Critical Facility	Existing Landslide Areas	EQ-Induced Landslide	EQ Shake Potential	Liquefaction Susceptibility	EQ-Induced Liquefaction
1	Adobe Pump Station	Surficial Deposits	Outside of CGS Landslide Zone	55	Moderate	Liquefaction Hazard Zone
2	Airport Pump Station	Surficial Deposits	Outside of CGS Landslide Zone	75	Moderate	Liquefaction Hazard Zone
3	Utility Engineering	Surficial Deposits	Outside of CGS Landslide Zone	75	Very High	Liquefaction Hazard Zone
4	Colorado Pump Station	Surficial Deposits	Outside of CGS Landslide Zone	75	Very High	Liquefaction Hazard Zone
5	Water Quality Control Plant	Surficial Deposits	Outside of CGS Landslide Zone	75	Very High	Liquefaction Hazard Zone
6	Utility Control Center	Surficial Deposits	Outside of CGS Landslide Zone	75	Very High	Liquefaction Hazard Zone
7	Gas Station 4	Surficial Deposits	Outside of CGS Landslide Zone	75	Very High	Liquefaction Hazard Zone
8	Municipal Services Ctr	Surficial Deposits	Outside of CGS Landslide Zone	75	Very High	Liquefaction Hazard Zone
9	Montebello Reservoir	Few Landslides	Outside of CGS Landslide Zone	75	Very Low	Outside of CGS Liquefaction Zone
10	Corte Madera Reservoir	Few Landslides	Outside of CGS Landslide Zone	75	Very Low	Outside of CGS Liquefaction Zone
11	Corte Madera Booster St	Few Landslides	Outside of CGS Landslide Zone	75	Very Low	Outside of CGS Liquefaction Zone
12	Cubberley Comm Ctr	Surficial Deposits	Outside of CGS Landslide Zone	55	Moderate	Liquefaction Hazard Zone
13	Fire Station #4	Surficial Deposits	Outside of CGS Landslide Zone	55	Moderate	Liquefaction Hazard Zone
14	Park Blvd. Substation	Surficial Deposits	Outside of CGS Landslide Zone	55	Moderate	Liquefaction Hazard Zone
15	Gas Station 2	Surficial Deposits	Outside of CGS Landslide Zone	55	Moderate	Liquefaction Hazard Zone
16	Colorado Distribution	Surficial Deposits	Outside of CGS Landslide Zone	55	Moderate	Liquefaction Hazard Zone
17	Matadero Pump Station	Surficial Deposits	Outside of CGS Landslide Zone	55	Moderate	Liquefaction Hazard Zone
18	Fire Station #1	Surficial Deposits	Outside of CGS Landslide Zone	55	Moderate	Liquefaction Hazard Zone
19	Quarry Substation	Surficial Deposits	Outside of CGS Landslide Zone	55	Moderate	Liquefaction Hazard Zone
20	City Hall	Surficial Deposits	Mapping in Progress	85	Moderate	Mapping in Progress
21	Gas Station 3	Few Landslides	Outside of CGS Landslide Zone	65	Very Low	Outside of CGS Liquefaction Zone
22	Fire Station #8	Few Landslides	Outside of CGS Landslide Zone	65	Very Low	Outside of CGS Liquefaction Zone
23	Quarry Booster Station	Few Landslides	Outside of CGS Landslide Zone	65	Very Low	Outside of CGS Liquefaction Zone
24	Park Reservoir	Surficial Deposits	Outside of CGS Landslide Zone	65	Very Low	Outside of CGS Liquefaction Zone
25	Park Booster Station	Surficial Deposits	Outside of CGS Landslide Zone	65	Very Low	Outside of CGS Liquefaction Zone
26	Boronda Reservoir	Mostly Landslide Area	Outside of CGS Landslide Zone	65	Very Low	Outside of CGS Liquefaction Zone
27	Maybell Substation	Surficial Deposits	Outside of CGS Landslide Zone	65	Moderate	Outside of CGS Liquefaction Zone
28	California Turnout	Surficial Deposits	Outside of CGS Landslide Zone	65	Moderate	Outside of CGS Liquefaction Zone
29	Hansen Way Substation	Surficial Deposits	Outside of CGS Landslide Zone	65	Moderate	Outside of CGS Liquefaction Zone

ID	Critical Facility	Existing Landslide Areas	EQ-Induced Landslide	EQ Shake Potential	Liquefaction Susceptibility	EQ-Induced Liquefaction
30	Embarcadero Pump Station	Surficial Deposits	Outside of CGS Landslide Zone	65	Moderate	Outside of CGS Liquefaction Zone
31	Gas Station 1	Surficial Deposits	Outside of CGS Landslide Zone	65	Moderate	Outside of CGS Liquefaction Zone
32	Development Center	Surficial Deposits	Outside of CGS Landslide Zone	65	Moderate	Outside of CGS Liquefaction Zone
33	University Pump Station	Surficial Deposits	Outside of CGS Landslide Zone	65	Moderate	Outside of CGS Liquefaction Zone
34	Sand Hill Turnout	Surficial Deposits	Outside of CGS Landslide Zone	65	Moderate	Outside of CGS Liquefaction Zone
35	Police Station	Surficial Deposits	Outside of CGS Landslide Zone	65	Moderate	Outside of CGS Liquefaction Zone
36	Fire Station #5	Surficial Deposits	Outside of CGS Landslide Zone	65	Low	Outside of CGS Liquefaction Zone
37	Arastradero Turnout	Surficial Deposits	Outside of CGS Landslide Zone	65	Low	Outside of CGS Liquefaction Zone
38	Mayfield Reservoir	Surficial Deposits	Outside of CGS Landslide Zone	65	Low	Outside of CGS Liquefaction Zone
39	Mayfield Booster Station	Surficial Deposits	Outside of CGS Landslide Zone	65	Low	Outside of CGS Liquefaction Zone
40	Fire Station #2	Few Landslides	Outside of CGS Landslide Zone	65	Low	Outside of CGS Liquefaction Zone
41	Hanover Substation	Few Landslides	Outside of CGS Landslide Zone	65	Low	Outside of CGS Liquefaction Zone
42	Dahl Reservoir	Few Landslides	Outside of CGS Landslide Zone	65	Low	Outside of CGS Liquefaction Zone
43	Dahl Booster Station	Few Landslides	Outside of CGS Landslide Zone	65	Low	Outside of CGS Liquefaction Zone
44	Fire Station #6	Surficial Deposits	Outside of CGS Landslide Zone	65	Low	Outside of CGS Liquefaction Zone
45	Page Mill Turnout	Few Landslides	Outside of CGS Landslide Zone	65	Low	Outside of CGS Liquefaction Zone
46	Boronda Booster Station	Surficial Deposits	Outside of CGS Landslide Zone	65	Very Low	Outside of CGS Liquefaction Zone
47	Fire Station #3	Surficial Deposits	Outside of CGS Landslide Zone	65	Moderate	Liquefaction Hazard Zone
48	Hopkins Substation	Surficial Deposits	Outside of CGS Landslide Zone	65	Moderate	Liquefaction Hazard Zone
49	Fire Station #7	Surficial Deposits	Outside of CGS Landslide Zone	75	Very High	Liquefaction Hazard Zone
50	Lytton Turnout	Surficial Deposits	Outside of CGS Landslide Zone	55	Very High	Liquefaction Hazard Zone

ID	Critical Facility	Sea Level Risk 16"	Sea Level Rise 55"			
1	Adobe Pump Station	Affected	Affected			
2	Airport Pump Station	Not Affected	Affected			
3	Utility Engineering	Affected	Affected			
4	Colorado Pump Station	Affected	Affected			
5	Water Quality Control Plant	Affected	Affected			
6	Utility Control Center	Not Affected	Affected			
7	Gas Station 4	Not Affected	Affected			
8	Municipal Services Ctr	Not Affected	Affected			
9	Montebello Reservoir	Not Affected	Not Affected			
10	Corte Madera Reservoir	Not Affected	Not Affected			
11	Corte Madera Booster St	Not Affected	Not Affected			
12	Cubberley Comm Ctr	Not Affected	Not Affected			
13	Fire Station #4	Not Affected	Not Affected			
14	Park Blvd. Substation	Not Affected	Not Affected			
15	Gas Station 2	Not Affected	Not Affected			
16	Colorado Distribution	Not Affected	Not Affected			
17	Matadero Pump Station	Not Affected	Not Affected			
18	Fire Station #1	Not Affected	Not Affected			
19	Quarry Substation	Not Affected	Not Affected			
20	City Hall	Not Affected	Not Affected			

ID	Critical Facility	Sea Level Risk 16"	Sea Level Rise 55"			
21	Gas Station 3	Not Affected	Not Affected			
22	Fire Station #8	Not Affected	Not Affected			
23	Quarry Booster Station	Not Affected	Not Affected			
24	Park Reservoir	Not Affected	Not Affected			
25	Park Booster Station	Not Affected	Not Affected			
26	Boronda Reservoir	Not Affected	Not Affected			
27	Maybell Substation	Not Affected	Not Affected			
28	California Turnout	Not Affected	Not Affected			
29	Hansen Way Substation	Not Affected	Not Affected			
30	Embarcadero Pump Station	Not Affected	Not Affected			
31	Gas Station 1	Not Affected	Not Affected			
32	Development Center	Not Affected	Not Affected			
33	University Pump Station	Not Affected	Not Affected			
34	Sand Hill Turnout	Not Affected	Not Affected			
35	Police Station	Not Affected	Not Affected			
36	Fire Station #5	Not Affected	Not Affected			
37	Arastradero Turnout	Not Affected	Not Affected			
38	Mayfield Reservoir	Not Affected	Not Affected			
39	Mayfield Booster Station	Not Affected	Not Affected			
40	Fire Station #2	Not Affected	Not Affected			
41	Hanover Substation	Not Affected	Not Affected			
42	Dahl Reservoir	Not Affected	Not Affected			
43	Dahl Booster Station	Not Affected	Not Affected			
44	Fire Station #6	Not Affected	Not Affected			
45	Page Mill Turnout	Not Affected	Not Affected			
46	Boronda Booster Station	Not Affected	Not Affected			
47	Fire Station #3	Not Affected	Not Affected			
48	Hopkins Substation	Not Affected	Not Affected			
49	Fire Station #7	Not Affected	Not Affected			
50	Lytton Turnout	Not Affected	Not Affected			