

Annex to 2010 Association of Bay
Area Governments
Local Hazard Mitigation Plan
Taming Natural Disasters



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Introduction

This Local Hazard Mitigation Plan is to be an amendment to the City's *Safety Element* of the General Plan. It serves as an annex to the Association of Bay Area Governments (ABAG) multi-jurisdictional Local Hazard Mitigation Plan. ABAG's website explains Hazard Mitigation as:

Hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. Hazard mitigation is most effective when a long-term plan is developed before a disaster occurs. A hazard mitigation plan identifies the hazards a community or region faces, assesses their vulnerability to the hazards and identifies specific actions that can be taken to reduce the risk from the hazards. The Federal Disaster Mitigation Act of 2000 (DMA 2000) outlines a process which cities, counties, and special districts can follow to develop a Local Hazard Mitigation Plan. Development of this plan is a requirement for certain benefits from CalEMA and FEMA.

To assist local governments in meeting this requirement, ABAG is the lead agency on the multi-jurisdictional Local Hazard Mitigation Plan (MJ-LHMP) for the San Francisco Bay Area. Cities and counties can adopt and use all or part of this multi-jurisdictional plan in lieu of preparing all or part of a Local Hazard Mitigation Plan themselves. However, they need to have participated in the development of the multi-jurisdictional plan to adopt it. The plan was originally adopted in 2005. The 2010 plan has been adopted by ABAG and local jurisdictions are in the process of updating their annexes.¹

City Geography and Background

Founded in 1852, the City of Oakland (City) is located on the eastern shore of the San Francisco Bay. In 2010, Oakland's population was 390,724². Oakland is the third-largest city in the Bay Area, after San Jose and San Francisco, and the eighth-largest city in California³. Oakland is the county seat of Alameda County.

The city has a total area of 78 mi² (202 km²): 56 mi² (145 km²) or 72% of it is land, and 22 mi² (57 km²) or 28% of it is water. The City's elevation is 42 feet above sea level. The city is bordered on the north by the cities of Berkeley and Emeryville and to the south by the city of San Leandro. To the west and across the estuary channel is the city of Alameda and to the east, Contra Costa County. Oakland is the only city in the United States with a natural saltwater lake wholly contained within its border (115-acre Lake Merritt).

¹ See ABAG's website, <http://quake.abag.ca.gov/mitigation/>

² U. S. Census Bureau (2010), *Redistricting Data (Public Law 94-171) Summary File*, Table P1

³ CA Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State, 2010-2011

City of Oakland
Annex to Local Hazard Mitigation Plan

Oakland is located in the north of Alameda County



The City is one of the most ethnically diverse places in the United States—a City with a population that is 28% African American, 25% Hispanic, and 17% Asian.⁴

In 2010-2011, the City's budget was approximately \$440 million. The City employs 3,800 full-time people. The City provides local police services and local fire services. In addition, the Fire Services Agency receives \$1.85 million annually in revenues from the Oakland Wildfire Prevention Assessment District.

The Port of Oakland, began in 1927, operates the Port and Oakland International Airport, and also owns additional waterfront property that it leases as commercial real estate. The Port Board consists of seven members nominated by the Mayor and appointed by the City Council. The Port employs 465 people and has an operating budget for FY 2010-2011 of \$258 million.⁵

The Regional Planning Process

The City of Oakland participated in various ABAG workshops, conferences, and meetings during the development of the multi-jurisdictional Local Hazard Mitigation Plan, including:

- 2008-9 ABAG Regional Planning Committee meetings
- 2008 "Sewer Smart" Summit
- ABAG Executive Board meeting (regular attendance)
- Staff attendance at 2009 ABAG Housing and Outreach Committee meetings
- ABAG Lifeline and Hazard Review Committee standing meetings
- Various City/County Workshops
- Commitment letter on file with ABAG on May 21, 2009
- Provided critical facilities data on June 30, 2009
- Strategies worksheet prepared September 30, 2009
- Long Term Recovery planning meetings (ABAG)

⁴ U. S. Census Bureau (2010), *Redistricting Data (Public Law 94-171) Summary File*, Table P1

⁵ Port of Oakland, "2010 - 2011 Adopted Operating and Capital Budgets," www.portofoakland.com/pdf/2010_pbs_03.pdf

For more information on these meetings and for rosters of attendees, please see Appendix A and H in the ABAG Multi-Jurisdictional Local Hazard Mitigation Plan 2010 (MJ-LHMP).⁶ In addition, the City of Oakland has provided written and oral comments on the multi-jurisdictional plan and provided information on facilities that are defined as “critical” to ABAG.

The Local Planning Process

Preparing the 2010 Oakland annex to the multi-jurisdictional Local Hazard Mitigation Plan is a continuation of a planning process that has been in place since the early 1970s with the adoption of the City’s first Seismic and Safety elements to the City’s General Plan. The City of Oakland is a leader in the regional discussion of hazards, hazards mitigation and disaster recovery. For example, Oakland Councilmember Nancy Nadel continues to serve as chair of the ABAG Earthquake and Hazards Outreach Review Committee.

Participating senior staff in the 2010 MJ LHMP update of Oakland priorities were:

- Renee Domingo, Manager of the Oakland Fire Department’s Office of Emergency Services, with support from her staff;
- Leroy Griffin, Assistant Fire Marshall, Oakland Fire Department
- Eric Angstadt, Deputy Director of the Oakland Community and Economic Development Agency, and his staff
- Ray Derania, Oakland Building Official, and his staff

Office of Emergency Services regularly participates in a wide variety of federal, state, regional and local groups, task forces and workshops on disaster preparation and recovery. See Exhibit A to this Annex for a list of meetings where City of Oakland management and staff have participated.

In 2004, the City’s *Safety Element* to its General Plan was updated, and includes a discussion of:

- public safety: including violent crime and terrorism;
- geologic hazards: including earthquake fault displacement, ground shaking, liquefaction, subsidence and settlement, slope instability or landslide hazards, erosion, soils, structural hazards, transportation facilities, and utility systems;
- fire hazards: including fire-fighting response, water supply, structural fires, wildland fires, roadway standards and emergency routes;
- hazardous materials: including business plan program, CalARP program, UST program, aboveground storage tank program, hazardous waste tiered permitting program, household hazardous water management, toxic air contaminants, contaminated sites and brownfields, transportation, pipelines, emergency response, and zoning;

⁶ See ABAG’s website, <http://quake.abag.ca.gov/mitigation>.

- flooding hazards: including storm-induced flooding, tsunamis, seiches, dam failure, and sea-level rise.

In addition to the policies and actions outlined in the *Safety Element*, the City routinely enforces the requirements of the California Environmental Quality Act (CEQA); since 1988, CEQA requires mitigation for identified natural hazards. Additional hazard mitigation policies from the *Housing Element* and the *Land Use and Transportation Element* of the General Plan also protect residents and businesses in Oakland. The City has been a model of disaster mitigation planning, and was designated one of the first Disaster Resistant Communities in the United States.

The City's preparation of this 2010 Annex to the MJ LHMP focused on reviewing these pre-existing programs and strategies, identifying any gaps that may lead to disaster vulnerabilities, in order to work on ways to address these risks through mitigation. This effort has been minimal because of Oakland's close collaboration with ABAG in its preparation of the 2010 MJ LHMP for the region.

The City adopted a Soft Story survey by ordinance (12966 C.M.S.) in July, 2009. The new ordinance mandates that owners of certain residential buildings provide simple and low-cost information to the City about their building's ground-floor structural supports (dimensions, materials, photographs, floor plan). It does not require any type of structural retrofit. To promote participation in the program, the City sent certified letters to owners of record to approximately 1,500 apartment buildings of 5 or more units that had been previously identified as potentially having soft stories (large open spaces on the ground floor). The Building Official and other staff also made a presentation to the Rental Housing Association of Northern Alameda County (RHANAC) at their annual workshop and information fair, and ran an article in their newsletter; RHANAC also sent letters to their members.

To encourage homeowners to complete life- and property-saving retrofits, City Council approved Oakland Municipal Code Chapter 15.30.050, which incorporated basic retrofit standards into the City's Municipal Code and established a flat retrofit permit fee of \$250. Currently, any homeowner of a one- to-two story, single family or duplex residence who desires to retrofit for seismic safety is eligible for the \$250 flat retrofit permit fee, provided the retrofit plan meets the current seismic strengthening standards.

For owner-occupied, low-income households, the City's Redevelopment Agency offers Seismic Safety Incentive Program grants for the completion of seismic retrofit repairs.⁷

In addition to these two earthquake hazards mitigation programs, Oakland Emergency Services staff still participate in the quarterly Emergency Management Board meetings to coordinate with local stakeholders; as well as ABAG's Lifelines Infrastructure and Hazards Review Committee.

⁷ This program is administered by Lloyd Ware of the City's Housing and Community Development section.

The resolution adopting this annex to ABAG's multi-jurisdictional LHMP is expected to be on the City Council agenda in March of 2012. Additionally, all of the mitigation strategies identified in this 2010 Annex will be integrated into those contained in the City's *Safety Element* of the General Plan, as an "implementation annex" to the *Safety Element*. This action requires a resolution of the City Council, and will be based on a recommendation from the Oakland Planning Commission.

The City of Oakland has made strides in comprehensive emergency management planning through the development of the federal and state compliant Local Hazard Mitigation Plan (LHMP), Emergency Operations Plan (EOP) and Regional Catastrophic Preparedness Grant Program (RCPGP) Annexes. The LHMP assists in the mitigation of future disasters by identifying risk vulnerabilities and measures to alleviate the impact of hazards. The EOP is an all-hazards emergency preparedness, response and short-term recovery plan designed to: serve as a basis for effective response to any hazard threatening Oakland using capabilities for the protection of citizens from the effects of disasters; facilitate the integration of mitigation in response and recovery activities; and facilitate coordination with cooperating private or volunteer organizations and County, State and Federal government in disaster situations. The RCPGP Annexes are specialized addendums to the EOP which focus on the City's response to the impact of a catastrophic earthquake on mass care and sheltering, mass transportation and evacuation, donations management, volunteer management, mass fatalities, and debris management.

Each emergency plan follows the principles and processes outline in the National Incident Management System (SEMS), California Standardized Emergency Management System (SEMS), and the Incident Command System (ICS). This provides a consistent, flexible and adjustable framework for the City to work to manage disasters regardless of their cause, size, location or complexity across all phases of emergency management: preparedness, response, recovery and mitigation.

Public Meetings

Residents and interested parties will have an opportunity to review this Annex, and the City's priorities for mitigation, weeks in advance of the anticipated summer Oakland Planning Commission public hearing, considering adoption of the Annex. The public review period will effectively last from January 2012-March 2012, with notices for public hearings and opportunities to comment via the City's website, and a notice in the Oakland *Tribune*. There will be a second public hearing during the winter of 2012, before the Public Safety Committee of the City Council. The Oakland City Council will consider a resolution to adopt the Oakland 2010 Annex to the MJ LHMP in a third public hearing in March 2012. The mitigation strategies will become an implementation amendment of the *Safety Element* of the Oakland General Plan. Copies of the City of Oakland website, and the Oakland *Tribune* notice, are Exhibit C of this Oakland 2010 Annex.

Past Occurrences of Disasters (natural and human-induced)

The City of Oakland has experienced a number of different disasters over the last 50 years, including numerous earthquakes, floods, droughts, wildfires, energy shortages, civil disturbances, landslides, and severe storms.

The Oakland Hills Firestorm of 1991 (the “Oakland-Berkeley Tunnel Fire”), for example, ranks as one of the worst wildland-urban firestorm disasters to ever strike the United States with 25 deaths, 150 injuries, and the displacement of over 10,000 persons. With destruction and damage to over 3,400 residential units, losses were in excess of \$1.5 Billion.

The Loma Prieta Earthquake of 1989 is another example of the kind of large scale disaster which can strike Oakland and the Bay Area. It killed 63 persons, injured 3,757, and displaced over 12,000 persons. With over 20,000 homes and businesses damaged and over 1,100 destroyed, this quake caused approximately \$6 Billion of damage. Reconstruction continues some two decades later as the replacement for Oakland-Bay Bridge is still several years from completion.

Oakland experienced its worst flooding conditions during the storm of October 1962. Specific information on past disasters and emergencies is contained in the 2004 Safety Element, on Oakland’s website.⁸

Recent declared disasters or local emergencies in Oakland, and in Alameda County were⁹:

- 2012 - -EOC Activations: Anti-Police Protests: January 7, 14, 21;
Occupy Oakland: January 28 and 29
- 2011 – Occupy Oakland EOC Activations: September, October, November and Dec.
- June 12, 2011 -EOC Partial Activation- Mehserle Release Protest March/Rally
- March 11, 2011 - EOC Partial Activation Tsunami Warning Result of 8.9 Earthquake Hondshu Japan
- 2010 - Mehserle Trial EOC Partial Activations: June 30-July 1; July 6-July 8; December 3
- February 27,2010 – Chile Earthquake/Tsunami (State EOC activated; Alameda County EOC monitored situation)
- January 2009 – Oscar Grant shooting/Mehserle verdict (Civil Disturbance)
- January 2008 Winter Storms (City of Oakland declared emergency)
- November 9, 2007 Cosco Busan Oil Spill; 53,000 gallons of oil spilled into SF Bay
- April 29, 2007 Freeway Collapse; tanker truck exploded, destroying section of I-80
- 2006 Spring Storms (Alameda County); flooding, landslides and mudslides
- 2005-2006 Winter Storms (Alameda County); flooding, landslides and mudslides

⁸ See: <http://www2.oaklandnet.com/Government/o/CEDA/o/PlanningZoning/s/GeneralPlan/DOWD009020>

⁹ 2010 Hazard Mitigation Plan, Appendix D: <http://quake.abag.ca.gov/wp-content/documents/ThePlan-D-2011.pdf>

More information on State and Federally declared disasters in Oakland is on ABAG's website¹⁰.

Hazards Assessment

The ABAG Multi-Jurisdictional Local Hazard Mitigation Plan lists nine hazards that impact the Bay Area; five related to earthquakes (faulting, shaking, earthquake-induced landslides, liquefaction, and tsunamis) and four related to weather (flooding, landslides, wildfires, and drought). Maps of these hazards and risks are shown on the ABAG website¹¹. The hazards pose a significant risk to residents and businesses in the City of Oakland. Oakland does not face any other hazards or any natural disasters not listed in the ABAG multi-jurisdictional plan, and no new hazards have been identified by the City since the original development of this plan in 2005.

The City has undertaken a number of hazard mapping activities since the first Seismic and Safety Elements were prepared by the City. Several of these maps are the same as those on ABAG's website.¹² Additional maps, which illustrate potential hazards to city-owned buildings and property, are included in this report, below.

The City examined the hazard exposure of City urban land based on ABAG's data.¹³ Of the 34,682 urban acres in the City:

- Earthquake faulting – 1,835 acres are in the Alquist-Priolo Earthquake Fault Study Zone.
- Earthquake shaking – most of the urban acres (33,925) are in the highest two categories of shaking potential, in large part because the Hayward fault runs through to the eastern portion of the City.
- Earthquake-induced landslides – the California Geological Survey has identified 4,742 acres in the Seismic Hazard Mapping Zones for this hazard.
- Earthquake liquefaction – 17,261 acres are in areas of moderate, high, or very high liquefaction susceptibility mapped by the U.S. Geological Survey; while 14,360 are in the California Geological Survey's Seismic Hazard Mapping Zones for this hazard.
- Tsunamis – While tsunamis may be a hazard in the City of Oakland, the mapping of the inundation area has not been completed at this time. Some recent research indicates that the run-up elevation may be as high as 50% of the wave height at the Golden Gate Bridge. Since that height is currently estimated at 42 feet, this would indicate that the height in Oakland would be as great as 21 feet. However, other researchers estimate that the maximum event would be far less. The most vulnerable facilities are in the waterfront area, particularly the lands owned by the Port of Oakland.
- Flooding –578 acres are in the 100-year flood plain, while an additional 1,865 acres are in other flood-prone areas.

¹⁰ <http://quake.abag.ca.gov/mitigation/ThePlan-D-Version-December09.pdf>

¹¹ <http://quake.abag.ca.gov/mitigation/>.

¹² See "Map Plates": <http://quake.abag.ca.gov/wp-content/documents/Map-Plates.pdf>

¹³ <http://quake.abag.ca.gov/mitigation/landuse/>

- Landslides – 2,034 acres are in areas of existing landslides (“mostly a landslide area”).
- Wildfires – 2,393 acres are subject to high, very high, or extreme wildfire threat; and 18,676 acres are in wildland-urban interface threat areas.
- Dam Inundation – 5,427 acres in Oakland are subject to dam failure inundation.
- Drought – all 34,682 urban acres in Oakland are subject to drought.

Risk Assessment

Urban Land Exposure

The City examined the hazard exposure of Oakland’s urban land, based on information in ABAG’s website¹⁴. The “2005 Existing Land Use with 2009 Mapping” file was used for this evaluation. For maps and more detailed descriptions of specific Hazards, see the Safety Element of the Oakland General Plan.¹⁵

In general, the hazard exposure of Oakland is increasing over time as the amount of urban land increases (In the last five years, 871 acres of land has become urban). Oakland actually reduced the acres of urban land in the 100 year flood zone over the last 5 years due to changes in the new FEMA flood maps. Table 1 describes the exposure of urban land within the City to the various hazards.

¹⁴ See <http://quake.abag.ca.gov/mitigation/landuse>

¹⁵ Available at: <http://www2.oaklandnet.com/Government/o/CEDA/o/PlanningZoning/s/GeneralPlan/DOWD009020>

Table 1. Exposure (acres of urban land)			
Hazard	Plan Year 2005	Plan Year 2010	Change
<i>Total Acres of Urban Land</i>	33,811	34,682	871
Earthquake Faulting (within CGS zone)	1,858	1,835	(23)
Earthquake Shaking (within highest two shaking categories) ¹⁶	33,081	33,925	844
Earthquake-Induced Landslides (within CGS study zone) ¹⁷	4,586	4,742	156
Liquefaction (within moderate, high, or very high liquefaction susceptibility)	16,247	17,261	1,014
Flooding ¹⁸ (within 100 year floodplain)	663	578	(85)
Flooding (within 500 year floodplain)	1,756	1,865	109
Landslides (within areas of existing landslides)	2,335	2,034	301
Wildfire (subject to high, very high, or extreme wildfire threat) ¹⁹	2,495	2,393	(102)
Wildland-Urban Interface Fire Threat	19,251	18,676	(575)
Dam Inundation (within inundation zone)	5,354	5,427	73
Sea Level Rise ²⁰	Further research needed		
Tsunamis ²¹ (within inundation area)	Further research needed		
Drought ²²	33,811	34,682	871

Infrastructure Exposure

The City of Oakland also examined the hazard exposure of infrastructure within the jurisdiction based on the information on ABAG's website.²³ Of the 1,178 miles of roadway in Oakland, Table 2 shows the miles of roadway (as well as transit and rail infrastructure) which are exposed to the various hazards analyzed.

¹⁶ In large part because the Hayward, Greenville, and Calaveras fault systems run through the County.

¹⁷ The California Geological Survey continues to map Alameda County and added the Livermore-Altamont area in late 2009. Though some areas of the County have not yet been completely mapped, the densely populated areas in Alameda County are mostly done.

¹⁸ Urban land exposure to 100 year floodplain decreased, likely due to better and more accurate FEMA mapping.

¹⁹ The decrease is due to better and more accurate mapping.

²⁰ The sea level rise map is not a hazard map. It is not appropriate to assess infrastructure exposure to sea level rise.

²¹ Tsunami evacuation planning maps were not available inside the San Francisco Bay in 2005. This map became available in December 2009. Acres of exposed land are not an appropriate analysis for this hazard. It should be noted that this map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.

²² The entirety of the City of Oakland is subject to drought.

²³ See <http://quake.abag.ca.gov/mitigation/pickdbh2.html>

Hazard	Roadway		Transit		Rail	
	Plan Year 2005	Plan Year 2010	Plan Year 2005	Plan Year 2010	Plan Year 2005	Plan Year 2010
<i>Total Miles of Infrastructure</i>	1,086	1,178	19	30	39	44
Earthquake Shaking (within highest two shaking categories)	1,078	1,166	18	30	38	42
Liquefaction Susceptibility (within moderate, high, or very high liquefaction susceptibility)	516	642	14	27	36	43
Liquefaction Hazard (within CGS study zone) ²⁴	422	496	14	24	39	42
Earthquake-Induced Landslides (within CGS study zone) ²⁵	69	66	1	1	0	0
Earthquake Faulting (within CGS zone)	66	72	0	0	0	0
Flooding (within 100 year floodplain)	12	8	0	0	1	1
Flooding (within 500 year floodplain)	58	70	3	5	5	7
Landslides (within areas of existing landslides)	46	73	0	0	0	0
Wildfires (subject to high, very high, or extreme wildfire threat)	54	42	0	0	0	0
Wildland-Urban Interface Fire Threat	560	608	6	9	4	8
Dam Inundation (within inundation zone)	179	203	4	7	6	7
Sea Level Rise ²⁶	More research needed					
Tsunamis ²⁷	More research needed					
Drought ²⁸	not applicable					

²⁴ 681 miles of roadway, 6 miles of transit, and 2 miles of rail are outside the area that has been evaluated by CGS for this hazard

²⁵ 1,112 miles of roadway, 29 miles of transit, and 44 miles of rail are outside the area that has been evaluated by CGS for this hazard

²⁶ The sea level rise map is not a hazard map. It is not appropriate to assess infrastructure exposure to sea level rise.

²⁷ Tsunami evacuation planning maps were not available inside the San Francisco Bay in 2005. This map became available in December 2009. Miles of exposed infrastructure is not an appropriate analysis for this hazard. It should be noted that this map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.

²⁸ Drought is not a hazard for roadways.

Exposure of Oakland City-Owned Buildings, Plus Critical Healthcare Facilities and Schools

The City provided a list of City-owned buildings, critical health care facilities and schools within City limits to ABAG; ABAG provided a detailed assessment of the hazard exposure of each of these facilities. Table 3 shows the number of facilities exposed to the various hazards analyzed.¹

¹ For data, see ABAG's website, <http://quake.abag.ca.gov/mitigation/pickcrit2010.html>.

Table 3. Exposure (number of facility types)

Hazard	Hospitals ²		Schools		City-owned ³ critical facilities		City-owned bridges and interchanges	
	Plan Year 2005	Plan Year 2010	Plan Year 2005	Plan Year 2010	Plan Year 2005	Plan Year 2010	Plan Year 2005	Plan Year 2010
<i>Total Number of Facilities</i>	7	8	133	205	65	312	157	155
Earthquake Shaking (within highest two shaking categories)	7	8	133	204	65	311	157	152
Liquefaction Susceptibility (within moderate, high, or very high liquefaction susceptibility)	4	4	61	121	51	176	131	134
Liquefaction Hazard (within CGS study zone)	2	3	47	72	42	119	123	123
Earthquake-Induced Landslides (within CGS study zone)	0	0	9	0	2	0	1	0
Earthquake Faulting (within CGS zone)	0	0	5	8	1	30	0	0
Flooding (within 100 year floodplain)	0	0	1	0	0	1	4	2
Flooding (within 500 year floodplain)	0	0	7	14	4	22	31	30
Landslides (within areas of existing landslides)	0	0	0	0	2	15	3	1
Wildfires (subject to high, very high, or extreme wildfire threat)	0	0	2	0	0	4	3	0
Wildland-Urban Interface Fire Threat	2	4	65	91	28	173	60	61
Dam Inundation	2	3	20	33	9	31	44	45
Sea Level Rise (exposed to 16" and 55" sea level rise) ⁴	-	-	-	-	-	-	-	-
Tsunamis ⁵ (within inundation area)	-	-	-	-	-	-	-	-
Drought ⁶	-	-	-	-	-	-	-	-

² ABAG collected data on Hospitals, Long Term Care Facilities, Primary Care or Specialty Clinics, and Home Health Agencies or Hospices. This table only shows the data for Hospitals. Further information available at <http://quake.abag.ca.gov/mitigation/pickcrit2010.html>

³ ABAG collected data on City-Owned, County-Owned, and Special District-Owned facilities. This table reports only the data for City-owned facilities. Further information available at <http://quake.abag.ca.gov/mitigation/pickcrit2010.html>.

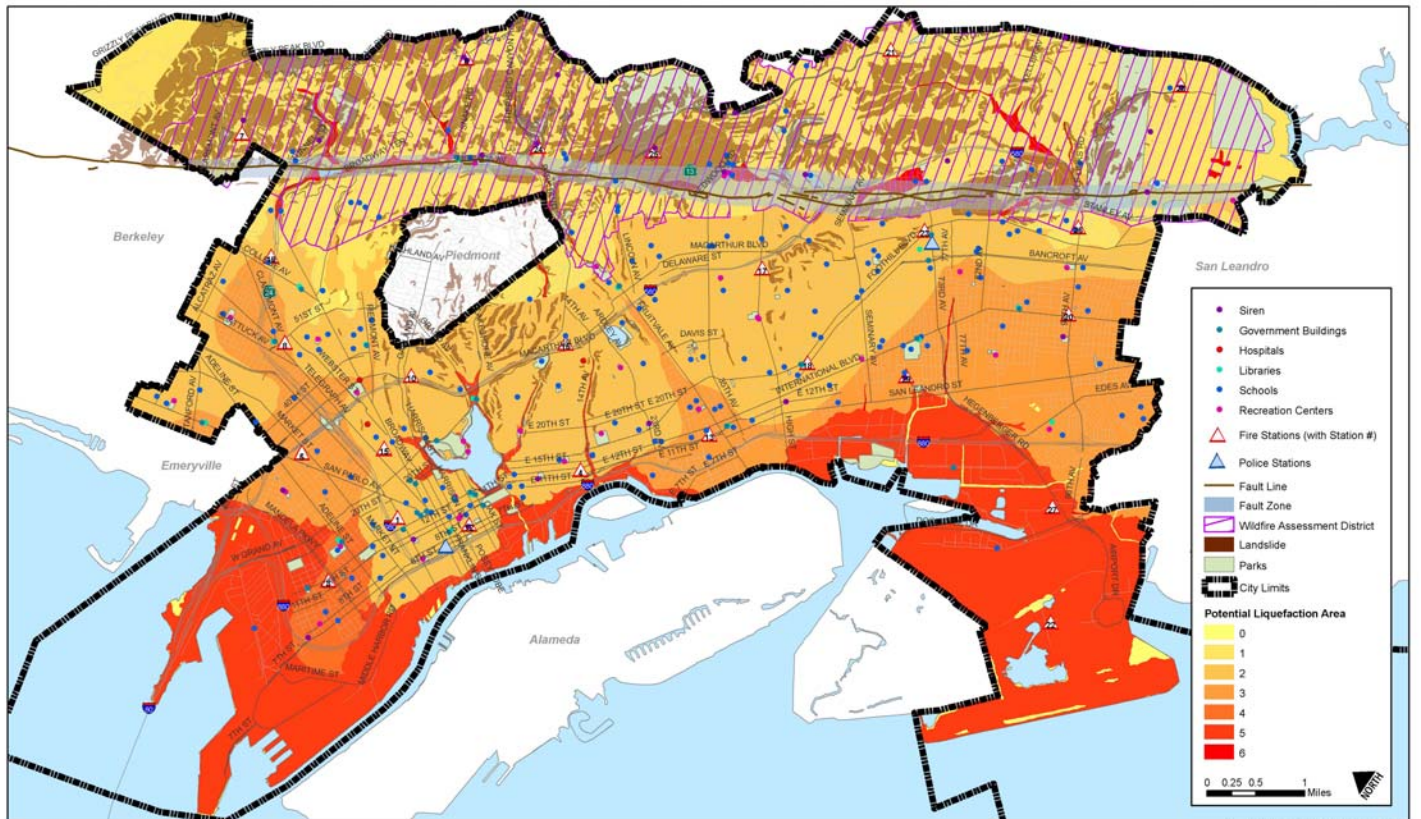
⁴ Sea level rise data was not available in 2005

⁵ Tsunami evacuation planning maps were not available inside the San Francisco Bay in 2005. This map became available in December 2009. It should be noted that this map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.

⁶ Drought will not affect locally owned facilities directly.

Maps of Hazards and City facilities

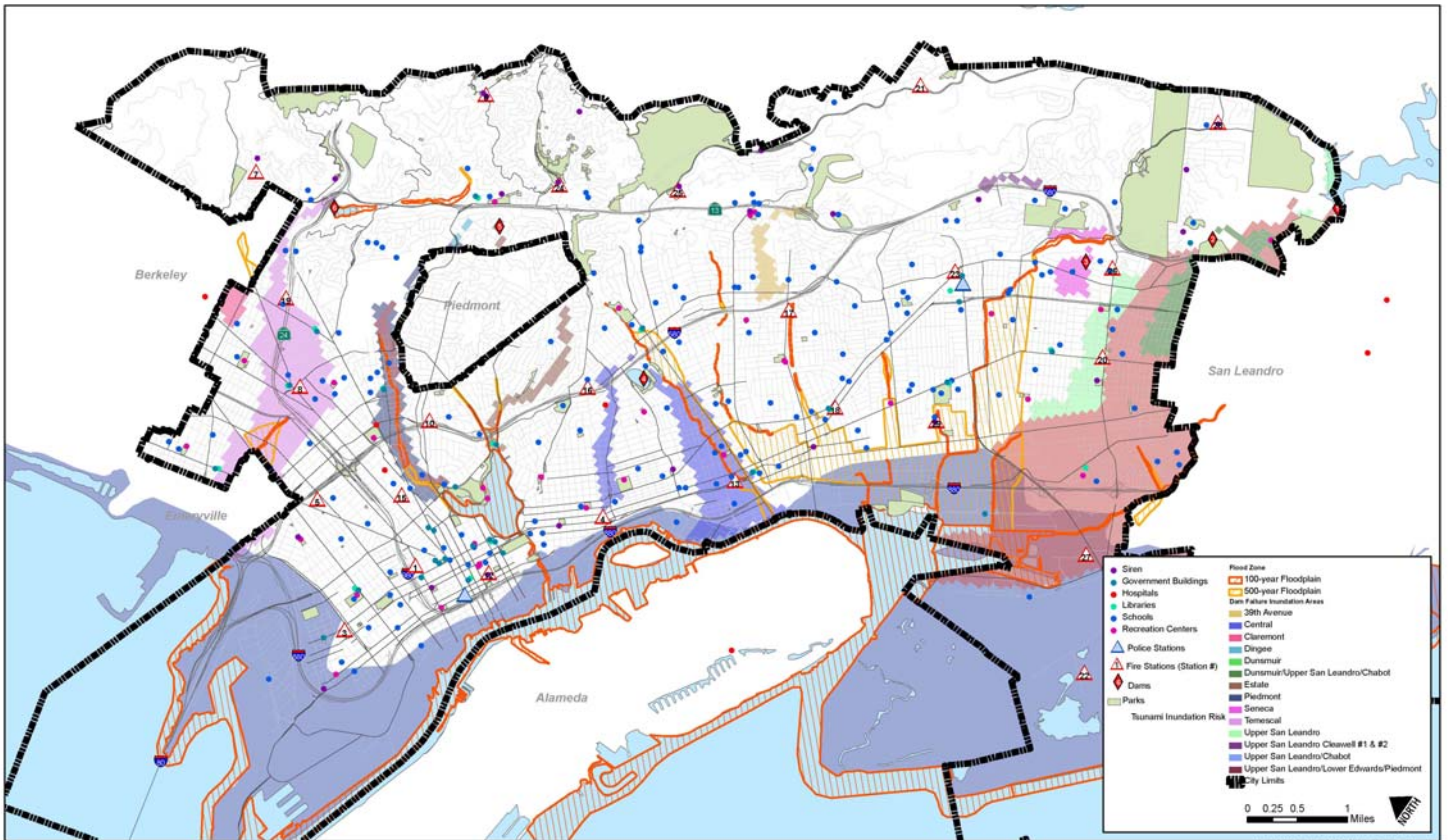
The City of Oakland has mapped critical facilities, such as schools, hospitals, and other city-owned structures and facilities with the latest data on major hazards, such as flooding, and liquefaction. The following maps show those hazards (geologic and hydrologic), and those facilities.



City of Oakland, CEDA, Strategic Planning
September 2011



Local Hazard Mitigation Plan 2011
Local Geological Hazard Information - Geological



City of Oakland, CEDA, Strategic Planning
September 2011



Local Hazard Mitigation Plan 2011
Local Natural Hazard Information -- Hydrological

Other risks

The City of Oakland will continue to work with ABAG to improve the risk assessment information being compiled by ABAG, including developing ways to assess how many soft-story buildings are located in the City. In 2010-2011, Oakland began a self-reported soft-story inventory for building owners, and is considering requiring mandatory retrofits for property owners.

The City's Sustainable Oakland staff participates in the joint San Francisco Bay Conservation and Development Commission/National Oceanic Atmospheric Administration program, Adapting to Rising Tides.³⁵ This forum brings together regional stakeholders to address impacts from eventual sea level rise in the Bay, and on surrounding communities.

Natural Gas pipelines run through Oakland, and rupture of a gas pipeline could lead to an explosion. Pipelines run under San Leandro Street in East and Central Oakland, under 2nd and 4th Streets in Jack London Square, and under Linden Street in West Oakland. PG&E provides a map of these pipelines on its website³⁶, and also keeps a list of pipeline segments which are monitored, the "Top 100" list. No pipelines in Oakland, however, are on PG&E's "Top 100" list.

Oakland has a high exposure to "manmade hazards," which FEMA describes³⁷ as terrorism and technological hazards, such as hazardous materials releases. Oakland has the Port of Oakland, regional attractions such as the Oakland Coliseum, regional transportation such as BART and high profile governmental facilities such as the Post Office in West Oakland. The City's *Safety Element*, in chapters on "Public Safety" and "Hazardous Materials," describes the policies and actions the City takes to prevent manmade hazards from occurring³⁸.

The conclusion is that earthquakes (particularly shaking), wildfire, and landslides (including unstable earth) pose a significant risk for potential loss. As noted in the City's *Safety Element*, in addition to the Hayward fault, Oakland is in close proximity to the Calaveras and San Andreas faults. Of these three faults, the Hayward fault poses the most serious threat by far to Oakland, due to its location through the city, the intensity of land uses near the fault zone, and the long interval since a major quake along the fault. There are no additional risks or vulnerabilities which Oakland is planning mitigation measures for, beyond those reported in the Bay Area MJ LHMP.

³⁵ See project website, <http://risingtides.csc.noaa.gov/index.html>

³⁶ See PGE website: <http://www.pge.com/myhome/edusafety/systemworks/gas/transmissionpipelines/index.shtml>

³⁷ See FEMA report, "Integrating Manmade Hazards into Mitigation Planning" (pg 11): http://hazardmitigation.calema.ca.gov/docs/howto7_Integrating_Manmade_Hazards.pdf

³⁸ See City of Oakland *Safety Element*, pages 11 and following, and 71 and following: <http://www2.oaklandnet.com/Government/o/CEDA/o/PlanningZoning/s/GeneralPlan/DOWD009020>

National Flood Insurance Program

The City of Oakland has participated in the National Flood Insurance Program (NFIP) since 1970³⁹. The most recent action which continues the City's compliance with the NFIP was in 2009⁴⁰. FEMA reports that there are 310 flood insurance policies in Oakland, representing a total coverage of \$86 million. There have been 78 paid flood insurance losses in Oakland—for a total of \$266,564.

Repetitive Loss Properties

FEMA defines a “repetitive loss property” as a “property for which two or more National Flood Insurance Program losses of at least \$1,000 each have been paid within any ten year period since 1978.”

As of November, 2011, there are six repetitive loss properties in the City of Oakland, according to FEMA⁴¹. Of the six properties, one is inside the special flood hazard area, and all properties are residential.⁴² By comparison, in 2004, the City had five repetitive loss properties that were outside the flood plain.

Mitigation Goals and Objectives

The goal of the ABAG MJ-LHMP is to maintain and enhance a disaster-resistant region by reducing the potential for loss of life, property damage, and environmental degradation from natural disasters, while accelerating economic recovery from those disasters. This goal is unchanged from the 2005 plan and continues to be the goal of the City of Oakland in designing its mitigation program.

Additionally, the City of Oakland has the specific objective of reducing the number of public and private buildings within the City that are vulnerable to the effects of earthquakes. The City has focused on seismic retrofitting as a pre-disaster mitigation. The program has two prongs:

- Seismic Retrofitting for single family homeowners
- Seismic Screening for property owners of multi-family soft story residential buildings of 5 or more units.

Single Family Program

In July 2008, when Oakland had a surplus in real estate transfer taxes, the City instituted the Seismic Strengthening Incentive Program for Single Family Homeowners. The City set aside \$1 million from real estate transfer tax for a two year program. Details of the program included:

³⁹ Oakland has been, according to FEMA, a “full status” member in the program, since 1982.

⁴⁰ See Ordinance 12960, adopted July 21, 2009.

⁴¹ Phone discussion with Sarah Owen, of the National Flood Insurance Program. Also, see ABAG's website: <http://quake.abag.ca.gov/mitigation/pickflood.html>.

⁴² According to FEMA, payments to these six properties from the Flood Insurance Program total \$51,000.

- Flat rate permit fee (\$250) for those who met the City's retrofitting standards (otherwise, applicants would pay 10% of construction fee for the permit)
- Applicants who signed up within 60 days of purchase, and met the City's seismic retrofitting standards, and completed the retrofitting within 18 months, were eligible for up to \$5,000 reimbursement
- The City included retrofitting standards—akin to Plan Set A or a custom designed plan by a licensed structural engineer—in its Building Code.

At the time, the State of California had not adopted such a code, and Oakland was one of the first to do so. This was important because consumers had no way of comparing bids, or assuring that what they were paying for was effective. Last fall, the State adopted standards.

The Single Family seismic retrofit program wildly successful. In the year prior to implementation, only six people had taken out retrofit permits. During the two years the program was funded, more than 360 people participated, showing the City that incentives do work. It also showed staff that the most effective outreach was to connect with property owners purchasing older homes at the time of purchase. Owners understood that by performing the seismic retrofit, they were protecting a large investment, and adding the typical cost of a \$3,000 to \$10,000 for retrofitting at the time they were applying for the mortgage was not onerous.

The City offers a similar program to home owners who live in one of the city's redevelopment zones and meet federal low income requirements. Participants eligible for \$5,000 grant for half the cost of retrofitting; the remainder can come from no-cost loans. This current program has had only a few applicants.

Mandatory Soft Story Screening Program

Working with Association of Bay Area Governments, Earthquake Engineering Research Institute, Structural Engineering Association of Northern California and others, Oakland identified 1,500 potential soft-story multi-family apartments and condominiums.

In July 2009, Council passed a mandatory soft-story screening program that requires property owners to complete a simple, low-cost screening to verify that the building is, indeed, a soft-story multi-family structure that has not yet been retrofitted.

When the survey is completed (approximately by 2012) Council will determine next steps, either a mandatory structural engineering report and voluntary or mandatory seismic retrofit.

Typical engineering costs \$10,000; retrofitting of the first floor runs about \$10,000- \$50,000 or more, per unit.

Mitigation Activities and Priorities

Evaluation of Progress from 2005 Plan

As a participant in the 2010 ABAG multi-jurisdictional planning process, the staff of the City of Oakland helped in the development and review of the comprehensive list of mitigation strategies in the overall multi-jurisdictional plan, known as *Taming Natural Hazards*. Appendix G of ABAG's *Taming Natural Hazards* presents a summary list of the more than 300 mitigation strategies and actions, with regional priorities and the hazards mitigated.⁴³ The decision on priority was made based on a variety of criteria, not simply on an economic cost-benefit analysis. These criteria include being technically and administratively feasible, politically acceptable, socially appropriate, legal, economically sound, and not harmful to the environment, or to our heritage. Representatives from multiple departments then met on a regular basis to review progress on Oakland's 2005 strategies, to identify and prioritize additional mitigation strategies to update the list.

These draft priorities were submitted to management of the City's Community and Economic Development Agency and the Fire Department's Office of Emergency Services, for review. The draft priorities will be provided to the Oakland Planning Commission and the Oakland City Council for adoption in the beginning of 2012.

The Oakland planning team also prioritized specific mitigation tasks for the next five years. This list includes implementation process, funding strategy, responsible agency, and approximate time frame.

The City ranked those regional strategies and actions in a spreadsheet, using the following scale:

- Existing Program
- Existing Program, Underfunded
- Very High – Unofficial Program – Becomes Official on Plan Adoption, No Funding Needed
- High – Actively Looking for Funding
- Moderate
- Under Study
- Not Applicable, Not Appropriate, or Not Cost Effective
- Not Yet Considered

A summary of these rankings is presented in Attachment B to this annex: Oakland Mitigation Strategies and Actions 2010. Oakland's ranking of priorities on the mitigation measures were essentially unchanged from the 2005 LHMP to the 2010 MJ LHMP. The single exception is:

⁴³ See ABAG's website, <http://quake.abag.ca.gov/wp-content/documents/ThePlan-G-2010.pdf>

- *Housing G-4. Create or identify “model” properties showing defensible space and structural survivability in neighborhoods that are wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat.*
2005 priority: Moderate; 2010 priority: Existing program.

Completed Projects

As noted in the 2005 Local Hazard Mitigation Plan, the City has retrofitted several critical facilities, including City Hall and seventeen of the twenty-five fire stations, for earthquake shaking. If a retrofit was not cost effective, the fire station was demolished and replaced. Seven fire stations have been rebuilt during the years 1994, 1995, 1997 (2), 1998, 1999, 2002 and 2010.

In 2008, the City also adopted the S-19 Health and Safety Protection Combining Zone. The intent of the zone is to promote the public health, safety and welfare by ensuring that activities and businesses which use hazardous material substances or store hazardous materials, hazardous waste, or explosives locate in appropriate locations and develop in such a manner as not to be a serious threat to the environment, or to public health, particularly to residents living adjacent to industrial areas where these materials are commonly used, produced or found.

In 2009, City staff participated, and ABAG adopted the *Long-Term Disaster Recovery Plan – Part One*, the intention of which is:

to develop a model action plan for the City of Oakland, as well as to identify the components of this type of plan for the cities and counties of the San Francisco Bay Area. We hope that this Plan serves as a catalyst for dialog on public policies and actions needed to improve disaster recovery planning.

This June 2009 Plan only covers four of the nine issues identified by ABAG as critical to recovery financing issues: recovery of government facilities and services; long-term housing recovery; and long-term recovery of business. It is the intent of ABAG to prepare the second portion of this document that will have additional chapters covering long-term recovery of health care, schools and education, utilities and transportation, and land use change, as well as the overall issue of governance.⁴⁴

Current Projects

There are several current projects the City is completing which will enhance its response to and recovery from a disaster. The City is currently updating the plans and operations programs which guide staff and employees during disaster recovery. During the summer of 2011, a team of OES staff is directing a comprehensive update of the City’s Emergency Operations Plan. In addition, OES staff is also updating specific annexes to the Regional Catastrophic Preparedness Grant Program (as adopted by the Council in 2009).

⁴⁴ See page ii of the Report: <http://quake.abag.ca.gov/wp-content/uploads/2010/10/PR-Recovery-Oakland-Phase-One1.pdf>

City staff and stakeholders from area hospitals, utilities and other groups meet quarterly as the Emergency Management and Preparedness Council, staffed by OES. In addition, OES runs Citizens of Oakland Responding to Emergencies (CORE), which, since its inception in 1990, has provided free, community-based training to more than 18,000 residents.

The City is underway on its Soft Story Seismic Screening program. In 2009, the City Council adopted an ordinance which created a mandatory seismic screening program for residential buildings (of five or more units). Building owners, after notification by the City, have until July 29, 2011 to submit a screening form. The Building Official (in the Community and Economic Development Agency) is processing and analyzing the forms submitted to date, in order to prepare an inventory of soft-story buildings in Oakland.

In June, 2011, the City completed the “Project 25 Public Safety Communications” system upgrades, continuing to fulfill the City’s long-standing commitment to advancing the goal of regional interoperable public safety radio communications. The City has received millions of dollars of federal grants and invested millions of dollars in local revenues to further this mission. The City now has a new, all-digital emergency communications system that is fully compliant with the national P25 interoperability communications standard.

In January 2012, the City sought continuation of an existing contract with an international engineering firm, enabling them to continue their design, bidding and construction support for the seismic upgrades of seven bridges owned by Caltrans in the City of Oakland, under the Seismic Safety Retrofit Program. Completion of bridge seismic retrofit projects will ultimately improve seismic response of City facilities during earthquakes.

Future Mitigation Actions and Priorities

The City of Oakland is participating in a Bay Area regional Public Safety Broadband Technology project—a series of 4G networks which will enable different public safety agencies to share maps, video and other critical data via broadband communications networks. This regional system will be available during day to day emergencies and in the event of a disaster which could disable standard communications and data sharing systems. The City’s Department of Information Technology, Fire Department, Police Department and Office of Emergency Services are involved in this innovative Bay Area regional the 700 MHz Public Safety Broadband Network will be designed to assist (police officers) to have instant access to criminal databases for suspect information, improved situational awareness using video technologies, and real time tracking of assets for firefighters and law enforcement agencies would be eventually available throughout the region.

For example, utilizing a shared voice and broadband data network, a battalion chief at an incident scene could communicate directly with a power utility worker, while downloading critical building floor plan information, and uploading video to the Incident Commander at an emergency incident. A police commander could communicate with mutual aid partners, such

as the state patrol, or federal partners, to secure perimeters and effectively deploy resources. This program implements mitigation measure Government C-7. The pilot broadband system will be completed by or about July 2013. A Joint Powers Agreement is being developed to determine future enhancements and how the system will be built, operated/managed and maintained.

Another new project over the next five years is the validation of Oakland's soft-story buildings inventory, relative to vulnerable facilities during a major earthquake on the Hayward Fault.

On-Going Mitigation Strategy Programs

The City of Oakland has many on-going mitigation programs that help create a more disaster-resistant city. The following list selects from those programs and policies identified as *Existing Programs* in the mitigation strategy spreadsheet. Others are on-going programs that are currently *underfunded*. Appendix B contains all 300 policies that ABAG adopted in the MJ LHMP, and Oakland's assignment of priorities to each policy. It is the City's priority to find additional funding to sustain these on-going programs over time.

- Conduct an inventory of privately-owned existing or suspected soft-story commercial or industrial structures as a first step in establishing voluntary or mandatory programs for retrofitting these buildings. (Economy-b-4)
- Comply with applicable performance standards of any National Pollutant Discharge Elimination System municipal stormwater permit that seeks to manage increases in stormwater run-off flows from new development and redevelopment construction projects. (Environment-a-6)
- Prepare a basic Recovery Plan that outlines the major issues and tasks that are likely to be the key elements of community recovery, as well as integrate this planning into response planning (such as with continuity of operations plans). (Government b-2)
- Participate in developing and maintaining a system of interoperable communications for first responders from cities, counties, special districts, state, and federal agencies. (Government-C-7)
- Maintain the local government's emergency operations center in a fully functional state of readiness. (Government-c-10)
- Participate in FEMA's National Flood Insurance Program. (Government-d-5)
- Continue to actively implement existing State law that requires cities and counties to maintain lists of the addresses of unreinforced masonry buildings and inform private property owners that they own this type of hazardous structure. (Housing d-1)
- As an infrastructure operator, designate a back-up Emergency Operations Center with redundant communications systems. (Infrastructure a-21)
- Use hazard abatement districts as a funding mechanism to ensure that mitigation strategies are implemented and enforced over time. (Land G-1)

Incorporation into Existing Planning Mechanisms

The City of Oakland will adopt the policies and priorities of the 2010 LHMP annex as an amendment to the 2004 *Safety Element* of the General Plan. The *Safety Element* is the City's overall policy document for addressing and mitigating hazards such as public safety, geologic hazards (earthquakes), fire, hazardous materials and flooding. In addition, the City enforces the requirements of the California Environmental Quality Act (CEQA), which, since 1988, requires mitigation for identified natural hazards. The City used these pre-existing policies and regulations as a basis for identifying gaps which may lead to disaster vulnerabilities, in order to work on ways to address these risks through mitigation.

In March, 2011, the City brought a draft Energy and Climate Action Plan to the City Council, which outlines a ten year plan, including more than 150 actions, that will enable Oakland to achieve a 36% reduction in green house gas emissions by 2020⁴⁵. The Plan also recommends steps the City can take to help Oakland adapt to the impacts of climate change and increase community resilience.

The City funds a Capital Improvement Program (CIP), which was last adopted as part of the 2009-2011 budget. The CIP includes funds for projects which will improve mitigation to hazards in Oakland.⁴⁶

Annex -- Update Process

As required Disaster Mitigation Act of 2000, the City of Oakland will update this Annex at least once every five years, by participating in a multi-agency effort with ABAG and other agencies to develop a multi-jurisdictional plan.

The City 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 Office of Emergency Services will ensure that monitoring of this Annex will occur. The plan will be monitored on an on-going basis. However, the major disasters affecting our City, legal changes, notices from ABAG as the lead agency in this process, and other triggers will be used. Finally, the Annex will be a discussion item on the agenda of the meeting of department leaders at least once a year in April. At that meeting, the department heads will focus on evaluating the Annex in light of technological and political changes during the past year or other significant events. The Department leaders will be responsible for determining if the plan should be updated.

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 annex, the City will provide the opportunity for the public to comment on the updates, announced through the City's website⁴⁷

⁴⁵ See <http://www2.oaklandnet.com/oakca/groups/pwa/documents/policy/oak024383.pdf>

⁴⁶ See <http://www2.oaklandnet.com/oakca/groups/cityadministrator/documents/policy/dowd005562.pdf>

⁴⁷ See City's webpage: www.oaklandnet.com.

and at two public hearings in the winter of 2012. A public notice will be printed in the Oakland *Tribune*, prior to the meeting, to announce the comment period and meeting logistics. Copies of the public outreach materials is attached to the report as Exhibit C.

Mitigation Plan Point of Contact

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Exhibit A- City Participation in Emergency Preparedness Coordination

Management and staff of the Oakland Fire Department's Office of Emergency Services conducts, or participates as members in the following boards, councils or groups:

Federal

- Federal Emergency Management Agency (FEMA) National Advisory Committee and subcommittees on Special Needs, National Response Framework, Post Disaster Housing, Stafford Act, Target Capabilities List and Urban Search & Rescue
- International Association of Emergency Managers (IAEM)
- FEMA Region 9 Advisory Council
- FEMA Target Capabilities Implementation Project - Risk Management Technical Working Group
- Federal Executive Board - San Francisco Continuity of Operations (COOP) Working Group

State

- Statewide Emergency Preparedness Committee (SWEPC)
- California Emergency Managers Association (CESA)
- Medical Reserve Corps Advisory Committee (MRC)
- California Emergency Management Agency (CalEMA)
- Coastal Region's Mutual Aid Regional Advisory Committee (MARAC)
- Bay Area Urban Area Strategic Initiative (BAUASI) member of Approval Authority, Emergency Management Advisory Group and planning groups for Training and Exercise, CBRNE (Chemical, Biological, Radiological, Nuclear & Explosives), Information Sharing, Infrastructure Protection, Communications Interoperability, Medical/Health Preparedness, Public Information/Crisis Communication and Community & Economic Resiliency
- Association of Bay Area Governments (ABAG) Hazard Mitigation Advisory Committee
- VOAD (Volunteer Organizations Active in Disasters) for Northern California
- American Red Cross, Bay Area
- Northern California Area Maritime Security Committee (AMSC)
- Radio Amateur Civil Emergency Service (RACES)
- Bay Area Resiliency Network (BARN)
- Regional Catastrophic Preparedness Grant Program (RCPGP) member of Advisory Group and subcommittees for Debris Management, Transportation & Evacuation, Mass Care & Shelter, Mass Fatality and Volunteer Management
- Golden Guardian 2010 BAUASI Steering Committee
- Bay Area Terrorism Working Group (BATWG)
- Terrorism Liaison Officers Working Group (TLO)
- Northern CA Regional Terrorism and Threat Assessment Center (NC-RTTAC)
- Metropolitan Transit Committee (MTC)

- San Francisco Bay & Delta Area Committee
- Region II Public Health Emergency Preparedness Coordinators
- BARC/*first* (Bay Area Response Coalition - financial services)
- BENS (Business Executives for National Security)
- BRMA (Business Recovery Managers Association)

Local

- Alameda County's Emergency Managers Association (ALCO EMA)
- Alameda County's Terrorism Early Warning Group (TEWG)
- Alameda County's Volunteer Management Working Group [
- Alameda County's Mass Care & Shelter Working Group
- Alameda County Health & Medical Strategic Initiative Planning Group and subcommittee on Leadership
- Alameda County Medical Center's Disaster Council
- Alameda County Local Oil Spill Contingency Planning Group
- Communities of Oakland Respond to Emergencies (CORE) Advisory Task Force
- Oakland Radio Communications Association (ORCA)
- Emergency Management and Disaster Preparedness Council (EMADPC) Officer and members of task forces for Transportation, Mass Care, Mass Transportation & Evacuations and Labor & other Groups
- Mayor's Commission on Aging
- Mayor's Commission on Persons with Disabilities
- City of Oakland Golden Guardian Planning Group
- City of Oakland Paratransit Roundtable Planning Group
- City of Oakland Hazard Mitigation Plan Strategies Group
- Oakland Aviation Security Committee
- Amtrak Station Action Planning Committee
- Berkeley-East Bay Humane Society
- Oakland Medical Reserve Corps
- Oakland Chamber of Commerce
- Port of Oakland Emergency Notification Working Group
- Port of Oakland Investment Justification Grant Planning Group
- Port of Oakland Marine Terminal Response Committee

Exhibit B - Oakland Priorities for Mitigation Strategies

These are the priorities that City of Oakland staff assigned to the ABAG Multi-Jurisdiction Local Hazard Mitigation Plan Strategies. The strategies are grouped by topic: Economy; Education; Environment; Government; Health; Housing; Infrastructure; and Land Use. For a complete list of the Mitigation Plan Strategies, and the Oakland departments working on each particular program, see the Oakland table on ABAG's website:

<http://www.abag.ca.gov/bayarea/eqmaps/mitigation/strategy.html>

City staff assigned each strategy one of the following priorities:

- **Existing Program.** Mitigation strategy is an existing program for the selected jurisdiction and is adequately funded.
- **Existing Program, Underfunded.** Mitigation strategy is an existing program for the selected jurisdiction, but additional funds are needed to fully implement the strategy (new in 2009-2010).
- **Very High.** This is an unofficial program which will be adopted by the local government immediately upon adoption of its annex.
- **High.** The jurisdiction has plans to implement the strategy as soon as funding and resources allow; funding currently being sought.
- **Moderate.** The jurisdiction has plans to implement the strategy as soon as funding and resources allow; but funding is not currently being sought.
- **Under Study.** Implementation of this strategy is actively under study by a specific department or agency within the jurisdiction; not just to be studied at a future date.
- **N/A** This strategy is not applicable, not appropriate, or not cost-effective.
- **NYC.** This strategy has never been considered by the jurisdiction.

City of Oakland
Annex to Local Hazard Mitigation Plan

Number	Specific Mitigation Strategy	Oakland Priority	Responsible Agencies
Economy: Multi-Hazard			
ECON-a-1	Assist in ensuring adequate hazard disclosure by working with real estate agents to improve enforcement of real estate disclosure requirements for commercial and industrial properties with regard to seven official natural hazard zones: 1) Special Flood Hazard Areas (designated by FEMA), 2) Areas of Potential Flooding from dam failure inundation, 3) Very High Fire Hazard Severity Zones, 4) Wildland Fire Zones, 5) Earthquake Fault Zones (designated under the Alquist-Priolo Earthquake Fault Zoning Act), and the 6) Liquefaction and Landslide Hazard Zones (designated under the Seismic Hazard Mapping Act).	Existing	
ECON-a-2	Create incentives for private owners of historic or architecturally significant commercial and industrial buildings to undertake mitigation to levels that will minimize the likelihood that these buildings will need to be demolished after a disaster, particularly if those alterations conform to the federal Secretary of the Interior's Guidelines for Rehabilitation.	Existing Underfunded	CEDA/Historic Preservation
Economy: Soft-Story Commercial Buildings Vulnerable to Earthquakes			
ECON-b-1	Require engineered plan sets for voluntary or mandatory soft-story seismic retrofits by private owners until a standard plan set and construction details become available.	Existing	CEDA/Building Services
ECON-b-2	Adopt the 2009 International Existing Building Code or the latest applicable standard for the design of voluntary or mandatory soft-story building retrofits for use in city/county building department regulations. In addition, allow use of changes to that standard recommended by SEAOC for the 2012 IEBC.	Existing	CEDA/Building Services
ECON-b-3	Work to educate building owners, local government staff, engineers, and contractors on privately-owned soft-story retrofit procedures and incentives using materials such as those developed by ABAG and the City of San Jose (see http://quake.abag.ca.gov/eqhouse.html .)	Moderate	CEDA/Building Services
ECON-b-4	Conduct an inventory of privately-owned existing or suspected soft-story commercial or industrial structures as a first step in establishing voluntary or mandatory programs for retrofitting these buildings.	Existing	CEDA/Building Services
ECON-b-5	Use the soft-story inventory to require private owners to inform all existing tenants (and prospective tenants prior to signing a lease agreement) that they may work in this type of building.	Moderate	CEDA/Building Services
ECON-b-6	Use the soft-story inventory to require private owners to inform all existing and prospective tenants that they may need to be prepared to work elsewhere following an earthquake if the building has not been retrofitted.	Moderate	CEDA/Building Services

City of Oakland
Annex to Local Hazard Mitigation Plan

Number	Specific Mitigation Strategy	Oakland Priority	Responsible Agencies
ECON-b-7	Investigate and adopt appropriate financial, procedural, and land use incentives (such as parking waivers) for private owners of soft-story buildings to facilitate retrofit such as those described by ABAG (see http://quake.abag.ca.gov/fixit).	Moderate	CEDA/Building Services/Planning and Zoning
ECON-b-8	Explore development of State regulations or legislation to require or encourage private owners of soft-story structures to strengthen them.	Moderate	
ECON-b-9	Provide technical assistance in seismically strengthening privately-owned soft-story structures.	Under Study	CEDA/Building Services
Economy: Unreinforced Masonry Buildings in Older Downtown Areas			
ECON-c-1	Continue to actively implement existing State law that requires cities and counties to maintain lists of the addresses of unreinforced masonry buildings and inform private property owners that they own this type of hazardous structure.	Existing	CEDA/Building Services
ECON-c-2	Accelerate retrofitting of privately-owned unreinforced masonry structures that have not been retrofitted, for example, by (a) actively working with owners to obtain structural analyses of their buildings, (b) helping owners obtain retrofit funding, (c) adopting a mandatory (rather than voluntary) retrofit program, and/or (d) applying penalties to owners who show inadequate efforts to upgrade these buildings.	Existing Underfunded	CEDA/Building Services
ECON-c-3	Require private owners to inform all existing tenants (and prospective tenants prior to signing a lease agreement) that they work in an unreinforced masonry building and the standard to which it may have been retrofitted.	Existing Underfunded	
ECON-c-4	As required by State law, require private owners to inform all existing tenants that they may need to be prepared to work elsewhere following an earthquake even if the building has been retrofitted, because it has probably been retrofitted to a life-safety standard, not to a standard that will allow occupancy following major earthquakes.	Existing Underfunded	
Economy: Privately-Owned Structurally Vulnerable Buildings			
ECON-d-1	Inventory non-ductile concrete, tilt-up concrete, and other privately-owned structurally vulnerable buildings.	Existing Underfunded	CEDA/Building Services
ECON-d-2	Adopt the 2009 International Existing Building Code or the latest applicable standard for the design of voluntary or mandatory retrofit of privately-owned seismically vulnerable buildings.	Existing	CEDA/Building Services

City of Oakland
Annex to Local Hazard Mitigation Plan

Number	Specific Mitigation Strategy	Oakland Priority	Responsible Agencies
ECON-d-3	Adopt one or more of the following strategies as incentives to encourage retrofitting of privately-owned seismically vulnerable commercial and industrial buildings: (a) waivers or reductions of permit fees, (b) below-market loans, (c) local tax breaks, (d) grants to cover the cost of retrofitting or of a structural analysis, (e) land use (such as parking requirement waivers) and procedural incentives, or (f) technical assistance.	Existing Underfunded	CEDA/Building Services; Planning and Zoning
Economy: Wildfire and Structural Fires			
ECON-e-1	Increase efforts to reduce hazards in existing private development in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat through improving engineering design and vegetation management for mitigation, appropriate code enforcement, and public education on defensible space mitigation strategies.	Existing	Oakland Fire Department
ECON-e-2	Tie public education on defensible space and a comprehensive defensible space ordinance to a field program of enforcement.	Existing	Oakland Fire Department
ECON-e-3	Require that new privately-owned business and office buildings in high fire hazard areas be constructed of fire-resistant building materials and incorporate fire-resistant design features (such as minimal use of eaves, internal corners, and open first floors) to increase structural survivability and reduce ignitability.	Existing	Oakland Fire Department
ECON-e-4	Adopt and amend as needed updated versions of the California Building and Fire Codes so that optimal fire-protection standards are used in construction and renovation projects of private buildings.	Existing	Oakland Fire Department
ECON-e-5	Create a mechanism to enforce provisions of the California Building and Fire Codes and other local codes that require the installation of smoke detectors and fire-extinguishing systems on existing privately-owned buildings by making installation a condition of (a) finalizing a permit for any work valued at over a fixed amount and/or (b) on any building over 75 feet in height, and/or (b) as a condition for the transfer of property.	Existing	Oakland Fire Department
ECON-e-6	Expand vegetation management programs in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat to more effectively manage the fuel load through roadside collection and chipping, mechanical fuel reduction equipment, selected harvesting, use of goats or other organic methods of fuel reduction, and selected use of controlled burning.	Existing Underfunded	Oakland Fire Department
ECON-e-7	Establish special funding mechanisms (such as Fire Hazard Abatement Districts or regional bond funding) to fund reduction in fire risk of existing properties through vegetation management that includes reduction of fuel loads, use of defensible space, and fuel breaks.	Existing Underfunded	Oakland Fire Department

City of Oakland
Annex to Local Hazard Mitigation Plan

Number	Specific Mitigation Strategy	Oakland Priority	Responsible Agencies
ECON-e-8	Establish special funding mechanisms (such as Fire Hazard Abatement Districts or regional bond funding) to fund fire-safety inspections of private properties, roving firefighter patrols on high fire-hazard days, and public education efforts.	Existing Underfunded	Oakland Fire Department
ECON-e-9	Compile a list of privately-owned high-rise and high-occupancy buildings that are deemed, due to their age or construction materials, to be particularly susceptible to fire hazards, and determine an expeditious timeline for the fire-safety inspection of all such structures.	Existing	Oakland Fire Department
ECON-e-10	Conduct periodic fire-safety inspections of all privately-owned commercial and industrial buildings.	Existing	Oakland Fire Department
ECON-e-11	Work with the State Fire Marshall, the California Seismic Safety Commission, Pacific Earthquake Engineering Research Center (PEER), and other experts to identify and manage gas-related fire risks of privately-owned soft-story mixed use buildings that are prone to collapse and occupant entrapment consistent with the natural gas safety recommendations of Seismic Safety Commission Report SSC-02-03. Note - See http://www.seismic.ca.gov/pub/CSSC_2002-03_Natural%20Gas%20Safety.pdf . Also note - any valves that are installed may need to have both excess flow and seismic triggers (hybrid valves).	Moderate	Oakland Fire Department
ECON-e-12	Ensure that city/county-initiated fire-preventive vegetation-management techniques and practices for creek sides and high-slope areas do not contribute to the landslide and erosion hazard.	Existing	Oakland Fire Department
ECON-e-13	Work with insurance companies to create a public/private partnership to give a discount on fire insurance premiums to Forester Certified Fire Wise landscaping and fire-resistant building materials on private property.	Existing Underfunded	Oakland Fire Department
Economy: Flooding			
ECON-f-1	To reduce flood risk, thereby reducing the cost of flood insurance to private property owners, work to qualify for the highest-feasible rating under the Community Rating System of the National Flood Insurance Program.	Moderate	CEDA/Building Services
ECON-f-2	Balance the needs for private commercial and industrial development against the risk from potential flood-related hazards.	Existing	CEDA
ECON-f-3	Ensure that new private development pays its fair share of improvements to the storm drainage system necessary to accommodate increased flows from the development, or does not increase runoff by draining water to pervious areas or detention facilities.	Existing	PWA
ECON-f-4	Provide sandbags and plastic sheeting to private businesses in anticipation of rainstorms, and deliver those materials to vulnerable populations upon request.	Existing	PWA

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Number	Specific Mitigation Strategy	Oakland Priority	Responsible Agencies
ECON-f-5	Provide information to private business on locations for obtaining sandbags and deliver those sandbags to those various locations throughout a city and/or county.	Existing	PWA
ECON-f-6	Apply floodplain management regulations for private development in the floodplain and floodway.	Existing	CEDA/PWA
ECON-f-7	Encourage private business owners to participate in building elevation programs within flood hazard areas.	Existing	
ECON-f-8	As funding becomes available, encourage private business owners to participate in acquisition and relocation programs for areas within floodways.	Moderate	
ECON-f-9	Require an annual inspection of approved flood-proofed privately-owned buildings to ensure that (a) all flood-proofing components will operate properly under flood conditions and (b) all responsible personnel are aware of their duties and responsibilities as described in their building's Flood Emergency Operation Plan and Inspection & Maintenance Plan.	Existing	CEDA
Economy: Landslides and Erosion			
ECON-g-1	Increase efforts to reduce landslides and erosion in existing and future development by improving appropriate code enforcement and use of applicable standards for private property, such as those appearing in the California Building Code, California Geological Survey Special Report 117 – Guidelines for Evaluating and Mitigating Seismic Hazards in California, American Society of Civil Engineers (ASCE) report Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Landslide Hazards in California, and the California Board for Geologists and Geophysicists Guidelines for Engineering Geologic Reports. Such standards should cover excavation, fill placement, cut-fill transitions, slope stability, drainage and erosion control, slope setbacks, expansive soils, collapsible soils, environmental issues, geological and geotechnical investigations, grading plans and specifications, protection of adjacent properties, and review and permit issuance.	Existing	CEDA
ECON-g-2	Increase efforts to reduce landslides and erosion in existing and future private development through continuing education of design professionals on mitigation strategies.	Existing Underfunded	CEDA
Economy: Construction			
ECON-h-1	Continue to require that all new privately-owned commercial and industrial buildings be constructed in compliance with requirements of the most recently adopted version of the California Building Code.	Existing	CEDA
ECON-h-2	Conduct appropriate employee training and support continued education to ensure enforcement of construction standards for private development.	Existing	CEDA

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Number	Specific Mitigation Strategy	Oakland Priority	Responsible Agencies
ECON-h-3	Work with private building owners to help them recognize that many strategies that increase earthquake resistance also decrease damage in an explosion. In addition, recognize that ventilation systems can be designed to contain airborne biological agents.	Existing Underfunded	Oakland Fire Department
Economy: Building Reoccupancy			
ECON-i-1	Institute a program to encourage owners of private buildings to participate in a program similar to San Francisco’s Building Occupancy Resumption Program (BORP). This program permits owners of private buildings to hire qualified structural engineers to create building-specific post-disaster inspection plans and allows these engineers to become automatically deputized as City/County inspectors for these buildings in the event of an earthquake or other disaster.	Existing Underfunded	CEDA
ECON-i-2	Actively notify private owners of historic or architecturally significant buildings of the availability of the local BORP-type program and encourage them to participate to ensure that appropriately qualified structural engineers are inspecting their buildings, thus reducing the likelihood that the buildings will be inappropriately evaluated following a disaster.	Existing Underfunded	CEDA
ECON-i-3	Actively notify owners of educational facility buildings of the availability of the local BORP-type program and encourage them to participate to ensure that appropriately qualified structural engineers are inspecting their buildings, thus reducing the likelihood that the buildings will be inappropriately evaluated following a disaster.	Existing Underfunded	CEDA
ECON-i-4	Allow private building owners to participate in a BORP-type program as described above, but not actively encourage them to do so.	Existing Underfunded	CEDA
ECON-i-5	Develop and enforce a repair and reconstruction ordinance to ensure that damaged buildings are repaired in an appropriate and timely manner and retrofitted concurrently. This repair and reconstruction ordinance should apply to all public and private buildings, and also apply to repair of all damage, regardless of cause. See http://quake.abag.ca.gov/recovery/info-repair-ord.html .	Moderate	CEDA
ECON-i-6	Establish preservation-sensitive measures for the repair and reoccupancy of historically significant privately-owned structures, including requirements for temporary shoring or stabilization where needed, arrangements for consulting with preservationists, and expedited permit procedures for suitable repair or rebuilding of historically or architecturally valuable structures.	Existing Underfunded	CEDA

Number	Specific Mitigation Strategy	Oakland Priority	Responsible Agencies
Economy: Public Education			
ECON-j-1	Provide information to private business owners and their employees on the availability of interactive hazard maps on ABAG's web site.	Existing Underfunded	CEDA/ Oakland Fire Department (OES)
ECON-j-2	Develop printed materials, utilize existing materials (such as developed by FEMA and the American Red Cross), conduct workshops, and/or provide outreach encouraging private businesses' employees to have family disaster plans that include drop-cover-hold earthquake drills, fire and storm evacuation procedures, and shelter-in-place emergency guidelines.	Existing Underfunded	CEDA/ Oakland Fire Department (OES)
ECON-j-3	Develop and print materials, conduct workshops, and provide outreach to Bay Area private businesses focusing on business continuity planning.	Existing Underfunded	CEDA/ Oakland Fire Department (OES)
ECON-j-4	Inform Bay Area private business owners of mitigation activities, including elevation of appliances above expected flood levels, use of fire-resistant roofing and defensible space in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat, structural retrofitting techniques for older buildings, and use of intelligent grading practices through workshops, publications, and media announcements and events.	Existing Underfunded	CEDA/ Oakland Fire Department (OES)
ECON-j-5	Sponsor the formation and training of Community Emergency Response Teams (CERT) training for other than your own employees through partnerships with local private businesses. [Note – these programs go by a variety of names in various cities and areas.]	Existing Underfunded	Oakland Fire Department/OES
ECON-j-6	Assist private businesses in the development of defensible space through the use of, for example, "tool libraries" for weed abatement tools, roadside collection and/or chipping services (for brush, weeds, and tree branches) in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat.	Existing Underfunded	Oakland Fire Department (OES)/Library
ECON-j-7	Make use of the materials developed by others (such as found on ABAG's web site at http://quake.abag.ca.gov/business) to increase mitigation activities related to earthquakes by groups other than your own agency. ABAG plans to continue to improve the quality of those materials over time.	Existing	Oakland Fire Department/OES
ECON-j-8	Develop a "Maintain-a-Drain" campaign, similar to that of the City of Oakland, encouraging private businesses and residents to keep storm drains in their neighborhood free of debris.	Existing	PWA

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Number	Specific Mitigation Strategy	Oakland Priority	Responsible Agencies
ECON-j-9	Encourage the formation of a community- and neighborhood-based approach to wildfire education and action through local Fire Safe Councils and the Fire Wise Program. This effort is important because grant funds are currently available to offset costs of specific council-supported projects.	Existing Underfunded	Oakland Fire Department
ECON-j-10	Encourage private businesses and laboratories handling hazardous materials or pathogens increase security to a level high enough to create a deterrent to crime and terrorism, including active implementation of “cradle-to-grave” tracking systems.	Existing Underfunded	Oakland Fire Department
ECON-j-11	Encourage joint meetings of security and operations personnel at major private employers to develop innovative ways for these personnel to work together to increase safety and security.	Existing Underfunded	Oakland Fire Department/OES
ECON-j-12	Inform private shoreline-property owners of the possible long-term economic threat posed by rising sea levels.	Under Study	CEDA
ECON-j-13	Distribute appropriate materials related to disaster mitigation and preparedness to private business owners. Appropriate materials are (1) culturally appropriate and (2) suitable for special needs populations. For example, such materials are available on the http://www.preparesnow.org website and from non-governmental organizations that work with these communities on an on-going basis.	Existing	Oakland Fire Department/OES
Education: Focus on Critical Facilities			
EDUC-a-1	Assess the vulnerability of critical public education facilities to damage in natural disasters and make recommendations for appropriate mitigation.	Not applicable for a city	State Architect
EDUC-a-2	Retrofit or replace critical public education facilities that are shown to be vulnerable to damage in natural disasters.	Not applicable for a city	State Architect
EDUC-a-3	Conduct comprehensive programs to identify and mitigate problems with facility contents, architectural components, and equipment that will prevent critical public education buildings from being functional after major disasters.	Not applicable for a city	State Architect
EDUC-a-4	As a secondary focus, assess the vulnerability of non-critical educational facilities (that is, those that do not house students) to damage in natural disasters based on occupancy and structural type, make recommendations on priorities for structural improvements or occupancy reductions, and identify potential funding mechanisms.	Not applicable for a city	State Architect
EDUC-a-5	Assess the vulnerability of critical private education, pre-school, and day care facilities to damage in natural disasters and make recommendations for appropriate mitigation.	Not applicable for a city	State Architect

Number	Specific Mitigation Strategy	Oakland Priority	Responsible Agencies
EDUC-a-6	Work with CalEMA and the Division of the State Architect to ensure that there will be an adequate group of Safety Assessment Program (SAP) inspectors trained and deployed by CalEMA to schools for post-disaster inspection. In addition, if a school district is uncomfortable with delays in inspection due to too few SAP inspectors available in catastrophic disasters, formalized arrangements can also be created with those inspectors certified by the Division of the State Architect as construction inspectors to report to the district, assess damage, and determine if the buildings can be reoccupied.	Not applicable for a city	State Architect
Education: Use of Educational Facilities as Emergency Shelters			
EDUC-b-1	Work cooperatively with the American Red Cross, cities, counties, and non-profits to set up memoranda of understanding for use of education facilities as emergency shelters following disasters.	Not applicable for a city	OUSD
EDUC-b-2	Work cooperatively to ensure that school district personnel and relevant staff understand and are trained that being designated by the American Red Cross or others as a potential emergency shelter does NOT mean that the school has had a hazard or structural evaluation to ensure that it can be used as a shelter following any specific disaster.	Not applicable for a city	OUSD
EDUC-b-3	Work cooperatively to ensure that school district personnel understand and are trained that they are designated as disaster service workers and must remain at the school until released.	Not applicable for a city	OUSD
Education: Actions Related to Disaster Preparedness and Recovery Planning			
EDUC-c-1	Encourage employees of schools to have family disaster plans and conduct mitigation activities in their own homes.	Not applicable for a city	OUSD
EDUC-c-2	Develop plans, in conjunction with fire jurisdictions, for evacuation or sheltering in place of school children during periods of high fire danger, thereby recognizing that overloading of streets near schools by parents attempting to pick up their children during these periods can restrict access by fire personnel and equipment.	Not applicable for a city	OUSD
EDUC-c-3	Offer the 20-hour basic CERT training to teachers and after-school personnel.	Not applicable for a city	OUSD/OES
EDUC-c-4	Offer the 20-hour basic Student Emergency Response Training (SERT, rather than CERT) training to middle school and/or high school students as a part of the basic science or civics curriculum, as an after school club, or as a way to earn public service hours.	Not applicable for a city	OUSD/OES

Number	Specific Mitigation Strategy	Oakland Priority	Responsible Agencies
EDUC-c-5	Offer the 20-hour basic CERT training course through the Adult School system and/or through the Community College system (either using instructors with teaching credentials or by making facilities available for classes not run by school personnel themselves).	Not applicable for a city	OUSD/OES
EDUC-c-6	Develop and maintain the capacity for schools to take care of the students for the first 48 hours after a disaster, and notify parents that this capacity exists.	Not applicable for a city	OUSD
EDUC-c-7	Develop a continuity of operations and disaster recovery plan using models such as that developed by the University of California Berkeley. (The American Red Cross has a role in promoting this activity, as well, in schools that they plan to use as shelters.)	Not applicable for a city	OUSD
Education: Use of Schools as Conduits for Information to Families About Emergencies			
EDUC-d-1	Utilize the unique ability of schools to reach families through educational materials on hazards, mitigation, and preparedness, particularly after disasters and at the beginning of the school year. These efforts will not only make the entire community more disaster-resistant, but speed the return of schools from use as shelters to use as teaching facilities, particularly if coordinated with cities, counties, the American Red Cross and others.	Not applicable for a city	OUSD/OES
EDUC-d-2	Develop and distribute culturally appropriate materials related to disaster mitigation and preparedness, such as those on the http://www.preparenow.org website.	Not applicable for a city	OES
Environment: Environmental Sustainability and Pollution Reduction			
ENVI-a-1	Continue to enforce State-mandated requirements, such as the California Environmental Quality Act, to ensure that mitigation activities for hazards, such as seismic retrofits and vegetation clearance programs for fire threat, are conducted in a way that reduces environmental degradation such as air quality impacts, noise during construction, and loss of sensitive habitats and species, while respecting the community value of historic preservation.	Existing	CEDA, PWA
ENVI-a-2	Encourage regulatory agencies to work collaboratively with safety professionals to develop creative mitigation strategies that effectively balance environmental and safety needs, particularly to meet critical wildfire, flood, and earthquake safety levels.	Existing	
ENVI-a-3	Continue to enforce and/or comply with State-mandated requirements, such as the California Environmental Quality Act and environmental regulations to ensure that urban development is conducted in a way to minimize air pollution. For example, air pollution levels can lead to global warming, and then to drought, increased vegetation susceptibility to disease (such as pine bark beetle infestations), and associated increased fire hazard.	Existing	CEDA

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Number	Specific Mitigation Strategy	Oakland Priority	Responsible Agencies
ENVI-a-4	Develop and implement a comprehensive program for watershed management optimizing ecosystem health with water yield to balance water supply, flooding, fire, and erosion concerns.	Under Study	
ENVI-a-5	Balance the need for the smooth flow of storm waters versus the need to maintain wildlife habitat by developing and implementing a comprehensive Streambed Vegetation Management Plan that ensures the efficacy of flood control efforts, mitigates wildfires and maintains the viability of living rivers.	Existing	PWA
ENVI-a-6	Comply with applicable performance standards of any National Pollutant Discharge Elimination System municipal stormwater permit that seeks to manage increases in stormwater run-off flows from new development and redevelopment construction projects.	Existing	PWA
ENVI-a-7	Enforce and/or comply with the grading, erosion, and sedimentation requirements by prohibiting the discharge of concentrated stormwater flows by other than approved methods that seek to minimize associated pollution.	Existing	CEDA, PWA
ENVI-a-8	Explore ways to require that hazardous materials stored in the flood zone be elevated or otherwise protected from flood waters.	Existing	Oakland Fire Department
ENVI-a-9	Enforce and/or comply with the hazardous materials requirements of the State of California Certified Unified Program Agency (CUPA).	Existing	Oakland Fire Department
ENVI-a-10	Provide information on hazardous waste disposal and/or drop off locations.	Existing	PWA/Environmental Services
ENVI-a-11	When remodeling existing government and infrastructure buildings and facilities, remove asbestos to speed up clean up of buildings so that they can be reoccupied more quickly.	Under Study	
ENVI-a-12	Develop and implement a program to control invasive and exotic species that contribute to fire and flooding hazards (such as eucalyptus, cattails, and cordgrass). This program could include vegetation removal, thinning, or replacement in hazard areas where there is a direct threat to structures.	Existing Underfunded	
ENVI-a-13	Enforce provisions under creek protection, stormwater management, and discharge control ordinances designed to keep watercourses free of obstructions and to protect drainage facilities to conform with the Regional Water Quality Control Board's Best Management Practices.	Existing Underfunded	PWA

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Environment: Climate Change

ENVI-b-1	Stay informed of scientific information compiled by regional and state sources on the subject of rising sea levels and global warming, especially on additional actions that local governments can take to mitigate this hazard including special design and engineering of government-owned facilities in low-lying areas, such as wastewater treatment plants, ports, and airports.	Existing	PWA/Environmental Services
ENVI-b-2	Inventory global warming emissions in your own local government's operations and in the community, set reduction targets and create an action plan.	Existing	PWA/Environmental Services
ENVI-b-3	Adopt and enforce land-use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities.	Existing Underfunded	CEDA/Strategic Planning
ENVI-b-4	Promote transportation options such as bicycle trails, commute trip reduction programs, incentives for car pooling and public transit.	Existing Underfunded	CEDA/PWA (Transportation Services)
ENVI-b-5	Increase the use of clean, alternative energy by, for example, investing in "green tags", advocating for the development of renewable energy resources, recovering landfill methane for energy production, and supporting the use of waste to energy technology.	Existing Underfunded	
ENVI-b-6	Make energy efficiency a priority through building code improvements, retrofitting city facilities with energy efficient lighting and urging employees to conserve energy and save money.	Existing Underfunded	CEDA
ENVI-b-7	Purchase only Energy Star equipment and appliances for local government use.	Existing Underfunded	City Administrator
ENVI-b-8	Practice and promote sustainable building practices using the U.S. Green Building Council's LEED program or a similar system.	Existing Underfunded	CEDA
ENVI-b-9	Increase the average fuel efficiency of municipal fleet vehicles; reduce the number of vehicles; launch an employee education program including anti-idling messages; convert diesel vehicles to bio-diesel.	Existing Underfunded	PWA
ENVI-b-10	Evaluate opportunities to increase pump efficiency in water and wastewater systems; recover wastewater treatment methane for energy production.	Existing Underfunded	
ENVI-b-11	Increase recycling rates in local government operations and in the community.	Existing	PWA (Environmental Services)
ENVI-b-12	Maintain healthy urban forests; promote tree planting to increase shading and to absorb CO2.	Existing Underfunded	PWA

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ENVI-b-13	Help educate the public, schools, other jurisdictions, professional associations, business and industry about reducing global warming pollution.	Existing Underfunded	
Environment: Agricultural and Aquaculture Resilience			
ENVI-c-1	Maintain a variety of crops in rural areas of the region to increase agricultural diversity and crop resiliency. RESPONSIBLE AGENCIES: County Offices of the Agricultural Commissioner.	Not applicable	
ENVI-c-2	Promote and maintain the public-private partnerships dedicated to preventing the introduction of agricultural pests into regionally-significant crops, such as the glassy-winged sharpshooter into vineyards. RESPONSIBLE AGENCIES: County Offices of the Agricultural Commissioner.	Not applicable	
ENVI-c-3	Encourage livestock operators to develop an early-warning system to detect animals with communicable diseases (due to natural causes or bioterrorism). RESPONSIBLE AGENCIES: County Health Department and Office of the County Agricultural Commissioner.	Not applicable	
Government: Focus on Critical Facilities			
GOVT-a-1	Assess the vulnerability of critical facilities (such as city halls, fire stations, operations and communications headquarters, community service centers, seaports, and airports) to damage in natural disasters and make recommendations for appropriate mitigation.	Existing Underfunded	PWA/Oakland Fire Department (OES)
GOVT-a-2	Retrofit or replace critical facilities that are shown to be vulnerable to damage in natural disasters.	Existing Underfunded	PWA/Oakland Fire Department (OES)
GOVT-a-3	Clarify to workers in critical facilities and emergency personnel, as well as to elected officials and the public, the extent to which the facilities are expected to perform only at a life safety level (allowing for the safe evacuation of personnel) or are expected to remain functional following an earthquake.	Existing	PWA/Oakland Fire Department (OES)
GOVT-a-4	Conduct comprehensive programs to identify and mitigate problems with facility contents, architectural components, and equipment that will prevent critical buildings from being functional after major natural disasters. Such contents and equipment includes computers and servers, phones, files, and other tools used by staff to conduct daily business.	Existing Underfunded	PWA/Oakland Fire Department (OES)
GOVT-a-5	Encourage joint meetings of security and operations personnel at critical facilities to develop innovative ways for these personnel to work together to increase safety and security.	Existing	PWA/Oakland Fire Department (OES)
GOVT-a-6	When installing micro and/or surveillance cameras around critical public assets tied to web-based software, and developing a surveillance protocol to monitor these cameras, investigate the possibility of using the cameras for the secondary purpose of post-disaster damage assessment.	Moderate	PWA/Oakland Fire Department (OES)

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GOVT-a-7	Identify and undertake cost-effective retrofit measures related to security on critical facilities (such as moving and redesigning air intake vents and installing blast-resistant features) when these buildings undergo major renovations related to other natural hazards.	Moderate	PWA/Oakland Fire Department (OES)
GOVT-a-8	Coordinate with the State Division of Safety of Dams to ensure that cities and counties are aware of the timeline for the maintenance and inspection of dams whose failure would impact their jurisdiction.	NYC	Oakland Fire Department (OES)
GOVT-a-9	As a secondary focus, assess the vulnerability of non-critical facilities to damage in natural disasters based on occupancy and structural type, make recommendations on priorities for structural improvements or occupancy reductions, and identify potential funding mechanisms.	Moderate	PWA/Oakland Fire Department (OES)
GOVT-a-10	Ensure that new government-owned facilities comply with and are subject to the same or more stringent regulations as imposed on privately-owned development.	Existing	PWA/Oakland Fire Department (OES)
GOVT-a-11	Comply with all applicable building and fire codes, as well as other regulations (such as state requirements for fault, landslide, and liquefaction investigations in particular mapped areas) when constructing or significantly remodeling government-owned facilities.	Existing	PWA/Oakland Fire Department (OES)
GOVT-a-12	Prior to acquisition of property to be used as a critical facility, conduct a study to ensure the absence of significant structural hazards and hazards associated with the building site.	Existing	PWA/Oakland Fire Department (OES)
GOVT-a-13	Ensure that any regulations imposed on private-owned businesses related to repair and reconstruction (see Economy Section) are enforced and imposed on local government's own buildings and structures.	Existing	PWA/CEDA
Government: Maintain and Enhance Local Government's Emergency Recovery Planning			
GOVT-b-1	Establish a framework and process for pre-event planning for post-event recovery that specifies roles, priorities, and responsibilities of various departments within the local government organization, and that outlines a structure and process for policy-making involving elected officials and appointed advisory committees.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-b-2	Prepare a basic Recovery Plan that outlines the major issues and tasks that are likely to be the key elements of community recovery, as well as integrate this planning into response planning (such as with continuity of operations plans).	Existing Underfunded	Oakland Fire Department (OES)
GOVT-b-3	Establish a goal for the resumption of local government services that may vary from function to function.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-b-4	Develop a continuity of operations plan that includes back-up storage of vital records, such as plans and back-up procedures to pay employees and vendors if normal finance department operations are disrupted, as well as other essential electronic files.	Existing Underfunded	Oakland Fire Department (OES)

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GOVT-b-5	Plan for the emergency relocation of government-owned facilities critical to recovery, as well as any facilities with known structural deficiencies or in hazardous areas.	Existing Underfunded	Oakland Fire Department (OES)
Government: Maintain and Enhance Local Government's Emergency Response Capability			
GOVT-c-1	Develop a plan for short-term and intermediate-term sheltering of your employees.	Moderate	Oakland Fire Department (OES)
GOVT-c-2	Encourage your employees to have a family disaster plan.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-c-3	Offer CERT/NERT-type training to your employees.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-c-4	Periodically assess the need for new or relocated fire or police stations and other emergency facilities.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-c-5	Periodically assess the need for changes in staffing levels, as well as for additional or updated supplies, equipment, technologies, and in-service training classes.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-c-6	Ensure that fire, police, and other emergency personnel have adequate radios, breathing apparatuses, protective gear, and other equipment to respond to a major disaster.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-c-7	Participate in developing and maintaining a system of interoperable communications for first responders from cities, counties, special districts, state, and federal agencies.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-c-8	Harden emergency response communications, including, for example, building redundant capacity into public safety alerting and/or answering points, replacing or hardening microwave and simulcast systems, adding digital encryption for programmable radios, and ensuring a plug-and-play capability for amateur radio.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-c-9	Purchase command vehicles for use as mobile command/EOC vehicles if current vehicles are unsuitable or inadequate.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-c-10	Maintain the local government's emergency operations center in a fully functional state of readiness.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-c-11	Expand or participate in expanding traditional disaster exercises involving city and county emergency personnel to include airport and port personnel, transit and infrastructure providers, hospitals, schools, park districts, and major employers.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-c-12	Maintain and update as necessary the local government's Standardized Emergency Management System (SEMS) Plan and the National Incident Management System (NIMS) Plan, and submit an appropriate NIMSCAST report.	Existing	Oakland Fire Department (OES)
GOVT-c-13	Continue to participate not only in general mutual-aid agreements, but also in agreements with adjoining jurisdictions for cooperative response to fires, floods, earthquakes, and other disasters.	Existing	Oakland Fire Department (OES)

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GOVT-c-14	Install alert and warning systems for rapid evacuation or shelter-in-place. Such systems include outdoor sirens and/or reverse-911 calling systems.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-c-15	Conduct periodic tests of the alerting and warning system.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-c-16	Regulate and enforce the location and design of street-address numbers on buildings and minimize the naming of short streets (that are actually driveways) to single homes.	Existing	CEDA/Building Services
GOVT-c-17	Monitor weather during times of high fire risk using, for example, weather stations tied into police and fire dispatch centers.	Existing	
GOVT-c-18	Establish regional protocols on how to respond to the NOAA Monterey weather forecasts, such as the identifying types of closures, limits on work that could cause ignitions, and prepositioning of suppression forces. A multi-agency coordination of response also helps provide unified messages to the public about how they should respond to these periods of increased fire danger. Response should also be modified based on knowledge of local micro-climates. Local agencies with less risk then may be available for mutual aid.	Existing	
GOVT-c-19	Increase local patrolling during periods of high fire weather.	Existing Underfunded	Oakland Fire Department
GOVT-c-20	Create and maintain an automated system of rain and flood gauges that is web enabled and publicly-accessible. Work toward creating a coordinated regional system.	Existing Underfunded	
GOVT-c-21	Place remote sensors in strategic locations for early warning of hazmat releases or use of weapons of mass destruction, understanding that the appropriate early warning strategy depends on the type of problem.	Existing Underfunded	
GOVT-c-22	Review and update, as necessary, procedures pursuant to the State Dam Safety Act for the emergency evacuation of areas located below major water-storage facilities.	NYC	
GOVT-c-23	Improve coordination among cities, counties, and dam owners so that cities and counties can better plan for evacuation of areas that could be inundated if a dam failed, impacting their jurisdiction.	Moderate	
GOVT-c-24	Develop procedures for the emergency evacuation of areas identified on tsunami evacuation maps as these maps become available.	Existing Underfunded	
GOVT-c-25	Support and encourage planning and identification of facilities for the coordination of distribution of water, food, blankets, and other supplies, coordinating this effort with the American Red Cross.	Existing Underfunded	Oakland Fire Department (OES)
Government: Participate in National, State, Multi-Jurisdictional and Professional Society Efforts to Identify and Mitigate Hazards			
GOVT-d-1	Promote information sharing among overlapping and neighboring local governments, including cities, counties, and special districts, as well as utilities.	Existing Underfunded	Oakland Fire Department (OES)

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GOVT-d-2	Recognize that emergency services is more than the coordination of police and fire response; it also includes planning activities with providers of water, food, energy, transportation, financial, information, and public health services.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-d-3	Recognize that a multi-agency approach is needed to mitigate flooding by having flood control districts, cities, counties, and utilities meet at least annually to jointly discuss their capital improvement programs for most effectively reducing the threat of flooding. Work toward making this process more formal to insure that flooding is considered at existing joint-agency meetings.	High	
GOVT-d-4	As new flood-control projects are completed, request that FEMA revise its flood-insurance rate maps and digital Geographic Information System (GIS) data to reflect flood risks as accurately as possible.	Existing Underfunded	
GOVT-d-5	Participate in FEMA's National Flood Insurance Program.	Existing	CEDA/Building Services
GOVT-d-6	Participate in multi-agency efforts to mitigate fire threat, such as the Hills Emergency Forum (in the East Bay), various FireSafe Council programs, and city-utility task forces. Such participation increases a jurisdiction's competitiveness in obtaining grants.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-d-7	Work with major employers and agencies that handle hazardous materials to coordinate mitigation efforts for the possible release of these materials due to a natural disaster such as an earthquake, flood, fire, or landslide.	Existing Underfunded	Oakland Fire Department
GOVT-d-8	Encourage staff to participate in efforts by professional organizations to mitigate earthquake and landslide disaster losses, such as the efforts of the Northern California Chapter of the Earthquake Engineering Research Institute, the East Bay-Peninsula Chapter of the International Code Council, the Structural Engineers Association of Northern California, and the American Society of Grading Officials.	Existing	Oakland Fire Department (OES)
GOVT-d-9	Conduct and/or promote attendance at local or regional hazard conferences and workshops for elected officials and staff to educate them on the critical need for programs in mitigating earthquake, wildfire, flood, and landslide hazards.	Existing Underfunded	Oakland Fire Department (OES)
GOVT-d-10	Cooperate with researchers working on government-funded projects to refine information on hazards, for example, by expediting the permit and approval process for installation of seismic arrays, gravity survey instruments, borehole drilling, fault trenching, landslide mapping, flood modeling, and/or damage data collection.	Existing	Oakland Fire Department (OES)

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Government: Take a Lead in Loss and Risk Assessment Activities

GOVT-e-1	Work with the cities, counties, and special districts in the Bay Area to encourage them to adopt a Local Hazard Mitigation Plan and to assist them in integrating it into their overall planning process. RESPONSIBILITY: ABAG only; all others are "not applicable."	Not applicable for a city—ABAG jurisdiction
GOVT-e-2	Improve the risk assessment and loss estimation work in the Taming Natural Disasters report and multi-jurisdictional plan related to natural disasters. RESPONSIBILITY: ABAG only; all others are "not applicable."	Not applicable for a city—ABAG jurisdiction

Health: Hospitals and Other Critical Health Care Facilities

HEAL-a-1	Work to ensure that cities, counties, county health departments, and hospital operators coordinate with each other (and that hospitals cooperate with the California Office of Statewide Health Planning and Development - OSHPD) to comply with current state law that mandates that critical facilities are structurally sound and have nonstructural systems designed to remain functional following disasters by 2013. In particular, this coordination should include understanding any problems with obtaining needed funding. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals	Existing Underfunded
HEAL-a-2	Encourage hospitals in your community to work with OSHPD to formalize arrangements with structural engineers to report to the hospital, assess damage, and determine if the buildings can be reoccupied. The program should be similar to San Francisco’s Building Occupancy Resumption Program (BORP) that permits owners of buildings to hire qualified structural engineers to create building-specific post-disaster inspection plans and allows these engineers to become automatically deputized as inspectors for these buildings in the event of an earthquake or other disaster. OSHPD, rather than city/county building departments, has the authority and responsibility for the structural integrity of hospital structures. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals	Existing Underfunded
HEAL-a-3	Ensure health care facilities are adequately prepared to care for victims with respiratory problems related to smoke and/or particulate matter inhalation. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals	Existing Underfunded
HEAL-a-4	Ensure these health care facilities have the capacity to shut off outside air and be self-contained. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals	Existing Underfunded
HEAL-a-5	Ensure that hospitals and other major health care facilities have auxiliary water and power sources. RESPONSIBLE AGENCIES: Cities, counties, county health departments, water suppliers, and hospitals	Existing Underfunded

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HEAL-a-6	Work to ensure that county health departments work with health care facilities to institute isolation capacity should a need for them arise following a communicable disease epidemic. Isolation capacity varies from a section of the hospital for most communicable diseases to the entire hospital for a major pandemic flu. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals	Existing Underfunded	
HEAL-a-7	Develop printed materials, utilize existing materials (such as developed by FEMA, the American Red Cross, and others, including non-profit organizations), conduct workshops, and/or provide outreach encouraging employees of these critical health care facilities to have family disaster plans and conduct mitigation activities in their own homes. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals	Existing Underfunded	
Health: Ancillary Health-Related Facilities			
HEAL-b-1	Identify these ancillary facilities in your community. These facilities are not regulated by OSHPD in the same way as hospitals. RESPONSIBLE AGENCIES: Cities, counties, and county health departments	Existing Underfunded	
HEAL-b-2	Encourage these facility operators to develop disaster mitigation plans. RESPONSIBLE AGENCIES: Cities, counties, and county health departments	Existing Underfunded	
HEAL-b-3	Encourage these facility operators to create, maintain, and/or continue partnerships with local governments to develop response and business continuity plans for recovery. RESPONSIBLE AGENCIES: Cities, counties, and county health departments	Existing Underfunded	
Health: Coordination Initiatives			
HEAL-c-1	Designate locations for the distribution of antibiotics to large numbers of people should the need arise, as required to be included in each county's Strategic National Stockpile Plan. RESPONSIBLE AGENCIES: County Health Departments	N/A	
HEAL-c-2	Ensure that you know the Metropolitan Medical Response System (MMRS) cities in your area. Fremont, Oakland, San Francisco, and San Jose (plus Sacramento and Stockton) are the MMRS cities in or near the Bay Area. MMRS cities are provided with additional federal funds for organizing, equipping, and training groups of local fire, rescue, medical, and other emergency management personnel to respond to a mass casualty event. (The coordination among public health, medical, emergency management, coroner, EMS, fire, and law enforcement is a model for all cities and counties.) RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals	Existing Underfunded	Oakland Fire Department (OES)

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HEAL-c-3	Know that National Disaster Medical System (NDMS) uniformed or non-uniformed personnel are within one-to-four hours of your community. These federal resources include veterinary, mortuary, and medical personnel. Teams in or near the Bay Area are headquartered in the cities of Santa Clara and Sacramento. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals	Not Yet Considered	
HEAL-c-4	Plan for hazmat related-issues due to a natural or technological disaster. Hazmat teams should utilize the State of California Department of Health Services laboratory in Richmond for confirmation of biological agents and Lawrence Livermore National Laboratory or Sandia (both in Livermore) for confirmation of radiological agents. RESPONSIBLE AGENCIES: Cities, counties, county health departments, and hospitals.	Existing Underfunded	
HEAL-c-5	Create discussion forums for food and health personnel (including, for example, medical professionals, veterinarians, and plant pathologists) to develop safety, security, and response strategies for food supply contamination (at the source, in processing facilities, in distribution centers, and in grocery stores). RESPONSIBLE AGENCIES: County environmental health departments	Not applicable	
HEAL-c-6	Ensure mental health continuity of operations and disaster planning is coordinated among county departments, (including Public Health and Emergency Services), private sector mental health organizations, professional associations, and national and community-based non-profit agencies involved in supporting community mental health programs. First, such planning should ensure that the capability exists to provide both immediate on-site mental health support at facilities such as evacuation centers, emergency shelters, and local assistance centers, as well as to coordinate on-going mental health support during the long-term recovery process. Second, this planning should ensure that mental health providers, in collaboration with the county agencies responsible for providing public information, are prepared to provide consistent post-disaster stress and other mental health guidance to the public impacted by the disaster.	Not Applicable	
Housing: Multi-Hazard			
HSNG-a-1	Assist in ensuring adequate hazard disclosure by working with real estate agents to improve enforcement of real estate disclosure requirements for residential properties with regard to seven official natural hazard zones: 1) Special Flood Hazard Areas (designated by FEMA), 2) Areas of Potential Flooding from dam failure inundation, 3) Very High Fire Hazard Severity Zones, 4) Wildland Fire Zones, 5) Earthquake Fault Zones (designated under the Alquist-Priolo Earthquake Fault Zoning Act), and the 6) Liquefaction and Landslide Hazard Zones (designated under the Seismic Hazard Mapping Act).	Not Yet Considered	CEDA

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HSNG-a-2	Create incentives for private owners of historic or architecturally significant residential buildings to undertake mitigation to levels that will minimize the likelihood that these buildings will need to be demolished after a disaster, particularly if those alterations conform to the federal Secretary of the Interior’s Guidelines for Rehabilitation.	Existing Underfunded	CEDA
HSNG-a-3	Develop a plan for short-term sheltering of residents of your community in conjunction with the American Red Cross.	Existing	Oakland Fire Department (OES)
HSNG-a-4	Develop a plan for interim housing for those displaced by working with the Regional Catastrophic Planning Grant Program (CPGP) that funded this effort in 2009. (Estimated completion is 2011.)	Existing	Oakland Fire Department (OES)
Housing: Single-Family Homes Vulnerable to Earthquakes			
HSNG-b-1	Utilize or recommend adoption of a retrofit standard that includes standard plan sets and construction details for voluntary bolting of homes to their foundations and bracing of outside walls of crawl spaces (“cripple” walls), such as Plan Set A developed by a committee representing the East Bay-Peninsula-Monterey Chapters of the International Code Council (ICC), California Building Officials (CALBO), the Structural Engineers Association of Northern California (SEAONC), the Northern California Chapter of the Earthquake Engineering Research Institute (EERI-NC), and ABAG’s Earthquake Program.	Existing Underfunded	CEDA
HSNG-b-2	Require engineered plan sets for seismic retrofitting of heavy two-story homes with living areas over garages, as well as for split level homes (that is, homes not covered by Plan Set A), until standard plan sets and construction details become available.	Existing	CEDA
HSNG-b-3	Require engineered plan sets for seismic retrofitting of homes on steep hillsides (because these homes are not covered by Plan Set A).	Existing	CEDA
HSNG-b-4	Encourage local government building inspectors to take classes on a periodic basis (such as the FEMA-developed training classes offered by ABAG) on retrofitting of single-family homes, including application of Plan Set A.	Existing	CEDA
HSNG-b-5	Encourage private retrofit contractors and home inspectors doing work in your area to take retrofit classes on a periodic basis (such as the FEMA-developed training classes offered by ABAG or additional classes that might be offered by the CALBO Training Institute) on retrofitting of single-family homes.	Existing Underfunded	CEDA
HSNG-b-6	Conduct demonstration projects on common existing housing types demonstrating structural and nonstructural mitigation techniques as community models for earthquake mitigation.	Not Yet Considered	CEDA

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HSNG-b-7	Provide retrofit classes or workshops for homeowners in your community, or help promote utilization of subregional workshops in the South Bay, East Bay, Peninsula, and North Bay as such workshops become available through outreach using existing community education programs.	Moderate	CEDA
HSNG-b-8	Establish tool-lending libraries with common tools needed for retrofitting for use by homeowners with appropriate training.	Existing	CEDA/Library
HSNG-b-9	Provide financial incentives to owners of single-family homes to retrofit if those retrofits comply with Plan Set A or IEBC 2006 in addition to that provided by existing State law that makes such retrofits exempt from increases in property taxes.	Existing Underfunded	CEDA
Housing: Soft-Story Multi-Family Residential Structures Vulnerable to Earthquakes			
HSNG-c-1	Require engineered plan sets for voluntary or mandatory soft-story seismic retrofits by private owners until a standard plan set and construction details become available.	Existing	CEDA
HSNG-c-2	Adopt the 2009 International Existing Building Code or the latest applicable standard for the design of voluntary or mandatory soft-story building retrofits for use in city/county building department regulations. In addition, allow use of changes to that standard recommended by SEAOC for the 2012 IEBC.	Existing	CEDA
HSNG-c-3	Work to educate building owners, local government staff, engineers, and contractors on privately-owned soft-story retrofit procedures and incentives using materials such as those developed by ABAG and the City of San Jose (see http://quake.abag.ca.gov/eqhouse.html .)	Moderate	CEDA
HSNG-c-4	Conduct an inventory of privately-owned existing or suspected soft-story residential structures as a first step in establishing voluntary or mandatory programs for retrofitting these buildings.	Existing Underfunded	CEDA
HSNG-c-5	Use the soft-story inventory to require private owners to inform all existing tenants (and prospective tenants prior to signing a lease agreement) that they may live in this type of building.	Moderate	CEDA
HSNG-c-6	Use the soft-story inventory to require private owners to inform all existing and prospective tenants that they may need to be prepared to live elsewhere following an earthquake if the building has not been retrofitted.	Moderate	CEDA
HSNG-c-7	Investigate and adopt appropriate financial, procedural, and land use incentives (such as parking waivers) for private owners of soft-story buildings to facilitate retrofit such as those described by ABAG (see http://quake.abag.ca.gov/fixit/).	Moderate	CEDA
HSNG-c-8	Explore development of State regulations or legislation to require or encourage private owners of soft-story structures to strengthen them.	Moderate	CEDA

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HSNG-c-9	Provide technical assistance in seismically strengthening privately-owned soft-story structures.	Under Study	CEDA
Housing: Unreinforced Masonry Housing Stock			
HSNG-d-1	Continue to actively implement existing State law that requires cities and counties to maintain lists of the addresses of unreinforced masonry buildings and inform private property owners that they own this type of hazardous structure.	Existing	CEDA
HSNG-d-2	Accelerate retrofitting of privately-owned unreinforced masonry structures that have not been retrofitted, for example, by (a) actively working with owners to obtain structural analyses of their buildings, (b) helping owners obtain retrofit funding, (c) adopting a mandatory versus voluntary, retrofit program, and/or (d) applying penalties to owners who show inadequate efforts to upgrade these buildings.	Existing Underfunded	CEDA
HSNG-d-3	Require private owners to inform all existing tenants (and prospective tenants prior to signing a lease agreement) that they live in an unreinforced masonry building and the standard to which it may have been retrofitted.	Existing Underfunded	
HSNG-d-4	As required by State law, require private owners to inform all existing tenants that they may need to be prepared to live elsewhere following an earthquake even if the building has been retrofitted, because it has probably been retrofitted to a life-safety standard, not to a standard that will allow occupancy following major earthquakes.	Existing	
Housing: Other Privately-Owned Structurally Vulnerable Residential Buildings and Earthquakes			
HSNG-e-1	Identify and work toward tying down mobile homes used as year-round permanent residences using an appropriate cost-sharing basis (for example, 75% grant, 25% owner).	Existing Underfunded	OES
HSNG-e-2	Inventory non-ductile concrete, tilt-up concrete (such as converted lofts), and other privately-owned potentially structurally vulnerable residential buildings.	Existing Underfunded	CEDA
HSNG-e-3	Adopt the 2009 International Existing Building Code or the latest applicable standard for the design of voluntary or mandatory retrofit of privately-owned seismically vulnerable buildings.	Existing	CEDA
HSNG-e-4	Adopt one or more of the following strategies as incentives to encourage retrofitting of privately-owned seismically vulnerable residential buildings: (a) waivers or reductions of permit fees, (b) below-market loans, (c) local tax breaks, (d) grants to cover the cost of retrofitting or of a structural analysis, (e) land use (such as parking requirement waivers) and procedural incentives, or (f) technical assistance.	Existing Underfunded	CEDA
Housing: New Construction and Earthquakes			
HSNG-f-1	Continue to require that all new housing be constructed in compliance with requirements of the most recently adopted version of the California Building Code.	Existing	CEDA

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HSNG-f-2	Conduct appropriate employee training and support continued education to ensure enforcement of building codes and construction standards, as well as identification of typical design inadequacies of housing and recommended improvements.	Existing	CEDA
Housing: Wildfire and Structural Fires			
HSNG-g-1	Increase efforts to reduce hazards in existing private development in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat through improving engineering design and vegetation management for mitigation, appropriate code enforcement, and public education on defensible space mitigation strategies.	Existing	Oakland Fire Department
HSNG-g-2	Tie public education on defensible space and a comprehensive defensible space ordinance to a field program of enforcement.	Existing	
HSNG-g-3	Require that new homes in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat be constructed of fire-resistant building materials (including roofing and exterior walls) and incorporate fire-resistant design features (such as minimal use of eaves, internal corners, and open first floors) to increase structural survivability and reduce ignitability. Note - See Structural Fire Prevention Field Guide for Mitigation of Wildfires at http://osfm.fire.ca.gov/structural.html .	Existing	CEDA
HSNG-g-4	Create or identify “model” properties showing defensible space and structural survivability in neighborhoods that are wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat.	Moderate	
HSNG-g-5	Consider fire safety, evacuation, and emergency vehicle access when reviewing proposals to add secondary units or additional residential units in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat.	Existing	CEDA
HSNG-g-6	Adopt and amend as needed updated versions of the California Building and Fire Codes so that optimal fire-protection standards are used in construction and renovation projects of private buildings.	Existing	CEDA
HSNG-g-7	Create a mechanism to enforce provisions of the California Building and Fire Codes and other local codes that require the installation of smoke detectors and fire-extinguishing systems on existing residential buildings by making installation a condition of (a) finalizing a permit for any work valued at over a fixed amount and/or (b) on any building over 75 feet in height, and/or (b) as a condition for the transfer of property.	Existing	CEDA
HSNG-g-8	Work to ensure a reliable source of water for fire suppression in rural-residential areas through the cooperative efforts of water districts, fire districts, and residents.	n/a	

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HSNG-g-9	Expand vegetation management programs in wildland-urban- interface fire-threatened communities or in areas exposed to high-to-extreme fire threat to more effectively manage the fuel load through roadside collection and chipping, mechanical fuel reduction equipment, selected harvesting, use of goats or other organic methods of fuel reduction, and selected use of controlled burning.	Existing Underfunded	Oakland Fire Department
HSNG-g-10	Establish special funding mechanisms (such as Fire Hazard Abatement Districts or regional bond funding) to fund reduction in fire risk of existing properties through vegetation management that includes reduction of fuel loads, use of defensible space, and fuel breaks.	Existing Underfunded	Oakland Fire Department
HSNG-g-11	Work with residents in rural-residential areas to ensure adequate plans are developed for appropriate access and evacuation in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat. For example, in some areas, additional roads can be created, and in other areas, the communities will need to focus on early warning and evacuation because additional roads are not feasible.	Existing Underfunded	Oakland Fire Department
HSNG-g-12	Require fire sprinklers in new homes located more than 1.5 miles or a 5-minute response time from a fire station or in an identified high hazard wildland-urban-interface wildfire area.	Existing	Oakland Fire Department
HSNG-g-13	Require fire sprinklers in all new or substantially remodeled multifamily housing, regardless of distance from a fire station.	Existing	Oakland Fire Department
HSNG-g-14	Require sprinklers in all mixed use development to protect residential uses from fires started in non-residential areas.	Existing	Oakland Fire Department
HSNG-g-15	Compile a list of privately-owned high-rise and high-occupancy buildings which are deemed, due to their age or construction materials, to be particularly susceptible to fire hazards, and determine an expeditious timeline for the fire-safety inspection of all such structures.	Existing	Oakland Fire Department
HSNG-g-16	Conduct periodic fire-safety inspections of all multi-family buildings, as required by State law.	Existing	Oakland Fire Department
HSNG-g-17	Ensure that city/county-initiated fire-preventive vegetation-management techniques and practices for creek sides and high-slope areas do not contribute to the landslide and erosion hazard. For example, vegetation in these sensitive areas could be thinned, rather than removed, or replanted with less flammable materials. When thinning, the non-native species should be removed first. Other options would be to use structural mitigation, rather than vegetation management in the most sensitive areas.	Existing Underfunded	Oakland Fire Department

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HSNG-g-18	Create a mechanism to require the bracing of water heaters and flexible couplings on gas appliances, and/or (as specified under "b. Single-family homes vulnerable to earthquakes" above) the bolting of homes to their foundations and strengthening of cripple walls to reduce fire ignitions due to earthquakes.	Existing	CEDa
HSNG-g-19	Work with the State Fire Marshall, the California Seismic Safety Commission, Pacific Earthquake Engineering Research Center (PEER), and other experts to identify and manage gas-related fire risks of soft-story residential or mixed use buildings that are prone to collapse and occupant entrapment consistent with the natural gas safety recommendations of Seismic Safety Commission Report SSC-02-03. Note - See http://www.seismic.ca.gov/pub/CSSC_2002-03_Natural%20Gas%20Safety.pdf . Also note - any valves that are installed may need to have both excess flow and seismic triggers (hybrid valves).	Moderate	Oakland Fire Department
HSNG-g-20	Work with insurance companies to create a public/private partnership to give a discount on fire insurance premiums to Forester Certified Fire Wise landscaping and fire-resistant building materials on private property.	Existing Underfunded	Oakland Fire Department
Housing: Flooding			
HSNG-h-1	To reduce flood risk, thereby reducing the cost of flood insurance to private property owners, work to qualify for the highest-feasible rating under the Community Rating System of the National Flood Insurance Program.	Moderate	
HSNG-h-2	Balance the housing needs of residents against the risk from potential flood-related hazards.	Existing	
HSNG-h-3	Ensure that new private development pays its fair share of improvements to the storm drainage system necessary to accommodate increased flows from the development, or does not increase runoff by draining water to pervious areas or detention facilities.	Existing	PWA
HSNG-h-4	Provide sandbags and plastic sheeting to residents in anticipation of rainstorms, and deliver those materials to vulnerable populations upon request.	Existing Underfunded	PWA
HSNG-h-5	Provide public information on locations for obtaining sandbags and/or deliver those sandbags to those various locations throughout a city and/or county prior to and/or during the rainy season.	Existing Underfunded	PWA/OES
HSNG-h-6	Apply floodplain management regulations for private development in the floodplain and floodway.	Existing	CEDA/PWA
HSNG-h-7	Ensure that new subdivisions are designed to reduce or eliminate flood damage by requiring lots and rights-of-way be laid out for the provision of approved sewer and drainage facilities, providing on-site detention facilities whenever practicable.	Existing	CEDA/PWA

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HSNG-h-8	Encourage home and apartment owners to participate in home elevation programs within flood hazard areas.	Existing	
HSNG-h-9	As funding opportunities become available, encourage home and apartment owners to participate in acquisition and relocation programs for areas within floodways.	Moderate	
HSNG-h-10	Encourage owners of properties in a floodplain to consider purchasing flood insurance. For example, point out that most homeowners' insurance policies do not cover a property for flood damage.	Existing	
Housing: Landslides and Erosion			
HSNG-i-1	Increase efforts to reduce landslides and erosion in existing and future development by improving appropriate code enforcement and use of applicable standards for private property, such as those appearing in the California Building Code, California Geological Survey Special Report 117 – Guidelines for Evaluating and Mitigating Seismic Hazards in California, American Society of Civil Engineers (ASCE) report Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Landslide Hazards in California, and the California Board for Geologists and Geophysicists Guidelines for Engineering Geologic Reports. Such standards should cover excavation, fill placement, cut-fill transitions, slope stability, drainage and erosion control, slope setbacks, expansive soils, collapsible soils, environmental issues, geological and geotechnical investigations, grading plans and specifications, protection of adjacent properties, and review and permit issuance.	Existing	CEDA
HSNG-i-2	Increase efforts to reduce landslides and erosion in existing and future private development through continuing education of design professionals on mitigation strategies.	Existing Underfunded	
Housing: Building Reoccupancy			
HSNG-j-1	Develop and enforce a repair and reconstruction ordinance to ensure that damaged buildings are repaired in an appropriate and timely manner and retrofitted concurrently. This repair and reconstruction ordinance should apply to all public and private buildings, and also apply to repair of all damage, regardless of cause. See http://quake.abag.ca.gov/recovery/info-repair-ord.html .	Existing	CEDA
HSNG-j-2	Establish preservation-sensitive measures for the repair and reoccupancy of historically significant privately-owned structures, including requirements for temporary shoring or stabilization where needed, arrangements for consulting with preservationists, and expedited permit procedures for suitable repair or rebuilding of historically or architecturally valuable structures.	Existing Underfunded	CEDA

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Housing: Public Education

HSNG-k-1	Provide information to residents of your community on the availability of interactive hazard maps showing your community on ABAG's web site.	Existing	OES
HSNG-k-2	Develop printed materials, utilize existing materials (such as developed by FEMA and the American Red Cross), conduct workshops, and/or provide outreach encouraging residents to have family disaster plans that include drop-cover-hold earthquake drills, fire and storm evacuation procedures, and shelter-in-place emergency guidelines.	Existing Underfunded	Oakland Fire Department (OES)
HSNG-k-3	Inform residents of comprehensive mitigation activities, including elevation of appliances above expected flood levels, use of fire-resistant roofing and defensible space in high wildfire threat and wildfire-urban-interface areas, structural retrofitting techniques for older homes, and use of intelligent grading practices through workshops, publications, and media announcements and events.	Existing Underfunded	Oakland Fire Department (OES)
HSNG-k-4	Develop a public education campaign on the cost, risk, and benefits of earthquake, flood, and other hazard insurance as compared to mitigation.	Moderate	Oakland Fire Department (OES)
HSNG-k-5	Use disaster anniversaries, such as April (the 1906 earthquake), September (9/11), and October (Loma Prieta earthquake and Oakland Hills fire), to remind the public of safety and security mitigation activities.	Existing	Oakland Fire Department (OES)
HSNG-k-6	Sponsor the formation and training of Community Emergency Response Teams (CERT) for residents in your community. [Note – these programs go by a variety of names in various cities and areas.]	Existing Underfunded	Oakland Fire Department (OES)
HSNG-k-7	Include flood fighting technique session based on California Department of Water Resources training to the list of available public training classes offered by CERT.	Existing Underfunded	Oakland Fire Department (OES)
HSNG-k-8	Institute the neighborhood watch block captain and team programs outlined in the Citizen Corps program guide.	Existing Underfunded	Oakland Fire Department (OES)
HSNG-k-9	Assist residents in the development of defensible space through the use of, for example, "tool libraries" for weed abatement tools, roadside collection and/or chipping services (for brush, weeds, and tree branches) in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat.	Existing Underfunded	Oakland Fire Department (OES)/ Library
HSNG-k-10	Train homeowners to locate and shut off gas valves if they smell or hear gas leaking.	Existing Underfunded	Oakland Fire Department (OES)
HSNG-k-11	Develop a program to provide at-cost NOAA weather radios to residents of flood hazard areas that request them, with priority to neighborhood watch captains and others trained in their use.	Moderate	

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HSNG-k-12	Make use of the materials on the ABAG web site at http://quake.abag.ca.gov/fixit and other web sites to increase residential mitigation activities related to earthquakes. (ABAG plans to continue to improve the quality of those materials over time.)	Existing	Oakland Fire Department (OES)
HSNG-k-13	Develop a “Maintain-a-Drain” campaign, similar to that of the City of Oakland, encouraging private businesses and residents to keep storm drains in their neighborhood free of debris.	Existing	PWA
HSNG-k-14	Encourage the formation of a community- and neighborhood-based approach to wildfire education and action through local Fire Safe Councils and the Fire Wise Program. This effort is important because grant funds are currently available to offset costs of specific council-supported projects.	Existing Underfunded	Oakland Fire Department
HSNG-k-15	Inform shoreline-property owners of the possible long-term economic threat posed by rising sea levels.	Under Study	
HSNG-k-16	Distribute appropriate materials related to disaster mitigation and preparedness to residents. Appropriate materials are (1) culturally appropriate and (2) suitable for special needs populations. For example, such materials are available on the http://www.preparenow.org website and from non-governmental organizations that work with these communities on an on-going basis.	Existing Underfunded	Oakland Fire Department (OES)
Infrastructure: Multi-Hazard			
INFR-a-1	Assess the vulnerability of critical facilities owned by infrastructure operators subject to damage in natural disasters or security threats, including fuel tanks and facilities owned outside of the Bay Area that can impact service delivery within the region. Note - Infrastructure agencies, departments, and districts are those that operate transportation and utility facilities and networks.	Not Applicable	PWA
INFR-a-2	If a dam owner, comply with State of California and federal requirements to assess the vulnerability of dams to damage from earthquakes, seiches, landslides, liquefaction, or security threats.	Not Applicable	
INFR-a-3	Encourage the cooperation of utility system providers and cities, counties, and special districts, and PG&E to develop strong and effective mitigation strategies for infrastructure systems and facilities.	Existing	PWA/OES
INFR-a-4	Retrofit or replace critical lifeline facilities and/or their backup facilities that are shown to be vulnerable to damage in natural disasters.	Existing Underfunded	PWA/OES
INFR-a-5	Support and encourage efforts of other (lifeline infrastructure) agencies as they plan for and arrange financing for seismic retrofits and other disaster mitigation strategies. (For example, a city might pass a resolution in support of a transit agency’s retrofit program.)	Existing	PWA/OES

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INFR-a-6	Develop a plan for speeding the repair and functional restoration of water and wastewater systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies, such as those available through the Water /Wastewater Agency Response Network (WARN). Communicate that plan to local governments and critical facility operators.	Existing	
INFR-a-7	Engage in, support, and/or encourage research by others (such as USGS, universities, or Pacific Earthquake Engineering Research Center-PEER) on measures to further strengthen transportation, water, sewer, and power systems so that they are less vulnerable to damage in disasters.	Existing	
INFR-a-8	Pre-position emergency power generation capacity (or have rental/lease agreements for these generators) in critical buildings of cities, counties, and special districts to maintain continuity of government and services.	Existing Underfunded	Oakland Fire Department (OES)
INFR-a-9	Ensure that critical intersection traffic lights function following loss of power by installing battery back-ups, emergency generators, or lights powered by alternative energy sources such as solar. Proper functioning of these lights is essential for rapid evacuation, such as with hazmat releases resulting from natural disasters.	Existing Underfunded	PWA
INFR-a-10	Develop unused or new pedestrian rights-of-way as walkways to serve as additional evacuation routes (such as fire roads in park lands).	Existing Underfunded	Oakland Fire Department
INFR-a-11	Minimize the likelihood that power interruptions will adversely impact lifeline utility systems or critical facilities by ensuring that they have adequate back-up power.	Existing Underfunded	
INFR-a-12	Encourage replacing above ground electric and phone wires and other structures with underground facilities, and use the planning-approval process to ensure that all new phone and electrical utility lines are installed underground.	Existing Underfunded	
INFR-a-13	If you own a dam, coordinate with the State Division of Safety of Dams to ensure an adequate timeline for the maintenance and inspection of dams, as required of dam owners by State law, and communicate this information to local governments and the public.	Not Applicable	
INFR-a-14	Encourage communication between State Emergency Management Agency (CalEMA), FEMA, and utilities related to emergencies occurring outside of the Bay Area that can affect service delivery in the region.	Existing	Oakland Fire Department (OES)
INFR-a-15	Ensure that transit operators, private ambulance companies, cities, and/or counties have mechanisms in place for medical transport during and after disasters that take into consideration the potential for reduced capabilities of roads following these same disasters.	Existing Underfunded	Oakland Fire Department (OES)

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INFR-a-16	Recognize that heat emergencies produce the need for non-medical transport of people to cooling centers by ensuring that (1) transit operators have plans for non-medical transport of people during and after such emergencies including the use of paratransit and (2) cities, counties, and transit agencies have developed ways to communicate the plan to the public.	Existing Underfunded	Oakland Fire Department (OES)
INFR-a-17	Effectively utilize the Regional Transportation Management Center (TMC) in Oakland, the staffing of which is provided by Caltrans, the CHP and MTC. The TMC is designed to maximize safety and efficiency throughout the highway system. It includes the Emergency Resource Center (ERC) which was created specifically for primary planning and procedural disaster management. RESPONSIBLE AGENCY: MTC only.	Not applicable	Oakland Fire Department (OES)
INFR-a-18	Develop (with the participation of paratransit providers, emergency responders, and public health professionals) plans and procedures for paratransit system response and recovery from disasters.	Existing Underfunded	Oakland Fire Department (OES)
INFR-a-19	Coordinate with other critical infrastructure facilities to establish plans for delivery of water and wastewater treatment chemicals.	Existing Underfunded	Oakland Fire Department (OES)
INFR-a-20	Establish plans for delivery of fuel to critical infrastructure providers.	Existing Underfunded	Oakland Fire Department (OES)
INFR-a-21	As an infrastructure operator, designate a back-up Emergency Operations Center with redundant communications systems.	Existing Underfunded	Oakland Fire Department (OES)
INFR-a-22	Monitor scientific studies of the Sacramento-San Joaquin Delta and policy decisions related to the long-term disaster resistance of that Delta system to ensure that decisions are made based on comprehensive analysis and in a scientifically-defensible manner. Levee failure due to earthquakes, flooding, and climate change (including sea level rise and more frequent and more severe flooding) are all of concern. The long-term health of the Delta area is critical to the Bay Area's water supply, is essential for the San Francisco Bay and estuary's environmental health, provides recreation opportunities for Bay Area residents, and provides the long-term sustainability of Delta communities. While only part of the Delta is within the nine Bay Area counties covered by this multi-jurisdictional LHMP, the Delta is tied to the infrastructure, water supply, and economy of the Bay Area.	Existing Underfunded	PWA (Environmental Services)
Infrastructure: Earthquakes			
INFR-b-1	Expedite the funding and retrofit of seismically-deficient city- and county-owned bridges and road structures by working with Caltrans and other appropriate governmental agencies.	Existing Underfunded	PWA
INFR-b-2	Establish a higher priority for funding seismic retrofit of existing transportation and infrastructure systems (such as BART) than for expansion of those systems.	Existing Underfunded --local streets and roads are highest priority.	PWA

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INFR-b-3	Include “areas subject to high ground shaking, earthquake-induced ground failure, and surface fault rupture” in the list of criteria used for determining a replacement schedule for pipelines (along with importance, age, type of construction material, size, condition, and maintenance or repair history).	Existing Underfunded	
INFR-b-4	Install specially-engineered pipelines in areas subject to faulting, liquefaction, earthquake-induced landsliding, or other earthquake hazard.		NYC
INFR-b-5	Replace or retrofit water-retention structures that are determined to be structurally deficient, including levees, dams, reservoirs and tanks.	Not applicable	
INFR-b-6	Install portable facilities (such as hoses, pumps, emergency generators, or other equipment) to allow pipelines to bypass failure zones such as fault rupture areas, areas of liquefaction, and other ground failure areas (using a priority scheme if funds are not available for installation at all needed locations).	Not applicable	
INFR-b-7	Install earthquake-resistant connections when pipes enter and exit bridges and work with bridge owners to encourage retrofit of these structures.	Existing Underfunded	
INFR-b-8	Comply with all applicable building and fire codes, as well as other regulations (such as state requirements for fault, landslide, and liquefaction investigations in particular mapped areas) when constructing or significantly remodeling infrastructure facilities.	Existing	PWA
INFR-b-9	Clarify to workers in critical facilities and emergency personnel, as well as to elected officials and the public, the extent to which the facilities are expected to perform only at a life safety level (allowing for the safe evacuation of personnel) or are expected to remain functional following an earthquake.	Existing	
INFR-b-10	Develop a water-based transportation “system” across the Bay for use in the event of major earthquakes. Implementation of such a system could prove extremely useful in the event of structural failure of either the road-bridge systems or BART and might serve as an adjunct to existing transportation system elements in the movement of large numbers of people and/or goods.	n/a (See San Francisco Bay Area Water Emergency Transportation Authority)	
Infrastructure: Wildfire			
INFR-c-1	Ensure a reliable source of water for fire suppression (meeting acceptable standards for minimum volume and duration of flow) for existing and new development.	Existing Underfunded	Oakland Fire Department
INFR-c-2	Develop a coordinated approach between fire jurisdictions and water supply agencies to identify needed improvements to the water distribution system, initially focusing on areas of highest wildfire hazard (including wildfire threat areas and in wildland-urban-interface areas).	Existing Underfunded	Oakland Fire Department

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INFR-c-3	Develop a defensible space vegetation program that includes the clearing or thinning of (a) non-fire resistive vegetation within 30 feet of access and evacuation roads and routes to critical facilities, or (b) all non-native species (such as eucalyptus and pine, but not necessarily oaks) within 30 feet of access and evacuation roads and routes to critical facilities.	Existing Underfunded	Oakland Fire Department
INFR-c-4	For new development, ensure all dead-end segments of public roads in high hazard areas have at least a "T" intersection turn-around sufficient for typical wildland fire equipment.	Existing	Oakland Fire Department
INFR-c-5	For new development, enforce minimum road width of 20 feet with an additional 10-foot clearance on each shoulder on all driveways and road segments greater than 50 feet in length in wildfire hazard areas.	Existing (note: requirement for a six foot clearance)	CEDA/Oakland Fire Department
INFR-c-6	Require that development in high fire hazard areas provide adequate access roads (with width and vertical clearance that meet the minimum standards of the Fire Code or relevant local ordinance), onsite fire protection systems, evacuation signage, and fire breaks.	Existing Underfunded	CEDA/Oakland Fire Department
INFR-c-7	Ensure adequate fire equipment road or fire road access to developed and open space areas.	Existing Underfunded	CEDA/Oakland Fire Department
INFR-c-8	Maintain fire roads and/or public right-of-way roads and keep them passable at all times.	Existing Underfunded	Oakland Fire Department
Infrastructure: Flooding			
INFR-d-1	Conduct a watershed analysis of runoff and drainage systems to predict areas of insufficient capacity in the storm drain and natural creek system.	Existing Underfunded	PWA
INFR-d-2	Develop procedures for performing a watershed analysis to examine the impact of development on flooding potential downstream, including communities outside of the jurisdiction of proposed projects.	Existing Underfunded	PWA
INFR-d-3	Conduct a watershed analysis at least once every ten years unless there is a major development in the watershed or a major change in the Land Use Element of the General Plan of the cities or counties within the watershed.	Existing Underfunded	PWA
INFR-d-4	Assist, support, and/or encourage the U.S. Army Corp of Engineers, various Flood Control and Water Conservation Districts, and other responsible agencies to locate and maintain funding for the development of flood control projects that have high cost-benefit ratios (such as through the writing of letters of support and/or passing resolutions in support of these efforts).	Existing Underfunded	PWA

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INFR-d-5	Pursue funding for the design and construction of storm drainage projects to protect vulnerable properties, including property acquisitions, upstream storage such as detention basins, and channel widening with the associated right-of-way acquisitions, relocations, and environmental mitigations.	Existing Underfunded	PWA
INFR-d-6	Continue to repair and make structural improvements to storm drains, pipelines, and/or channels to enable them to perform to their design capacity in handling water flows as part of regular maintenance activities. (This strategy has the secondary benefit of addressing fuel, chemical, and cleaning product issues.)	Existing Underfunded	PWA
INFR-d-7	Continue maintenance efforts to keep storm drains and creeks free of obstructions, while retaining vegetation in the channel (as appropriate) to allow for the free flow of water.	Existing Underfunded	PWA
INFR-d-8	Enforce provisions under creek protection, stormwater management, and discharge control ordinances designed to keep watercourses free of obstructions and to protect drainage facilities to conform with the Regional Water Quality Control Board's Best Management Practices.	Existing Underfunded	CEDA/PWA
INFR-d-9	Develop an approach and locations for various watercourse bank protection strategies, including for example, (1) an assessment of banks to inventory areas that appear prone to failure, (2) bank stabilization, including installation of rip rap, or whatever regulatory agencies allow (3) stream bed depth management using dredging, and (4) removal of out-of-date coffer dams in rivers and tributary streams.	Existing Underfunded	PWA
INFR-d-10	Use reservoir sediment or reed removal as one way to increase storage for both flood control and water supply.	Not applicable	
INFR-d-11	Identify critical locally-owned bridges affected by flooding and either elevate them to increase stream flow and maintain critical ingress and egress routes or modify the channel to achieve equivalent objectives.	Existing Underfunded	PWA
INFR-d-12	Provide or support the mechanism to expedite the repair or replacement of levees that are vulnerable to collapse from earthquake-induced shaking or liquefaction, rodents, and other concerns, particularly those protecting critical infrastructure.	Not applicable	
INFR-d-13	Ensure that utility systems in new developments are constructed in ways that reduce or eliminate flood damage.	Existing	PWA
INFR-d-14	Determine whether or not wastewater treatment plants are protected from floods, and if not, investigate the use of flood-control berms to not only protect from stream or river flooding, but also increase plant security.	Not applicable	

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INFR-d-15	Work cooperatively with water agencies, flood control districts, Caltrans, and local transportation agencies to determine appropriate performance criteria for watershed analysis.	Existing Underfunded	PWA
INFR-d-16	Work for better cooperation among the patchwork of agencies managing flood control issues.	Existing Underfunded	
INFR-d-17	Improve monitoring of creek and watercourse flows to predict potential for flooding downstream by working cooperatively with land owners and the cities and counties in the watershed.	Existing Underfunded	
INFR-d-18	Using criteria developed by EPA for asset management, inventory existing assets, the condition of those assets, and improvements needed to protect and maintain those assets. Capture this information in a Geographic Information System (GIS) and use it to select locations for creek monitoring gauges.	Existing Underfunded	
Infrastructure: Landslides			
INFR-e-1	Include “areas subject to ground failure” in the list of criteria used for determining a replacement schedule (along with importance, age, type of construction material, size, condition, and maintenance or repair history) for pipelines.	Existing	PWA
INFR-e-2	Establish requirements in zoning ordinances to address hillside development constraints in areas of steep slopes that are likely to lead to excessive road maintenance or where roads will be difficult to maintain during winter storms due to landsliding.	Existing	CEDA
Infrastructure: Building Reoccupancy			
INFR-f-1	Ensure that critical buildings owned or leased by special districts or private utility companies participate in a program similar to San Francisco’s Building Occupancy Resumption Program (BORP). The BORP program permits owners of buildings to hire qualified engineers to create facility-specific post-disaster inspection plans and allows these engineers to become automatically deputized as City/County inspectors for these buildings in the event of an earthquake or other disaster. This program allows rapid reoccupancy of the buildings. Note - A qualified (deleted structural) engineer is a California licensed engineer with relevant experience.	N/A	
Infrastructure: Public Education			
INFR-g-1	Provide materials to the public related to planning for power outages.	Existing Underfunded	Oakland Fire Department (OES)
INFR-g-2	Provide materials to the public related to family and personal planning for delays due to traffic or road closures, or due to transit system disruption caused by disasters.	Existing Underfunded	Oakland Fire Department (OES)

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INFR-g-3	Provide materials to the public related to coping with reductions in water supply or contamination of that supply BEYOND regulatory notification requirements.	Not Applicable	
INFR-g-4	Provide materials to the public related to coping with disrupted storm drains, sewage lines, and wastewater treatment (such as materials developed by ABAG's Sewer Smart Program).	Existing Underfunded	PWA
INFR-g-5	Facilitate and/or coordinate the distribution of emergency preparedness or mitigation materials that are prepared by others, such as by making the use of the internet or other electronic means, or placing materials on community access channels or in city or utility newsletters, as appropriate.	Existing Underfunded	Oakland Fire Department (OES)
INFR-g-6	Sponsor the formation and training of Community Emergency Response Teams (CERT) for the employees of your agency. [Note – these programs go by a variety of names in various cities and areas.]	Existing Underfunded	Oakland Fire Department (OES)
INFR-g-7	Develop and distribute culturally appropriate materials related to disaster mitigation and preparedness, such as those on the http://www.preparenow.org website related to infrastructure issues.	Existing Underfunded	Oakland Fire Department (OES)
Land Use: Earthquake Hazard Studies for New Private Developments			
LAND-a-1	Enforce and/or comply with the State-mandated requirement that site-specific geologic reports be prepared for development proposals within Alquist-Priolo Earthquake Fault Zones, and restrict the placement of structures for human occupancy. (This Act is intended to deal with the specific hazard of active faults that extend to the earth's surface, creating a surface rupture hazard.)	Existing	
LAND-a-2	Require preparation of site-specific geologic or geotechnical reports for development and redevelopment proposals in areas subject to earthquake-induced landslides or liquefaction as mandated by the State Seismic Hazard Mapping Act in selected portions of the Bay Area where these maps have been completed, and condition project approval on the incorporation of necessary mitigation measures related to site remediation, structure and foundation design, and/or avoidance.	Existing	
LAND-a-3	Recognizing that some faults may be a hazard for surface rupture, even though they do not meet the strict criteria imposed by the Alquist-Priolo Earthquake Fault Zoning Act, identify and require geologic reports in areas adjacent to locally-significant faults.	Existing	
LAND-a-4	Ensure that development proposed near faults with a history of complex surface rupture (multiple traces, warping, thrusting, etc.) has larger setbacks than the minimum fifty feet.	NYC	
LAND-a-5	Consider imposing requirements similar to the Alquist-Priolo Earthquake Fault Zoning Act for structures without human occupancy if these buildings are still essential for the economic recovery of the community or region.	NYC	

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LAND-a-6	Recognizing that the California Geological Survey has not completed earthquake-induced landslide and liquefaction mapping for much of the Bay Area, identify and require geologic reports in areas mapped by others as having significant liquefaction or landslide hazards.	Existing	
LAND-a-7	Support and/or facilitate efforts by the California Geological Survey to complete the earthquake-induced landslide and liquefaction mapping for the Bay Area.	Existing	CEDA
LAND-a-8	Require that local government reviews of geologic and engineering studies are conducted by appropriately trained and credentialed personnel.	Existing	CEDA
Land Use: Wildfire and Structural Fires			
LAND-b-1	Review new development proposals to ensure that they incorporate required and appropriate fire-mitigation measures, including adequate provisions for occupant evacuation and access by emergency response personnel and equipment.	Existing	Oakland Fire Department
LAND-b-2	Develop a clear legislative and regulatory framework at both the state and local levels to manage the wildland-urban-interface consistent with Fire Wise and sustainable community principles.	Existing	Oakland Fire Department
Land Use: Flooding			
LAND-c-1	Establish and enforce requirements for new development so that site-specific designs and source-control techniques are used to manage peak stormwater runoff flows and impacts from increased runoff volumes.	Existing	
LAND-c-2	Incorporate FEMA guidelines and suggested activities into local government plans and procedures for managing flood hazards.	Existing	
LAND-c-3	Provide an institutional mechanism to ensure that development proposals adjacent to floodways and in floodplains are referred to flood control districts and wastewater agencies for review and comment (consistent with the NPDES program).	NYC	CEDA
LAND-c-4	Establish and enforce regulations concerning new construction (and major improvements to existing structures) within flood zones in order to be in compliance with federal requirements and, thus, be a participant in the Community Rating System of the National Flood Insurance Program.	NYC	CEDA
LAND-c-5	Encourage new development near floodways to incorporate a buffer zone or setback from that floodway to allow for changes in stormwater flows in the watershed over time.	NYC	CEDA
LAND-c-6	For purposes of creating an improved hazard mitigation plan for the region as a whole, ABAG, and Bay Area cities and counties, jointly request geographically defined repetitive flooding loss data from FEMA for their own jurisdictions.	High	CEDA/OES

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Number	Specific Mitigation Strategy	Oakland Priority	Responsible Agencies
Land Use: Landslides and Erosion			
LAND-d-1	Establish and enforce provisions (under subdivision ordinances or other means) that geotechnical and soil-hazard investigations be conducted and filed to prevent grading from creating unstable slopes, and that any necessary corrective actions be taken prior to development approval.	Existing	CEDA
LAND-d-2	Require that local government reviews of these investigations are conducted by appropriately trained and credentialed personnel.	Existing	CEDA
LAND-d-3	Establish and enforce grading, erosion, and sedimentation ordinances by requiring, under certain conditions, grading permits and plans to control erosion and sedimentation prior to development approval.	Existing	CEDA
LAND-d-4	Establish and enforce provisions under the creek protection, storm water management, and discharge control ordinances designed to control erosion and sedimentation.	Existing	CEDA/PWA
LAND-d-5	Establish requirements in zoning ordinances to address hillside development constraints, especially in areas of existing landslides.	Existing	CEDA
Land Use: Hillside - Multi-hazard			
LAND-e-1	For new development, require a buffer zone between residential properties and landslide or wildfire hazard areas.	NYC	CEDA
LAND-e-2	Discourage, add additional mitigation strategies, or prevent new construction or major remodels on slopes greater than a set percentage, such as 15%, due to landslide or wildfire hazard concerns.	NYC	CEDA
Land Use: Smart Growth to Revitalize Urban Areas and Promote Sustainability			
LAND-f-1	Prioritize retrofit of infrastructure that serves urban areas (or urban services areas) over constructing new infrastructure to serve outlying areas.	Existing	CEDA/PWA
LAND-f-2	Work to retrofit homes in older urban neighborhoods to provide safe housing close to job centers.	Existing Underfunded	CEDA
LAND-f-3	Work to retrofit older downtown areas and redevelopment districts to protect architectural diversity and promote disaster-resistance.	Existing Underfunded	CEDA
LAND-f-4	Work with non-profits and through other mechanisms to protect as open space those areas susceptible to extreme hazards (such as through land acquisition, zoning, and designation as priority conservation areas).	Existing Underfunded	OPR/CEDA/PWA

Number	Specific Mitigation Strategy	Oakland Priority	Responsible Agencies
LAND-f-5	Strive to provide and preserve existing buffers between development and existing users of large amounts of hazardous materials, such as major industry, due to the potential for catastrophic releases or fires due to an earthquake, accident, or terrorism. (Flooding might also result in release or spread of these materials; however, it is unlikely.) In areas where buffers do not exist or cannot be created, provide alternative mitigation.	Existing	CEDA
Land Use: Hazard Abatement Districts LAND-g-1	Use hazard abatement districts as a funding mechanism to ensure that mitigation strategies are implemented and enforced over time.	Existing Underfunded (see Geologic Hazard Abatement District regulations).	CEDA

Exhibit C - Public Participation

- City of Oakland web site information about LHMP Annex
- Oakland *Tribune* notice from 1/15/12

Exhibit D - Oakland City Council Resolution Draft

**To be included in final version of LHMP.
Resolution not yet legally valid as of 1/20/12.**