Local Hazard Mitigation Plan ANNEX
City of Oakland

Introduction

The City of Oakland is the largest city in Alameda County, California. The City has a population of 399,488 people, based on the 2000 census[1]. It is the eighth most populous city in the State of California. It is also the county seat. It is one of the most ethnically diverse cities in the United States, with each of the four main ethnic/racial groups – blacks, non-Hispanic whites, Hispanics, and Asian/Pacific Islanders – making up more than 15% of the population.

Last year, the City's budget was approximately $387 million. The City employs 2,682 full-time equivalent people. The City provides local police services and local fire services. In addition, the Fire Services Agency receives $1.8 million annually in revenues from the Oakland Wildfire Prevention Assessment District.

The Port of Oakland, which operates the Oakland International Airport, as well as the Port, 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 appointed by the City. The budget for the Port for FY 2004-05 was $259 million.

The Planning Process

This process of preparing this 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 has a Safety Element to its General Plan last updated in 2004 that 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);
- flooding hazards (including storm-induced flooding, tsunamis, seiches, dam failure, and sea-level rise).

In addition, the City routinely enforces the requirements of the California Environmental Quality Act (CEQA) requirements (which, since 1988, have required mitigation for identified natural

[1] For complete Census information on this city, see **http://www.bayareacensus.ca.gov/**.

hazards). The City has been a model of disaster mitigation and was designated as one of the first Disaster Resistant Communities in the United States. Most recently, the Safety Element "Protect Oakland" of the Oakland General Plan won the prestigious 2005 award in "Focused Issue Planning" from the Northern California Section of the American Planning Association (APA).

The City's effort in preparing this annex has focused on reviewing these pre-existing programs and 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 multi-jurisdictional Local Hazard Mitigation Plan for the region. In addition, the Safety Element was completed during the same period when ABAG was working on its initial outline of the multi-jurisdictional LHMP.

The City participated in various ABAG workshops and meetings, including the general "kick-off" meeting and the soft-story charrette. Nancy Nadel, a councilmember, served as chair of the ABAG Earthquake and Hazards Outreach Committee. The Port of Oakland also actively participated in the ABAG Hazards Transportation and Lifelines Review Committee In addition, both the City and the Port provided written and oral comments on the multi-jurisdictional plan. Finally, the City provided information on facilities that are viewed as "critical" to ABAG.

Key City staff and members of related external agencies have met as Oakland's Emergency Management Board (Disaster Council) each quarter for several years. This Board has been meeting since prior to the Loma Prieta earthquake in 1989 and is a model of continued awareness and coordination of disaster activities. Members include representatives of PG&E, the East Bay Municipal Utility District, the East Bay Regional Park District, SBC, and BART. Additionally, all five hospitals in the City participate on this Board. Several of these meetings have related to the development of the most recent version of the Safety Element, as well as coordination with ABAG's activities on the multi-jurisdictional LHMP.

The City has also had additional public outreach meetings that have included public comment. These include the January 22, 2003 and October 20, 2004, Oakland City Planning Commission meetings, as well as the May 13, 2003 and November 16, 2004 City Council meetings. Finally, the Safety Element was available for public comment online for weeks prior to these meetings.

Following meetings of key staff to identify and prioritize DRAFT mitigation strategies appropriate for the City, the strategies were reviewed and approved by the Planning Commission and the City Council. Key staff involved in these meetings included not only department and agency directors, but integrated review by committees within each city agency.

The resolution adopting this annex to ABAG's multi-jurisdictional LHMP was on the City Council agenda January 17, 2006. The mitigation strategies identified in this annex have already been integrated into those contained in the City's Safety Element "Protect Oakland". This has been possible because of the close collaboration between the City of Oakland and ABAG.

Hazard and Risk Assessment

The ABAG multi-jurisdictional Local Hazard Mitigation Plan, to which this is an Annex, 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). These hazards also impact this community.

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 at **http://quake.abag.ca.gov/mitigation/**. In addition, the City has developed unique maps of safety hazards by neighborhood area that overlay the various hazard maps.

Information on disasters declared in Alameda County is at **http://quake.abag.ca.gov/mitigation/disaster-history.html.**

Oakland's two most significant and costly disasters were the Loma Prieta earthquake in October 1989 and the Oakland-Berkeley Tunnel fire in October 1991. Oakland experienced its worst ever flooding conditions during the storm of October 1962. The El Niño storms of January and February 1995 cause extensive flooding and landsliding in the City. Specific information on past disasters and emergencies is contained in the 2004 Safety Element on Oakland's website at **http://www.oaklandnet.com/government/ceda/revised/planningzoning/StrategicPlanningSection/default.html**.

The City examined the hazard exposure of City urban land based on the information on ABAG's website at **http://quake.abag.ca.gov/mitigation/pickdbh2.html**. Of the 33,811 urban acres in the City,

- Earthquake faulting – 1,858 acres are in the Alquist-Priolo Earthquake Fault Study Zone.
- Earthquake shaking – most of the urban acres (33,081) 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 4,586 acres in the Seismic Hazard Mapping Zones for this hazard.
- Earthquake liquefaction – 16,247 acres are in areas of moderate, high, or very high liquefaction susceptibility mapped by the U.S. Geological Survey, while 13,761 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, a Special District of the City of Oakland.
- Flooding – only 663 acres are in the 100-year flood plain, while an additional 1,756 acres are in other flood-prone areas.
- Landslides – 2,335 acres are in areas of existing landslides.

- Wildfires – 2,495 acres are subject to high, very high, or extreme wildfire threat (because of the urban nature of the City), but 19,251 acres are in wildland-urban interface threat areas.
- Dam Inundation – 5,354 acres are subject to dam inundation.
- Drought – all 33,811 acres are subject to drought.

The City also examined the hazard exposure of infrastructure based on the information on ABAG's website at **http://quake.abag.ca.gov/mitigation/pickdbh2.html**. Of the 1,086 miles of roadway in the City,

- Earthquake faulting – 66 miles of roadway are in the Alquist-Priolo Earthquake Fault Study Zone.
- Earthquake shaking – almost all of the miles of roadway (1,078) are in the highest two categories of shaking potential.
- Earthquake-induced landslides – the California Geological Survey has identified 69 miles of roadway in the Seismic Hazard Mapping Zones for this hazard.
- Earthquake liquefaction – 516 miles of roadway are in areas of moderate, high, or very high liquefaction susceptibility mapped by the U.S. Geological Survey, while 422 are in the California Geological Survey's Seismic Hazard Mapping Zones for this hazard.
- Tsunamis – As noted above, while tsunamis may be a hazard in the City of Oakland, the mapping of the inundation area has not been completed at this time. Roads in low-lying areas near the waterfront will be most vulnerable.
- Flooding – 12 miles of roadway are in the 100-year flood plain, while an additional 58 miles are in other flood-prone areas.
- Landslides – 46 miles of roadway are in areas of existing landslides.
- Wildfires – while only 54 miles of roadway are subject to high, very high, or extreme wildfire threat, 560 miles of roads are in wildland-urban interface threat areas.
- Dam Inundation – 179 miles of roadway are in an area subject to dam inundation.
- Drought – is not a hazard for roadways.

Finally, the City examined the hazard exposure of critical health care facilities, schools, and city-owned buildings based on the information on ABAG's website at **http://quake.abag.ca.gov/mitigation/pickcrit.html**. Of the critical facilities in the City,

- Earthquake faulting – no hospitals or other health care facilities, 5 of 133 schools, and only one of 65 critical facility owned by the City are in Alquist-Priolo Study Zone.
- Earthquake shaking – all health care facilities, schools, and critical facilities owned by the City are in the highest two categories of shaking potential.
- Earthquake-induced landslides – no hospitals or other health care facilities, but 124 of 133 schools, and 63 of 65 critical facility owned by the City are in the Seismic Hazard Mapping Zones for this hazard.
- Earthquake liquefaction – 44 critical health care facilities, 61 of 133 schools, and 51 of 65 critical facilities owned by the city are in areas of moderate, high, or very high liquefaction susceptibility. In addition, 27 critical health care facilities, 47 of these

schools, and 42 critical facilities owned by the city are in the Seismic Hazard Mapping Zones for this hazard.

- Tsunamis – While tsunamis may be a hazard in the City of Oakland, including to critical facilities in the Port area, the mapping of the inundation area has not been completed at this time.
- Flooding – Only two critical health care facilities, one school, and no city-owned facilities are in the 100-year flood plain. In addition, five critical health care facilities, seven schools, and four city-owned facilities are in other flood-prone areas.
- Landslides – No critical health care facilities, no schools, and only two city-owned facilities are in areas of existing landslides.
- Wildfires – No critical health care facilities, two schools, and no city-owned facilities are in areas of wildfire threat. However, 34 critical health care facilities, 65 schools, and 28 city-owned facilities are in areas of wildland-urban interface threat.
- Dam Inundation – A total of 22 critical health care facilities, 20 schools, and nine city-owned facilities are in an area subject to dam inundation.
- Drought – Drought will not affect City buildings directly. However, the City does not operate a water-supply distribution system. City water is supplied by the East Bay Municipal Utility District.

There are five repetitive loss properties in the City based on the information at http://quake.abag.ca.gov/mitigation/pickflood.html. Only one of these properties is in the mapped 100-year floodplain, while four are outside of the floodplain. This is because of the susceptibility of the City to mudslides.

The City worked with ABAG during 2005 to improve the risk assessment information being compiled by ABAG by providing any existing City information on unreinforced masonry buildings and soft-story apartments located in the City.

Drought, though a potential problem in the City, is not fully assessed. The City will work with ABAG and various water supply agencies, particularly the East Bay Municipal Utility District, on this issue.

The City plans to work with ABAG to develop specific information about the kind and level of damage to buildings, infrastructure, and critical facilities which might result from any of the hazards previously noted. The ABAG Annex states that ABAG will be doing this work in 2005 through early 2006.

As these impacts are not fully developed, the City has reviewed the hazards identified and ranked the hazards based on past disasters and expected future impacts based on hazard exposure. 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 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.

Mitigation Activities and Priorities

As a participant in the ABAG multi-jurisdictional planning process, City of Oakland staff was one of the principal partners in the development and review of the comprehensive list of mitigation strategies in the overall multi-jurisdictional plan. The mitigation strategies were the subject of numerous meetings, as identified in the Planning Process section above.

The tentative 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 our heritage.

Over time, we are committed to developing better hazard and risk information to use in making those trade-offs. We are not trying to create a disaster-proof region, but a disaster-resistant one. In addition, several of the strategies are existing City programs.

The public was provided with an opportunity to comment on the DRAFT priorities on numerous occasions, as listed in the section on the Planning Process. The final strategies (as shown in the attached Table) have already been incorporated into the City's Safety Element adopted in 2004. Many of the strategies have already been implemented.

The City has retrofitted several critical facilities, including City Hall and seventeen of the twenty-five fire stations for earthquake shaking. If 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, and 2002. The status of the one remaining station is currently under review.

The Plan Maintenance and Update Process

The City's Emergency Management Board, in conjunction with the Fire Services Agency's Homeland Security Director, 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 community, legal changes, notices from ABAG as the lead agency in this process, and other triggers will be used.

Finally, the Annex and Safety Element will be a discussion item on the agenda of the meeting of City's Emergency Management Board at least once a year. At that meeting, the Board members heads will focus on ***evaluating*** the Annex and Safety Element in light of technological and political changes during the past year or other significant events. This group will be responsible for determining if the plan should be updated.

The City of Oakland is committed to reviewing and updating this plan annex at least once every five years, as required by the Disaster Mitigation Act of 2000. The City Homeland Security Director will contact ABAG four years after this plan is approved to ensure that ABAG plans to undertake the plan update process. If so, the City again plans to participate in the multi-jurisdictional plan. If ABAG is unwilling or unable to act as the lead agency in the multi-jurisdictional effort, other agencies will be contacted, including the County's Office of

Emergency Services. Counties should then work together to identify another regional forum for developing a multi-jurisdictional plan.

The ***public*** will continue to be involved whenever the plan is updated, and as appropriate during the monitoring and evaluation process. Prior to adoption of updates, the City will provide the opportunity for the public to comment on the updates. A public notice will be posted prior to the meeting to announce the comment period and meeting logistics.