



Office of the City Manager

WORKSESSION
October 21, 2014

To: Honorable Mayor and Members of the City Council

From:  Christine Daniel, City Manager

Submitted by: Gil Dong, Fire Chief, Fire Department

Subject: Emergency Management: Council Training and Program Highlights

SUMMARY

October 17, 2014 is the 25th anniversary of the magnitude 6.9 Loma Prieta Earthquake. It killed 63 people, injured 3,757, and displaced 12,053. It destroyed more than 1,000 Bay Area homes and businesses, with damage estimates as high as \$10 billion.

Berkeley is exposed to many natural and manmade hazards, and the community places a high value on disaster readiness. This Worksession has two goals: to train Councilmembers and their Standby Officers on their roles and duties as elected officials during disaster response, and to brief Council on the key accomplishments that have made Berkeley a recognized leader in disaster resilience and the path forward.

CURRENT SITUATION AND ITS EFFECTS

City Council Role and Responsibilities

City Council's last Disaster Training Workshop was in April 2006 – A century after the 1906 Great Quake and just months after Hurricane Katrina. The emergency management field has continuously evolved before and since Loma Prieta, but Councilmembers' disaster response duties have remained constant. In a major emergency or disaster, City Councilmembers and their Standby Officers must be ready to convene emergency sessions, to represent the City of Berkeley at the local, state and federal level, and to work with members of the Public Information Officer's team to provide accurate information to the Berkeley community. Staff has created the *Berkeley City Council Disaster Response Quick Reference Guide* (see attachments) to capture key information for Councilmembers and their standby officers.

Key Accomplishments in Disaster Resilience

Disaster resilience is defined as “the ability to bounce back and emerge stronger in the face of shocks and stresses.” In the last 25 years, community members have demonstrated their support for Berkeley's resilience-building activities through over \$600 million in voter-approved tax and bond measures. The table below outlines key measures that Berkeley taxpayers support to make Berkeley a safer place to live, work and play.

Table 1. Key Taxpayer Support of Resilience Efforts

Month/Year	Measure	Title	Impacts
June 1992	A	School Facility Bond	\$158 million for school facility safety and repair, including retrofits
Nov 1992	G	Seismic Safety Bond	\$55 million to retrofit existing fire stations, construct Fire Station 7, construct Public Safety Building
Nov 1996	S	Seismic Safety Bond	\$45 million for seismic retrofit of City buildings, including Civic Center and Main Library
Nov 2000	AA	School Facility Bond	\$116.5 million for school facility safety and repair, including retrofits
Nov 2000	Q	Disaster Fire Protection Bond and Tax	\$9.75 million bond and special tax to purchase above ground water system and construct the Fire Warehouse
Nov 2002	I	Animal Shelter Bond	\$7.2 million to build new animal shelter
Nov 2008	FF	Neighborhood Library Bond	\$26 million to renovate, expand, and make seismic and access improvements at four neighborhood branch libraries
Nov 2008	GG	Fire Protection and Emergency Response and Preparedness Tax	\$3.6 million annually to keep fire stations open and improve emergency medical response and disaster preparedness
Nov 2010	I	School Facilities Bond	\$210 million for school construction and upgrades, including seismic safety improvements and hazardous materials removal

This community support has enabled the City to develop an extensive suite of programs to increase Berkeley's disaster resilience, as is detailed in *Resilience in Berkeley: Highlights from 25 Years of Community Support* (see attachments). Key accomplishments are summarized in the following pages.

Berkeley's Resilience Framework

Berkeley has key plans and policies that establish the goals that guide our community's resilience-building efforts, including the General Plan's Disaster Preparedness and

Safety Element, the Climate Action Plan, the Hazard Mitigation Plan and the Watershed Management Plan.

Because disaster response and recovery will involve the entire Berkeley community, as well as surrounding jurisdictions and all levels of government, the City utilizes strategic partnerships to reduce hazards and prepare for disasters. One new partnership for Berkeley is with The Rockefeller Foundation, which selected Berkeley to participate in the 100 Resilient Cities (100 RC) initiative. Through grant support from 100RC, the City recently appointed a Chief Resilience Officer whose role is to guide and accelerate work that increases community readiness for Berkeley's hazards of concern.

Maintaining Response Readiness

City government uses planning, staff training, exercises and partnerships to develop and maintain the capacity to lead Berkeley's disaster response and recovery efforts. The City's plans have evolved along with the emergency management field. Staff participates in regular internal training and exercises and joint efforts with external partners.

The City has had many opportunities to put this planning and training into practice in real events, including the 2007 Cosco Busan Oil Spill; the 2009-2010 H1N1 Flu Pandemic; the 2011 Haste Street Fire and Stanley Hall Diesel Spill; the 2012 Dwight Way Fire; the 2013 High Winds Event; and the 2014 UC Berkeley Measles Response.

In 2012 Berkeley became a member of the East Bay Regional Communications System, which improved public safety radio communications between fire and police agencies in Contra Costa and Alameda Counties. The Fire Department has updated operational procedures and will ratify new agreements with neighboring fire agencies to provide automatic aid year round. Additionally, amateur radios have been installed at all fire stations and the Public Safety Building as a backup communication system. The City continues to support amateur radio operators through Northern Alameda County Amateur Radio Emergency Services/Radio Amateur Civil Emergency Services (NALCO).

Berkeley has had great success in developing key components of its emergency management programs. Through partnerships with the Red Cross, UC Berkeley, and the Berkeley Unified School District and internal trainings, the City has increased its capacity to care for and shelter displaced community members after disaster. The Public Health Division has strengthened Berkeley's preparedness for and response to public health threats from natural disasters, infectious disease outbreaks, and bioterrorism. The City has also developed a robust toolkit of emergency notification systems to share life safety instructions with the community.

Empowering the Community

The City has numerous programs to empower community members to lead their own disaster readiness and response efforts. The resulting community engagement is cutting-edge, award-winning, and inclusive.

The Fire Department's Community Emergency Response Team (CERT) Program provides a comprehensive structure for community members to learn, practice, and maintain skills and community collaboration for disaster readiness and response. Through the annual Citywide Exercise, the CERT program also provides community members the opportunity to practice the skills they have developed in CERT classes and promotes general disaster preparedness and response concepts to everyone in Berkeley. The 2013 Citywide Exercise had an estimated 2,000 community participants; and the 2014 exercise is scheduled for October 18. In addition to the Citywide Exercise, in 2014 CERT volunteers designed, planned, and implemented the City's first Community Emergency Prep Fair. The Berkeley CERT Fair Planning Team was selected as the recipients of the FEMA Region IX Honorable Mention in the Whole Community category.

The Disaster Cache Program builds on the CERT training to incentivize ongoing community organizing for disaster readiness. To date, the City has awarded 87 caches to neighborhood groups; congregations; and UC Berkeley sororities, fraternities, and co-ops that have undertaken disaster readiness activities. The Dumpster Program dovetails with the Cache Program as an incentive for neighborhoods to stay engaged in ongoing disaster preparedness activities. Neighborhood groups qualify for a free dumpster when they host two organized meetings focused on disaster preparedness with City Fire, Police, and/or Public Health staff.

In 2014, Fire-OES established two new programs to address underserved populations. The Berkeley Emergency Accessible Community Organizations Network (BEACON). BEACON is an information-sharing hub for City government and organizations that represent and serve seniors and people with disabilities both before and after disasters. The Public Health Community Preparedness and Engagement Program hires transitional-age youth interns from underserved neighborhoods and trains them to be "disaster ambassadors." These ambassadors deliver interactive emergency preparedness trainings to their peers and neighbors.

Wildland-Urban Interface Fire

In past 23 years since the Tunnel Fire, Berkeley has reduced its WUI fire vulnerability and developed specialized response capabilities and partnerships to quickly respond to this ever-present threat.

The natural, undeveloped areas to Berkeley's east pose a significant fire hazard to the community. Recognizing this danger, the Berkeley Fire Department has built cooperative relationships for fire response with Fire Departments from Alameda County, Oakland, Moraga-Orinda, East Bay Regional Parks, El Cerrito, Kensington, and Richmond. This cooperation has been aided by the inter-jurisdictional Hills Emergency Forum (HEF), which started after the Tunnel Fire. HEF exists to coordinate information on East Bay Hills fire hazards, and to provide a forum to build interagency consensus.

In addition to collaborating with surrounding response agencies, the City aggressively mitigates Berkeley's own wildland-urban interface (WUI) fire hazard. The City protects

community members, the built environment, and natural resources using development regulations, fire inspections, vegetation management, and improvement of access and egress routes.

Early suppression prevents many WUI fires from growing out of control. Before and since the 1991 Tunnel Fire, the City has increased its response capabilities by building firefighting infrastructure, purchasing equipment, training its staff and coordinating with its partners.

The Fire Department also conducts regular training and drills to keep firefighters ready to respond to a wind-driven WUI fire in the hills, which could transition into a fast-moving urban firestorm in the flatlands. All firefighters are certified in basic wildland firefighting and receive four sessions of wildland training, including fire behavior, structure protection, tactics and off-road driving.

Strengthening Berkeley Building Stock

In earthquakes, buildings are not only vulnerable to ground shaking, but also to ground displacements associated with fault rupture, liquefaction and landslides. For this reason, Berkeley is using a multi-pronged approach to strengthen municipal buildings and work with private building owners needing to retrofit their structures. Berkeley has also begun development of programs to expedite building safety evaluations following earthquakes, enabling response activities and accelerating recovery.

The City has strengthened or rebuilt numerous public buildings with voter-supported local bond measures. Strengthened or rebuilt buildings include City Hall, the Public Safety Building, all fire stations, the fire warehouse, the Main Library and all branch libraries. Many of the City's emergency response and recovery efforts will be operated from these buildings.

Berkeley uses a multi-pronged approach to improve the seismic resilience of the city's privately-held building stock. The City has added more stringent local amendments to the California building code that will save lives in the next catastrophic earthquake, as well as financial incentives and guidance to encourage building owners to retrofit their structures. Berkeley has also begun development of programs to expedite building safety evaluations following earthquakes, to enable response activities and accelerate recovery. Since 2011, City staff has been developing post-earthquake safety assessment inspection protocols to guide staff in performing rapid evaluations of City buildings following a major earthquake. For privately-owned buildings, newly-established Building Occupancy Resumption Program (BORP) will allow participating building owners to use approved engineers to inspect their buildings, reducing inspection delays and increasing access to undamaged buildings.

Unreinforced masonry (URM) buildings are constructed of brick, block, tile, stone, or other types of masonry and have no or inadequate reinforcement to keep them from structural collapse in earthquakes. Since the original inception of Berkeley's URM Safety Program in 1991, over 97 percent of URMs on the City's Hazardous Building

Inventory have been seismically retrofitted, demolished, or demonstrated to have adequate reinforcement.

Soft story buildings can be severely damaged or even collapse, as was evidenced in the 1989 Loma Prieta and 1994 Northridge Earthquakes. While these buildings are present throughout California, Berkeley is one of only three cities addressing the problem with a mandatory retrofit ordinance. As of January, 2014, the City requires owners of soft story buildings with five or more dwelling units to retrofit their buildings by 2018. Of 323 soft story buildings identified, 138 remain to be retrofitted.

Recognizing that natural gas contributes to one-quarter of post-earthquake fires, the City has encouraged building owners to install automatic gas shutoff valves through code amendments, reduced permitting fees, and free automatic earthquake gas shutoff valves through a program expected to launch in late 2014.

Preparing for the Impacts of Climate Change

Our region and our city is experiencing and will increasingly experience the impacts of the changing climate, including rising temperatures, drought, and flooding due to sea-level rise and extreme storms. These impacts affect our natural environment, our built infrastructure, and the health and safety of the people that make up the Berkeley community. Therefore, an important component of Berkeley's preparedness work is taking action now to enable the community to better adapt to the impacts of climate change. The Berkeley Climate Action Plan and the LHMP identify a series of recommendations that advance climate adaptation. The City and its partners in the community and at other agencies are already making important progress. For example:

- Preparing for sea-level rise and associated flooding - The Alameda County Public Works Agency recently enlisted a consultant team to conduct the most granular analysis to date of Berkeley's vulnerability to sea-level rise. A multi-departmental team is reviewing the analysis with the goal of incorporating the best available forecasts into the City's capital improvement and land use decision-making.
- Preparing for drought – Water efficiency and conservation takes on increased urgency in the face of prolonged drought. As well as partnering with East Bay Municipal Utility District to encourage water efficiency in the community, the City government is reducing water use in its own operations. A preliminary assessment of water consumption in City operations for the months of April through June 2014 shows a reduction of approximately 27% over the average of the same months in 2012 and 2013.
- Preparing for increasing temperatures – The scientific community forecasts 6 – 10 additional heat waves per year in Berkeley by 2100. As temperatures increase, increasing local tree cover gains increasing importance. The City has consistent worked to increase street and park tree planting; Berkeley has gained over 4,650 street and park trees since 2000.

Path Forward

The 2014 South Napa Earthquake is a clear reminder of the hazards we face in the Bay Area. Community members' continued support developed Berkeley's resilience to earthquakes and other disasters. Many of these benefits are visible during day-to-day emergency response and community-facing resilience programs including CERT, the Cache Program, BEACON, and the Berkeley Emergency Notification System.

Every day, emergency management staff coordinates with government, nonprofit and private partners, working with scientists to analyze Berkeley's hazards and their potential impacts, developing the City's disaster plans to address them, and organizing trainings and exercises for staff and the community to enable effective response. These efforts are not usually visible to the community at large, but their benefit will become fully realized in Berkeley's next disaster, whether it is a fire in the Berkeley hills or an earthquake on the Hayward Fault.

On December 16, staff plans to return to Council with the 2014 Final Draft Local Hazard Mitigation Plan, which identifies natural hazards in Berkeley and a five-year strategy to further protect Berkeley's people, buildings, infrastructure and environment from their impacts.

BACKGROUND

None.

ENVIRONMENTAL SUSTAINABILITY

Disasters can have negative environmental impacts, for example, from hazardous materials release during earthquakes or floods, or from soil erosion following wildfires. The City's mitigation of disaster impacts and preparedness to respond will reduce environmental impacts of future disasters.

POSSIBLE FUTURE ACTION

None.

FISCAL IMPACTS OF POSSIBLE FUTURE ACTION

None.

CONTACT PERSON

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Attachments:

- 1: Berkeley City Council Disaster Response Quick Reference Guide
- 2: Resilience in Berkeley: Highlights from 25 Years of Community Support

Berkeley City Council

Disaster Response Quick Reference Guide

In a major emergency or disaster, the Mayor and City Councilmembers and their Standby Officers must be ready to attend emergency sessions to ratify and approve necessary disaster legislation, and to work with members of the Public Information Officer's team to provide accurate information to the Berkeley community.

Before a Disaster

- Update your household emergency plan
- Keep your emergency plans and supplies up-to-date
- Mitigate hazards in your home
- Know your neighbors

In a Disaster

The City Manager is Director of Emergency Services

- Controls and directs the City's emergency management effort
- Represents the City in all dealings with public or private agencies
- Line of Succession (Resolution No. 65,983)
 - Deputy City Manager
 - Fire Chief
 - Police Chief

Local Emergency Proclamation Roles, Responsibilities, and Timelines

Director of Emergency Services	City Council Authorization
Proclaim local emergency within 10 days of disaster	Ratify local emergency proclamation within 7 days of issuance Renew proclamation every 14 days Terminate proclamation as soon as emergency conditions are over
Request Governor to proclaim State of Emergency	Authorize Director of Emergency Services' request to Governor
Make and issue rules and regulations to protect life and property	Confirm rules and regulations

Berkeley City Council

Disaster Response Quick Reference Guide

Mayor and City Councilmembers: Roles and Responsibilities

1. Understand the situation
2. Attend emergency City Council sessions
3. Ratify and Approve necessary disaster legislation
4. Work with City PIO to provide accurate information to the community

Key Activities

- Receive Councilmember callout from Council Liaison with EOC activation status and reporting instructions
 - If you do not receive instructions, report to 2180 Milvia
- Review all briefing materials provided by Council Liaison
- Participate in emergency Council sessions
 - Issue/ratify/renew local emergency proclamation, which:
 - Proclaims an emergency or major disaster
 - Is a prerequisite for requesting State and federal assistance
 - Authorizes issuance of orders and regulations to protect life and property (e.g., curfews)
 - Activates pre-established local emergency provisions such as special purchasing and contracting
 - Authorizes undertaking of extraordinary police powers
 - Provides limited immunity for emergency actions of public employees and governing bodies
- Coordinate with the PIO team (through Council Liaison) to provide accurate information to the Berkeley community and the media
- Meet with constituents
- Establish communication with City Councilmembers in neighboring jurisdictions

Standby Officers *(per California Government Code Sections 8636 and 8640)*

If the Mayor or a Councilmember is “unavailable” – either killed, missing, or so severely injured as to be unable to attend meetings and otherwise perform his/her duties, the standby officer shall serve in the Mayor or Councilmember’s place.

- The standby officer takes the oath of office required for the Mayor or Councilmember
- Standby officers shall serve in their posts as standby officers at the pleasure of the governing body appointing them and may be removed and replaced at any time with or without cause.

Resilience in Berkeley

Highlights from 25 Years of Community Support

September 18, 2014

Introduction

On October 17, 1989, the Loma Prieta earthquake struck the Bay Area. The magnitude 6.9 quake killed 63 people, injured 3,757, and displaced 12,053. It destroyed more than 1,000 Bay Area homes and businesses, with damage estimates as high as \$10 billion. Berkeley emerged relatively unscathed from this San Andreas Fault quake. The story would have been different had the quake occurred on the Hayward Fault, which runs through Berkeley. Scientists consider the Hayward Fault to be the most likely Bay Area fault to produce a major earthquake in the coming years.

In addition to earthquake, Berkeley faces a number of natural hazards, including wildland-urban interface (WUI) fire, landslide, flood, tsunami, and communicable disease outbreak. Berkeley is also exposed to manmade hazards, like terrorism, hazardous materials release, and climate change, which creates its own hazards and exacerbates the impacts of others.

City government has developed an extensive suite of programs to increase Berkeley’s disaster “resilience” – the ability to bounce back and emerge stronger in the face of these shocks and stresses. In the 25 years that have passed since Loma Prieta, the Berkeley community has demonstrated the high value it places on resilience, to the tune of over \$600 million in voter-approved tax and bond measures. The table below outlines key measures that have made Berkeley a safer place to live, work and play.

Key Resilience-Building Measures Since 1989

Month/Year	Measure	Title	Impacts
June 1992	A	School Facility Bond	\$158 million for school facility safety and repair, including retrofits
Nov 1992	G	Seismic Safety Bond	\$55 million to retrofit existing fire stations, construct Fire Station 7, construct Public Safety Building
Nov 1996	S	Seismic Safety Bond	\$45 million for seismic retrofit of City buildings, including Civic Center and Main Library
Nov 2000	AA	School Facility Bond	\$116.5 million for school facility safety and repair, including retrofits
Nov 2000	Q	Disaster Fire Protection Bond and Tax	\$9.75 million bond and special tax to purchase above ground water system and construct the Fire Warehouse
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Nov 2008	GG	Fire Protection and Emergency Response and Preparedness Tax	\$3.6 million annually to keep fire stations open and improve emergency medical response and disaster preparedness
Nov 2010	I	School Facilities Bond	\$210 million for school construction and upgrades, including seismic safety improvements and hazardous materials removal

In addition to the key infrastructure improvements outlined above, this report describes how community support has driven resilience-building programs in Berkeley. The report consists of the following sections:

- Section 1: *Berkeley’s Resilience Framework* outlines the documents and partnerships that guide the City’s resilience-building strategies.
- Section 2: *City Government: Maintaining Response Readiness* describes the City’s efforts to develop and maintain government’s capacity to lead Berkeley through any future disaster.
- Section 3: *Empowering the Community to Build Resilience* describes key City programs that enable community members to lead their own readiness and response efforts.
- Section 4: *Measure GG: Key Support* highlights one voter-approved resilience tax, and describes how it supports both community-facing and behind-the-scenes resilience-building activities.

Next, the report turns to the City’s specific efforts to address Berkeley’s three hazards of greatest concern: WUI fire, earthquake and climate change. WUI fire and earthquake have the greatest potential to catastrophically impact the Berkeley community. In addition to its direct impacts like heat waves and sea-level rise, climate change exacerbates all of Berkeley’s natural hazards of concern.

- Section 5: *Hazard Focus: Mitigation and Readiness for Wildland-Urban Interface Fire* describes how Berkeley has reduced the WUI fire risk and increased response capacity since the Tunnel Fire.
- Section 6: *Hazard Focus: Strengthening Berkeley Buildings for Earthquakes* outlines key City programs that have strengthened Berkeley buildings since Loma Prieta.
- Section 7: *Hazard Focus: Climate Change Mitigation and Adaptation* describes how the City and its community partners have made significant strides in reducing greenhouse gas (GHG) emissions and preparing for the reality of a changing climate.

Berkeley's Resilience Framework

Berkeley's strategic plans and partnerships have laid the foundation for its resilience programs.

Policy Framework

The following plans establish the goals and policies that guide Berkeley's resilience-building efforts.

General Plan

In April 2002, City Council adopted Berkeley's General Plan, including the *Disaster Preparedness and Safety Element*. The Element provides the policy framework to support the City's mitigation, preparedness, response, and future recovery efforts. It has guided the City's efforts to reduce the risk of death, injuries, property damage, and economic and social dislocation from natural and manmade hazards and disasters. The Element emphasizes maintenance of response plans, community education, public information, mitigation and City government leadership and coordination with response partners.

Hazard Mitigation Plan

In 2004, the City developed and adopted its first Hazard Mitigation Plan. The Plan identified natural hazards in Berkeley and a five-year strategy to further protect Berkeley's people, buildings, infrastructure and environment from their impacts. Staff used the latest research and an extensive public review process to develop the 2014 Plan update, which is currently with FEMA for a final technical review. This update effort will allow Berkeley to apply for federal mitigation grant programs and State recovery funding, and is agendized for adoption by City Council at its December 16 meeting.

Climate Action Plan

Adopted in 2009 and developed through a robust community engagement process, the Berkeley Climate Action Plan (CAP) articulates the City's approach and priorities for reducing greenhouse gas (GHG) emissions and preparing for the impacts of climate change. The CAP was set in motion in 2006 when Berkeley voters approved Measure G, which set ambitious greenhouse gas emission reduction targets and directed the Mayor to develop a plan to achieve those targets. The plan is the community's guide for reducing greenhouse gas (GHG) emissions to 33% below 2000 levels by 2020 and 80% by 2050. CAP implementation is showing results – community-wide GHG emissions decreased nearly 10% since 2000 despite a 10% increase in population.

Watershed Management Plan

The Watershed Management Plan (WMP) recommends policies and programs related to water quality, creeks, storm drain pipe infrastructure, and maintenance, which are all critical components of managing stormwater in Berkeley. Adopted in 2012, the WMP guides the City's investment in infrastructure improvements that address existing stormwater management challenges and help prepare the community for future challenges associated with flooding from sea-level rise and storms. In November 2012, Berkeley voters approved a \$30 million bond measure to accelerate street improvements and integrate green infrastructure (e.g., bio-retention areas, cisterns, and permeable pavement) where appropriate and consistent with the WMP.

Strategic Partnerships

Because disaster response and recovery will involve the entire Berkeley community, as well as surrounding jurisdictions and all levels of government, the City utilizes strategic partnerships to reduce hazards and prepare for disasters.

100 Resilient Cities

The City of Berkeley recently appointed a Chief Resilience Officer whose role is to guide and accelerate work that increases community readiness for Berkeley's hazards of concern. The position is made possible by a grant from The Rockefeller Foundation through its 100 Resilient Cities (100 RC) initiative. In recognition of Berkeley's leadership on community resilience, in 2014 Berkeley was among an initial cohort of 32 cities worldwide to be selected to participate in 100 RC.

External Partnerships

The City maintains active resilience-building partnerships with a variety of public, private, and nonprofit organizations in Berkeley, the Bay Area, and California. The City's coordinated planning, training, and exercises will facilitate effective response in future emergencies.

Partnerships include:

- AC Transit
- Alameda County
- American Red Cross
- Association of Bay Area Governments
- Bay Area Air Quality Management District
- Bay Area Joint Policy Committee
- Bay Conservation Development Commission
- Bay Area Rapid Transit
- Bay Area Urban Area Security Initiative (UASI)
- Berkeley Disaster Preparedness Neighborhood Network
- Berkeley Lab
- Berkeley Path Wanderers Association
- Berkeley Unified School District
- California Department of Fish and Game
- California Energy Commission
- California Highway Patrol
- California Office of Emergency Services
- Children's Hospital Oakland
- City of Albany

- City of El Cerrito
- City of Emeryville
- City of Oakland
- City of Richmond
- East Bay Municipal Utility District
- East Bay Regional Park District
- Easy Does It
- Ecology Center
- Ed Roberts Campus
- Federal Emergency Management Agency (FEMA) Region IX
- Kinder Morgan Corporation
- Lifelong Medical
- Moraga-Orinda Fire District
- Pacific Gas & Electric
- Sutter Health
- University of California, Berkeley
- US Coast Guard

City Government: Maintaining Response Readiness

City government uses planning, staff training, exercises and partnerships to develop and maintain the capacity to lead Berkeley's disaster response and recovery efforts. Although Berkeley is a relatively small city, the community's support for resilience efforts has made Berkeley a recognized leader in the field, participating in innovative initiatives and leveraging new research and technology to increase Berkeley's resilience.

Citywide Coordination: Response Planning, Training and Exercise

Over the past 25 years, the City's plans have evolved along with the emergency management field. In 1996, City Council adopted the Multi-Hazard Functional Plan, which identified specific responsibilities for each City department in preparing for and responding to emergencies. In 2004, the City created its first Emergency Operations Plan, which defined specific roles and tasks for staff coordinating the City's emergency response. Staff is currently drafting an Emergency Operations Plan update, which will add more definition to existing emergency procedures and protocols and reflect current national and state standards and best practices. This new draft is expected to be presented to Council for adoption in late 2015.

The City has provided an ongoing training and exercise program for Emergency Operations Center (EOC) personnel to ensure an effective response by City staff to a disaster. Over 150 staff members have been trained to work in the EOC, and the City conducts regular exercises to test Emergency Operations Center setup and operations. Additionally, staff members participate with response partners in many other joint opportunities to establish and test disaster response expectations, plans and capabilities. Recent highlights include:

- **Berkeley Lab Full Scale Exercises:** City emergency management staff provides subject matter expert evaluation during annual exercises at the Berkeley Lab. Past scenarios have included suspicious packages and hazardous materials spills.
- **PG&E East Bay Gas Tabletop Exercise:** In October 2013 City staff worked with PG&E to design and implement an exercise testing PG&E's use of the Incident Command System, the Gas Emergency Response Plan, and internal and external communications procedures
- **Energy and Other Lifelines Interdependencies Tabletop Exercise:** The City joined a multidisciplinary group of government and private partners in the February 2014 exercise to examine response to damage and disruption of energy and interconnected infrastructures following severe storms in Alameda County.
- **Center for Homeland Defense and Security (CHDS) Executive Education Seminar in August 2014:** City leadership and key response partner representatives engaged in facilitated policy discussions tailored to Berkeley around a rail accident/hazmat release and fire scenario. The event was conducted by a Mobile Education Team comprised of nationally-recognized experts in various areas related to Homeland Security.
- **Annual Statewide Health and Medical Exercise:** The City regularly participates in this annual exercise, and in November 2014, staff from the Fire, Police, Public Works, and Health, Housing, and Community Services Departments will participate in the exercise to test anthrax attack response procedures.

The City has had many opportunities to put this planning and training into practice in real events, including:

- 2007 Cosco Busan Oil Spill
- 2009-2010 H1N1 Flu Pandemic
- 2011 UC Berkeley Mumps Outbreak
- 2011 Haste Street Fire
- 2011 Stanley Hall Diesel Spill
- 2012 Dwight Way Fire
- 2013 Nash Hotel Fire
- 2013 High Winds Event
- 2014 UC Berkeley Measles Response

Highlight: Care and Shelter

Through training, planning and partnerships, the City has increased its capacity to care for and shelter displaced community members after disaster.

With the support of the Red Cross, the City is ensuring that its staff and facilities are ready to operate post-disaster shelters. Over 60 staff members have been trained in Red Cross Shelter Operations and Management, as well as animal sheltering concepts. Staff will practice their skills at two shelter drills this fall. In addition, Fire-OES has worked with the Red Cross to assess the sheltering capacities of all seven City-owned potential shelter sites. Staff used key findings from Superstorm Sandy and California wildfires to ensure that these sites are both physically and programmatically accessible to everyone in Berkeley, including community members with access and functional needs.

Because many potential shelter sites in Berkeley are operated by City partners, such as the Berkeley Unified School District and UC Berkeley, the City coordinates with and supports these partners' shelter assessment and planning efforts. Staff members from the City, BUSD and the Red Cross have together assessed four BUSD sites' shelter capabilities and accessibility.

Further, the City is working closely with these partners on citywide care and shelter planning. Community members displaced from their homes fires and other emergencies have already benefitted from this collaboration. Immediately following the Haste Street Fire in 2011 and the 2227 Dwight fire in 2012, the City, the Red Cross and UC Berkeley worked together to coordinate support for displaced residents. That support included- Red Cross assistance to meet immediate needs for shelter, food, clothing and medications; City programs for relocation assistance; and for UC students, assistance from the UC campus for medium-term room, board and replacement of books and school supplies.

Highlight: Public Health Emergency Preparedness

Since 2002, the Health, Housing and Community Services (HHCS) Department's Public Health Division has strengthened Berkeley's preparedness for and response to public health threats from natural disasters, infectious disease outbreaks such as pandemic influenza, and bioterrorism.

Hurricane Katrina demonstrated how disasters exacerbate health inequities: the most vulnerable populations are hit the hardest. Public Health Emergency Preparedness is developed by identifying, planning for, and addressing the needs of all community members in disasters. Berkeley's Public Health Division is making progress toward that goal by exercising and revising its plans, coordinating ongoing education and training, engaging in community outreach, and collaborating with partners from Berkeley, Alameda County, and State and federal government.

In the past decade, the Public Health Preparedness program has evolved based on many experiences and accomplishments. Highlights include:

- Public Health Nursing participation in City's Cold Weather response shelters.
- Citywide EOC functional pandemic flu exercise. Public Health Division-led exercise simulating pandemic flu which included training and educational activities for Public Health and City EOC staff.
- Functional Point of Dispensing (POD) Exercises providing seasonal flu vaccine to the public in mass-vaccination clinics.
- Door-to-door dissemination of Pandemic Flu information: "Get Ready Berkeley" Exercise to test dissemination of urgent health information to Berkeley residents.
- H1N1 flu pandemic, which was the City's largest Public Health response to date, involving year-long activation of the PH DOC and ongoing coordination with local, regional, State, and federal agencies regarding infection control measures, disease surveillance, and vaccination.
- UC Berkeley Mumps Outbreak response, in which Public Health worked with UC Berkeley and partners to deliver nearly 4,000 doses of MMR vaccine in order to contain the spread of disease.
- Expansion of Public Health emergency operations to full HHCS Department Operations Center (DOC), engaging staff from mental health, environmental health, housing, employment, and aging services. This expansion has created a robust department-wide response and a larger cadre of City employees with experience working in the Incident Command System structure to respond in exercises and actual community events.
- UC Berkeley Measles response, involving the newly-trained HHCS DOC.
- Regional Cities-Readiness Initiative (CRI) Full Scale Functional Exercise, organized to test the Bay Area Medical and Health Emergency Management coordination and capacity in a regional response scenario, which adds another valuable level of coordination to the 2014 Annual Statewide Exercise.

Highlight: Emergency Public Information and Warning

The City has developed a robust toolkit of emergency notification systems to share life safety instructions with the community.

Berkeley Emergency Notification System

Berkeley's best-known alerting tool is the Berkeley Emergency Notification System (BENS), established in 2004. BENS enables emergency managers to call community members' landline

phones in a targeted geographic area. It can also send geo-targeted text messages and emails to users who subscribe to receive alerts. Since BENS was established, the Berkeley Police and Fire Departments have used it to share shelter-in-place notifications to community members in incidents involving active shooters, natural gas leaks, and suspicious packages.

1610 AM

The City has installed a transmitter to broadcast citywide emergency information on a continuous basis over radio station 1610 AM. The 1610 AM broadcast strength is 10 watts, which reaches most of Berkeley. In 2011, the City signed a memorandum of understanding with KPFA radio, authorizing KPFA staff to rebroadcast or simulcast the 1610 AM signal on KPFB 89.3 FM. This partnership will help to provide emergency notification coverage to community members who do not receive a clear signal from 1610 AM.

Emergency Alert System

The Emergency Alert System (EAS) is the national public warning system, and can interrupt television and radio broadcasts. Through officials in Alameda County, the City can request activation of EAS to deliver important emergency information and instructions to community members.

Coordination, Education and Outreach

Alerting systems must be well-coordinated to deliver timely, accurate, consistent emergency alerts to the community. To ensure that City responders effectively use the multitude of alerting systems available, Fire-OES recently developed Administrative Regulation (AR) 9.3: *Use of Emergency Public Information and Warning Systems*. AR 9.3 is the first Citywide protocol to establish coordinated guidelines for use of the Berkeley Emergency Notification System, 1610 AM radio and the Emergency Alert System to issue emergency public information and warning messages. Staff is currently being trained in these new regulations.

Staff has developed additional community outreach material about the capabilities and limitations of the City's emergency notification warning systems, and the procedures guiding their use. In an emergency, emergency managers from the City and partner agencies may use many different tools to provide emergency information and instructions to the community. The Fire Department's Office of Emergency Services has developed a brochure and website (www.CityofBerkeleyinfo/EmergencyAlerting) to inform the community about these systems. The brochure is available for download on the website and it has been distributed by staff members at community outreach events such as National Night Out and the Solano Stroll.

Countywide Emergency Notification System

In 2013, the Alameda County Civil Grand Jury recommended that the County take the lead in developing a countywide emergency notification system. Berkeley staff members are providing subject matter expert guidance to Alameda County on its procurement of a countywide emergency notification system for joint use by the County and its cities. This countywide system will provide an opportunity for the City to harness new emergency alerting technology from the federal Integrated Public Alert and Warning System (IPAWS). This system will enable the City to send wireless emergency alerts to mobile phones based on their real time location, instead of relying on pre-emergency signups. IPAWS will also automatically coordinate alert deliveries from multiple systems, instead of requiring a manual activation process for each system. The countywide system is expected to be online in July 2015.

Nixle

In 2014 the City procured the Nixle system for the Police Department to connect with community members via text message, email and the web. The Police Department uses the system to share important community messages, including local crime updates, severe traffic alerts, missing persons alerts, and community messages. This system is meant to supplement, but not replace, the City's emergency public information and warning systems.

Empowering the Community to Build Resilience

While City government develops its own response capacity, the City also communicates to the community that in a disaster, normal government response systems may be unavailable, and community members will need to work together to support one another. The City has numerous programs to empower community members to lead their own disaster readiness and response efforts. The City uses a combination of nationally-recognized disaster readiness programs and Berkeley-specific efforts to accommodate the unique capabilities and needs of different populations in the Berkeley community. The resulting community engagement programs are cutting-edge, award-winning, and fully-inclusive.

Community Emergency Response Team Program

The Fire Department's Community Emergency Response Team (CERT) Program provides a comprehensive structure for community members to learn, practice, and maintain skills and community collaboration for disaster readiness and response.

The City provides CERT training for free to all Berkeley community members. Courses are taught by firefighters, and community members learn how safely put out small fires, conduct light search and rescue, help with first aid, and to communicate effectively with City emergency responders. Fire-OES tailors disaster readiness program offerings to address community needs. Specific classes from the 20-hour CERT curriculum are offered monthly, and for one weekend each quarter the full curriculum is also offered in a three-day-long Academy format. In 2014, the Fire Department began offering LISTOS, a Spanish-language disaster preparedness curriculum. LISTOS classes are not only taught in Spanish, but are organized to accommodate diverse family and community structures. Additionally, a CERT instruction vehicle is currently under construction. When completed in 2015, the Fire Department will be able to offer CERT classes offsite, meeting community members where they live, work and play.

Through the annual Citywide Exercise, the CERT program also provides community members the opportunity to practice the skills they have developed in CERT classes, and promotes general disaster preparedness and response concepts to everyone in Berkeley. The first Citywide Exercise was in 2012. The 2013 Citywide Exercise had an estimated 2,000 community participants; and the 2014 exercise is scheduled for October 18. Fire-OES has provided exercise activity guides to help participants customize emergency drills for themselves or their groups. All community members are invited to participate at any level, regardless of their prior CERT training. Activities range from basic phone contact with out-of-area emergency contacts and listening to emergency broadcasts from the City, to setup of neighborhood incident command posts to organize and conduct simulated CERT light search and rescue operations and practice emergency radio communications.

In addition to the Citywide Exercise, in 2014 CERT volunteers designed, planned, and implemented the City's first Community Emergency Prep Fair. Event activities were designed to engage community members in taking action to better prepare themselves and their families for emergencies. The Fair brought participants together by providing a family and kid-friendly environment to enjoy a day of fun and learning while improving the disaster readiness of the Berkeley community. The Berkeley CERT Fair Planning Team was selected as the recipients of the FEMA Region IX Honorable Mention in the Whole Community category:

<http://www.ready.gov/citizen-corps/citizen-corps-awards>

Disaster Cache Program

The Community Emergency Supply (“Disaster Cache”) Program builds on the CERT training to incentivize ongoing community organizing for disaster readiness. Caches are designed to help communities to use their CERT training to operate in a post-disaster environment, when City services may be limited. Caches include a generator, tools, first aid supplies and other emergency supplies and equipment. To date, the City has awarded 87 caches to neighborhood groups; congregations; and UC Berkeley sororities, fraternities, and co-ops that have undertaken disaster readiness activities. Staff is currently expanding the program to include community-based organizations and businesses.

Dumpster Program

Starting in 2014 neighborhood groups qualify for a free dumpster when they host two organized meetings focused on disaster preparedness with City Fire, Police, and/or Public Health staff. The Dumpster Program dovetails with the Cache Program as an incentive for neighborhoods to stay engaged in ongoing disaster preparedness activities. Groups that begin meeting can earn a dumpster before they have qualified for a cache, and groups that have a cache can earn a dumpster by continuing their disaster readiness engagement activities.

Berkeley Emergency Accessible Community Organizations Network

Community members with access and functional needs may require specific information and services to be ready for, respond to and recover from disasters. In 2014, Fire-OES invited community organizations that represent and serve seniors and people with disabilities to establish the Berkeley Emergency Accessible Community Organizations Network (BEACON). Member organizations include Easy Does It, the Ala Costa Center, and the Berkeley Senior Centers.

BEACON is an information-sharing hub for City government and these organizations both before and after disasters. BEACON meets regularly, sharing resources to increase disaster preparedness, to plan preparedness events, and to develop strategies to meet the needs of people with disabilities and seniors during disaster response and recovery. After a disaster, the City plans to disseminate emergency response and recovery information through BEACON member agencies to reach community members with access and functional needs.

Public Health Community Preparedness and Engagement Program

The Public Health Community Preparedness and Engagement Program utilizes a multi-generational approach to developing disaster resilience. The Program hires transitional-age youth interns from underserved neighborhoods and trains them to be “disaster ambassadors.” These ambassadors deliver interactive emergency preparedness trainings to their peers and neighbors. The trainings are one hour long, and are based on a combination of CERT, LISTOS, and Alameda County PREP materials. In addition to the disaster resilience benefit to the community, youth interns are provided with experiences and educational opportunities that develop their emergency preparedness and community organizing/leadership skills. Thus far, the program has held 13 workshops and the interns have hosted emergency preparedness information tables at four community events.

Measure GG: Key Support

As described earlier, the Berkeley community has demonstrated its support for disaster resilience through voter approval of over \$600 million in funding measures since 1989. In addition to the many bond measures that voters have passed to strengthen Berkeley's physical infrastructure, one voter-approved tax in particular has enabled many of the City's recent resilience activities: Measure GG.

Originally passed by voters in 2008, Measure GG provides over \$3.5 million annually to support fire stations, medical response and disaster preparedness. Many of these benefits are visible during day-to-day emergency response: Measure GG has primarily funded maintenance of minimum staffing at fire stations and an increase the number of first responder paramedics. The measure funded the City's investments in radio interoperability through the EBRCS system, which helps responders to communicate when small emergencies grow large.

In addition to these emergency response benefits, Measure GG supports many community-facing resilience programs outlined in this document, including CERT, the Cache Program, BEACON, and the Berkeley Emergency Notification System.

Through its support of City staff positions, the measure has also funded essential "behind-the-scenes" resilience-building work. Every day, emergency management staff coordinates with government, nonprofit and private partners, working with scientists to analyze Berkeley's hazards and their potential impacts, developing the City's disaster plans to address them, and organizing trainings and exercises for staff and the community to enable effective response. This work has resulted in upcoming updates to the Local Hazard Mitigation Plan and the Emergency Operations Plan, the recent expansion of Berkeley's care and shelter capability, and the maintenance of Berkeley's emergency public information and warning systems. These efforts are not usually visible to the community at large, but their benefit will become fully realized in Berkeley's next disaster, whether it is a fire in the Berkeley hills or an earthquake on the Hayward Fault.

Measure GG is also a force multiplier: when strategic opportunities arise, Measure GG-funded staff work to procure additional funding to support and expand the City's voter-funded resilience activities. For example, in 2014, emergency management staff secured the Rockefeller Foundation's 100 Resilient Cities grant, and developed plans that will enable the City to use and apply for additional federal mitigation grant funding.

Hazard Focus: Mitigation and Readiness for Wildland-Urban Interface Fire

Berkeley has significant WUI fire history, most recently in the October 20, 1991 Tunnel Fire. This fire in the Oakland/Berkeley hills was declared the most destructive wildland-urban interface fire in United States history. While the fire burned a greater area in Oakland, it raged across the city boundary between Oakland and Berkeley, destroying entire neighborhoods in both cities and killing 25 people.

Berkeley's most destructive fire was the Berkeley Fire of 1923, which began in the open lands of Wildcat Canyon to the northeast and, swept by a hot September Diablo wind, penetrated residential north Berkeley and destroyed nearly 600 structures, including homes, apartments, fraternities and sororities, a church, a fire station and a library.

Over the past 23 years since the Tunnel Fire, Berkeley has reduced its WUI fire vulnerability, and developed specialized response capabilities and partnerships to quickly respond to this ever-present threat.

Partnerships and Coordination

The natural, undeveloped areas to Berkeley's east pose a significant fire hazard to the community. Recognizing this danger, the Berkeley Fire Department has built cooperative relationships for fire response with Fire Departments from Alameda County, Oakland, Moraga-Orinda, East Bay Regional Parks, El Cerrito, Kensington, and Richmond. These mutual response agreements have increased the fire resources that respond to the reporting jurisdiction to put out vegetation fires before they grow into multi-jurisdictional problems.

This cooperation has been aided by the inter-jurisdictional Hills Emergency Forum (HEF), which started after the Tunnel Fire. HEF exists to coordinate the collection, assessment, and sharing of information on East Bay Hills fire hazards, and to provide a forum to build interagency consensus on fire safety standards and codes, protocols for incident response and management, public education programs, multi-jurisdictional training, and fuel reduction strategies.

Reducing Wildfire Vulnerability

In addition to collaborating with surrounding response agencies, the City aggressively mitigates Berkeley's own wildland-urban interface (WUI) fire hazard. The City protects community members, the built environment, and natural resources using development regulations, fire inspections, vegetation management, and improvement of access and egress routes.

Building Codes

Since 1990, the State has passed many code regulations for buildings located in State fire zones, which includes the Berkeley and Oakland Hills. The City has adopted these State codes and expanded their application to cover more at-risk areas in Berkeley. These changes have resulted in Berkeley's Hazardous Fire Zone being increased from 720 properties before the 1991 Tunnel Fire to over 8,000 currently. The City also made State codes more stringent, expanding requirements to include additions, alterations, repairs, and re-roofing. Additionally, areas in Berkeley's Fire Zone 3 (extremely high fire hazard severity zone) have added requirements for a fire warning systems, automatic sprinkler systems, utility enclosures, water service, access roads, fire trails, and brush and vegetation control.

Inspections and Vegetation Management

The Berkeley Fire Department annually inspects over 1,200 parcels in designated high fire risk zones for hazards such as excess vegetation. The Fire Department also conducts complaint-driven inspections throughout the City. Residents must clear combustible brush and vegetation adjacent to building property lines and roadsides. Tree branches must be cleared from any chimney, stovepipe, or overhang over a building. All leaves, needles, and dead vegetation must be swept from roofs. This program is operated in cooperation with the East Bay Regional Park District, which has programs to limit combustible material in the wildland-urban interface zone on its property.

The City runs a number of vegetation management programs to reduce fuel loads. The Fire Fuel Chipper Program is a popular yard waste collection service. The program serves properties in the hills from June through September each year. From 2005 to 2011, over 200 tons of vegetation was collected and recycled, on average, each year. The Department of Public Works' Solid Waste Division coordinates the Fire Fuel Debris Bin Program. The Program delivers and removes 30 yard roll-off boxes from requesting neighborhoods, an effort yielding an average of 20 tons of plant debris per year. Additionally, 14,000 tons of residential plant debris is collected annually through weekly curbside collection. From mid-June to mid-August each year, a fire fuel abatement program removes an average of 125 tons of debris from 95 public sites, including parks, pathways and medians. This program is a joint effort of the City and the East Bay Conservation Corps.

Pedestrian Evacuation

Since 1998, the City has partnered with the Berkeley Path Wanderers Association (BPWA) to build and maintain rustic paths to assist with evacuation and firefighting efforts in the Berkeley hills. In the city's many steep neighborhoods with winding roads, these paths take the shortest, most direct routes, mimicking city block grids that do not exist. Since 2004, BPWA has improved 21 paths in the hills north of the UC Berkeley campus. The City's Department of Public Works performs heavy maintenance, such as cement work and hand rail installation and replacement. In 2005, the City, the Berkeley Path Wanderers Association and Boy Scout Troops 4 and 19 used a grant award to build Glendale Path, a vital three-block-long evacuation route that shortens the evacuation distance by almost half a mile for pedestrians in the area.

Maintaining Response Readiness

Early suppression prevents many WUI fires from growing out of control. Before and since the 1991 Tunnel Fire, the City has increased its response capabilities by building firefighting infrastructure, purchasing equipment, training its staff and coordinating with its partners.

Firefighting Infrastructure and Equipment

Development of firefighting infrastructure and purchases of specialized equipment have enabled firefighters to increase their communications capabilities and to more specifically target responses to Berkeley's particular hazards.

In past disasters, lack of communication capability among response agencies hindered response operations. In 2012, the Berkeley Fire and Police Departments migrated to the new East Bay Regional Communications System (EBRCS), using voter-supported funding from 2008's Measure GG. EBRCS enables a new level of interoperability among the City and its partners: responders can use EBRCS to communicate with 32 other jurisdictions for fire, law enforcement, and emergency medical service response.

In 2006, using funding from the 1992 Measure G Bond, the City constructed Fire Station 7 on Shasta Road, just north of the UC Berkeley campus in the hills. This station is in the wildland-urban interface and is the only City fire station east of the Hayward fault.

Following the 1991 Tunnel Fire, the City purchased equipment specifically tailored to the demands of fighting fire in the areas where wildland and urban areas meet. In 1994, the Fire Department purchased two Type VI engines; and in 2011, the Department used a FEMA grant to purchase a Type III Wildland Engine. Additionally, the Department has purchased specialized wildland gear for each firefighter, which is kept ready on every engine during periods of high fire danger. These apparatus and equipment expand Berkeley's capacity to fight fires in areas where wildland and urban areas meet.

In 2010, the City put into operation an aboveground, portable water system which can pump water from any source if tanks are drained or pipelines are damaged. The system enables the Berkeley Fire Department to move enough water from Aquatic Park, San Francisco Bay, or Lake Anza to fight fires in most areas of the City. This system was funded by voters through the 2000 Measure Q bond.

Training and Drills

The Fire Department also conducts regular training and drills to keep firefighters ready to respond to a wind-driven WUI fire in the hills, which could transition into a fast-moving urban firestorm in the flatlands. All firefighters are certified in basic wildland firefighting and receive four sessions of wildland training, including fire behavior, structure protection, tactics and off-road driving. All firefighters receive annual training to understand "fire weather" and to perform surveillance of critical fire weather patterns. Additionally, firefighters hone these skills in annual wildland firefighting training drills with Alameda and Contra Costa Counties, as well as regional communications and staging drills to familiarize outside agencies with Berkeley target hazards and staging areas.

Hazard Focus: Strengthening Berkeley Buildings for Earthquakes

In earthquakes, buildings are not only vulnerable to ground shaking, but also to ground displacements associated with fault rupture, liquefaction and landslides. For this reason, Berkeley is using a multi-pronged approach to strengthen municipal buildings and to require, incentivize, and support private building owners to retrofit their structures. Berkeley has also begun development of programs to expedite building safety evaluations following earthquakes, to enable response activities and accelerate recovery.

Municipal Building Improvements

The City has strengthened or rebuilt numerous public buildings with support from an active public, City and State bonds, and FEMA grants. Many of the City's emergency response and recovery efforts will be operated from these buildings:

- The Martin Luther King, Jr. Civic Center Building (City Hall) houses many key government functions and was seismically retrofitted in 2001 using funds from 1996 voter-approved Bond Measure S.
- The Public Safety Building contains the 9-1-1 emergency communications center and the Emergency Operations Center, where Berkeley's disaster response will be coordinated. The building was constructed in 2000 using funds from Measure G, a 1992 bond measure that funded \$55 million in improvements to public safety infrastructure.
- Six fire stations were retrofitted using Measure G funding. Measure G also funded the 2006 construction of Fire Station 7, Berkeley's only fire station east of the Hayward Fault.
- The Fire Warehouse, which holds specialized response equipment for emergency deployment, was constructed in 2011 with funding from Measure Q (approved by voters in 2000).
- The Ratcliff Building serves as the Public Works Department Operations Center, where the Department will coordinate its field response activities in a disaster. This historic structure was retrofitted in 2012 with FEMA grant support.
- All libraries have been retrofitted or rebuilt with support from the voter-approved Bond Measures S (1996) and FF (2008). These measures funded renovation, construction, and seismic and disabled access improvements at the City's Main Library and four neighborhood branch libraries. Libraries function as community gathering spaces before, during and after disasters.
- The Dona Spring Animal Shelter was constructed in 2013 with funding from 2002 bond Measure I. The animal shelter will support the City's efforts to care for Berkeley animals in disasters that displace their owners.
- Berkeley Unified School District pre-K, K-12, adult, transportation, and administration buildings have been retrofitted or rebuilt through several local bond measures, including \$158 million Measure A in 1992, \$116.5 million Measure AA in 2000, and \$210 million Measure I in 2010. In addition to protecting children and staff in earthquakes, public school retrofits are critical to disaster response: schools may be

used to temporarily shelter people displaced from their homes. Schools also support disaster recovery, providing a welcome return to normal routines for children, and childcare so that parents can rejoin the workforce.

Post-Earthquake Municipal Building Assessment

Since 2011, City staff has been developing and reviewing post-earthquake safety assessment inspection protocols for critical City buildings. These protocols will guide staff in performing rapid evaluations of City buildings following a major earthquake.

In November of 2011, the City hosted a Safety Assessment Program training to certify staff in post-earthquake safety assessment procedures. Forty-one people were trained, including staff from the Building and Safety Division, the Public Works Department, the Fire Department, and the Health, Housing and Community Services Department, as well as UC Berkeley facilities staff and community volunteers.

Strengthening Private Buildings in Berkeley

Berkeley uses a multi-pronged approach to improve the seismic resilience of the city's privately-held building stock. The City has added more stringent local amendments to the California building code that will save lives in the next catastrophic earthquake, as well as financial incentives and guidance to encourage building owners to retrofit their structures. Two programs in particular promise to bring considerable increases in safety: The Unreinforced Masonry (URM) Safety Program and the Soft Story Program.

Incentives and Support

The City incentivizes community members to voluntarily strengthen their buildings. In July 1991, City Council adopted a Transfer Tax Rebate Ordinance, which rebates up to one-third of the transfer tax amount for earthquake upgrades on homes. Since July 2002, the City has distributed over \$9 million to homeowners through the Ordinance.

The Senior and Disabled Home Rehabilitation Loan Program assists very low-income senior and disabled homeowners in repairing their homes, to eliminate conditions that pose a threat to their health and safety, and to help preserve the City housing stock. Qualified borrowers can receive interest-free loans of up to \$35,000.

The City provides guidance to building owners to help them meet increased seismic safety requirements and take advantage of reimbursement programs. The City has developed more options and technical standards to seismically strengthen single-family homes and multi-unit apartment buildings. The City has published guidelines for Transfer Tax Reductions to clarify the types of voluntary seismic strengthening work that qualify for a Transfer Tax Rebate.

Unreinforced Masonry Safety Program

Unreinforced masonry (URM) buildings are constructed of brick, block, tile, stone, or other types of masonry and have no or inadequate reinforcement to keep them from structural collapse in earthquakes. These buildings proved to be hazardous in both the 1989 Loma Prieta Earthquake and the 2014 South Napa Earthquake.

In 1989, in response to State law, the City of Berkeley compiled an inventory of about 700 URM structures constructed before 1956, used for both commercial and residential purposes. In 1991, City Council adopted the Unreinforced Masonry Ordinance, which mandated seismic retrofit of

all URM buildings on the inventory. The URM ordinance has structural engineering and prescriptive guidelines providing technical assistance for design professionals. Since the original inception of Berkeley's URM Safety Program in 1991, over 97 percent of URMs on the City's Hazardous Building Inventory have been seismically retrofitted, demolished, or demonstrated to have adequate reinforcement.

Soft Story Program

A building with a soft, weak or open front (SWOF) condition is a multi-story building in which one level is significantly more flexible than the floors above it and the floors, or foundation, below it. When subjected to earthquake forces, this weak first story can be severely damaged and shift out of plumb or even collapse, as was evidenced in the 1989 Loma Prieta and 1994 Northridge Earthquakes. While these buildings are present throughout California, Berkeley is one of only three cities addressing the problem with a mandatory retrofit ordinance. As of January, 2014, the City requires owners of soft story buildings with five or more dwelling units to retrofit their buildings by 2018. Under the first phase of the soft story program, starting in 2005, SWOF building owners were required to submit an engineering evaluation report identifying their building's weaknesses and ways to remedy those weaknesses, to post earthquake warning signs and to notify their tenants of the buildings' potentially-hazardous condition. Of 323 soft story buildings identified, 138 remain to be retrofitted.

Automatic Gas Shutoff Valves

Recognizing that natural gas contributes to one-quarter of post-earthquake fires, the City has encouraged building owners to install automatic gas shutoff valves. These valves automatically shut off natural gas service to a building when they sense localized shaking above a level that could result in damage to the gas pipe system, preventing gas releases that can lead to fires or even explosions.

In October 2010, the Berkeley Municipal Code was amended to require automatic gas shutoff valves for any existing building undergoing additions, alterations or repairs with the valuation of the work exceeding \$50,000. In April 2012, the City reduced the unit cost permitting fee for valve installation. The City also established a \$50 flat rate permit for voluntary installation of automatic gas shutoff valves in two or more residences on a block, when no other plumbing work takes place and inspections are performed on a coordinated basis. Funded by Measure GG and expected to launch in late 2014, the Automatic Gas Shutoff Valve Program will provide free automatic earthquake gas shutoff valves to people who participate in disaster readiness training and will cover the permit fee for low-income homeowners.

Building Occupancy Resumption Program

The newly-established Building Occupancy Resumption Program (BORP) will accelerate the recovery of Berkeley's economy following the next major earthquake. The program will allow participating building owners to use approved engineers to inspect private buildings, reducing inspection delays and increasing access to undamaged buildings. BORP enables owners of private buildings to secure the services of California licensed engineers to create post-disaster inspection plans for their buildings and submit the inspection plans and inspectors' credentials to the City of Berkeley for review and approval. Once approved, the engineers become automatically deputized as City inspectors for these buildings following a local emergency proclamation. Engineers preapproved for BORP-listed buildings will be able to post the

buildings with official City of Berkeley placards for continued occupancy (green placard), partial or conditional occupancy (yellow placard), or unsafe to enter (red placard), subject to later review by the City's Building and Safety Division.

BORP is a program initially developed by the City and County of San Francisco's Department of Building Inspection (DBI), with the cooperation of the Structural Engineers Association of Northern California (SEAONC), San Francisco Chapters of the Building Owners and Managers Association (BOMA) and the American Institute of Architects (AIA). The Berkeley Planning Department has developed a BORP manual based on San Francisco's manual, which is attached. BORP inspectors will use SEAONC and California Office of Emergency Services (OES) approved guidelines, forms and checklists.

Hazard Focus: Climate Change Mitigation and Adaptation

Climate change is a global issue with local impacts. Our region and our city is experiencing and will increasingly experience the impacts of the changing climate, including rising temperatures, drought, and flooding due to sea-level rise and extreme storms. These impacts affect our natural environment, our built infrastructure, and the health and safety of the people that make up the Berkeley community. Climate change impacts also exacerbate the hazards of concern identified in the 2014 Local Hazard Mitigation Plan (LHMP), including wildland fire and landslide.

Climate Action Plan and Local Hazard Mitigation Plan

In addition to serving as the community's guide for achieving deep reductions in greenhouse gas emissions, the CAP provides an initial analysis of Berkeley's climate change risks and recommendations for mitigating those risks. The 2014 LHMP builds on the climate change hazard analysis outlined in the CAP by providing updated, more localized data on warming trends and forecasts, precipitation and drought, and sea-level rise. The LHMP also provided an opportunity to augment the climate change mitigation actions identified in the CAP. The City and its partners in the community and at other agencies are making important progress on these recommendations, including:

- Preparing for sea-level rise and associated flooding: The Alameda County Public Works Agency recently enlisted a consultant team to conduct the most granular analysis to date of Berkeley's vulnerability to sea-level rise. A multi-departmental team is reviewing the analysis to incorporate the best available forecasts into the City's capital improvement and land use decision-making.
- Preparing for drought: Water efficiency and conservation takes on increased urgency in the face of prolonged drought. As well as partnering with East Bay Municipal Utility District to encourage water efficiency in the community, City government is reducing water use in its own operations. A preliminary assessment of water consumption in City operations for the months of April through June 2014 shows a reduction of approximately 27% over the average of the same months in 2012 and 2013.
- Preparing for increasing temperatures: The scientific community forecasts 6 - 10 additional heat waves per year in Berkeley by 2100. As temperatures go up, expanding local tree cover gains increasing importance. The City has consistently worked to increase street and park tree planting; Berkeley has gained over 4,650 street and park trees since 2000.
- Preparing for loss of grid power: The CAP articulated recommendations for reducing community-wide energy consumption and dependence on fossil fuels. The LHMP more explicitly connects energy use and disaster readiness by recommending that the City undertake specific activities designed to increase its "energy assurance," meaning the ability of critical, community-serving facilities to continue serving their function in the event of loss of power and/or natural gas service. Increasing energy assurance by reducing energy consumption and employing micro-grids and clean sources of backup power is a top priority for advancing resilience.

Integrating Climate Action throughout City Operations

Achieving scale with Berkeley's GHG reduction and climate change hazard mitigation efforts requires that this work be integrated throughout City operations and that it is part of everyone's

job. The City's Sustainability Working Group was established in May 2013 to help achieve this objective. It is a multi-departmental team chaired by the Chief Resilience Officer. To date, the SWG has implemented 3 main strategies:

- *Created an "Environmental Sustainability" section in all reports to City Council, which requires all City staff to consider and articulate the linkages between the subject of the report and the City's goals to respond to climate change*
- *Integrated environmental sustainability practices into the Citywide work plan by tasking each City department to identify practices designed to advance GHG reductions and climate change readiness*
- *Launched the Berkeley Environmental Achievement Awards, which are designed to celebrate City employee actions that contribute to a culture of sustainability throughout the City government*

The Sustainability Working Group will continue its efforts to increase the scale and impact of the recommendations identified in the CAP, the LHMP, and other plans related to community resilience.

Timeline of Key Events

The timeline in the table below is adapted from the City’s *2014 DRAFT Local Hazard Mitigation Plan*. It identifies some of the key activities and disaster events that have impacted Berkeley’s disaster resilience programs and resources by developing public awareness or making statewide or national changes to the mitigation landscape.

<u>Date</u>	<u>Event</u>	<u>Notes</u>
October 1989	Loma Prieta Earthquake	Magnitude 6.9 earthquake causes some damage to buildings in Berkeley. New cracks found in MLK Jr. Civic Center building. Regionally, resulted in 62 deaths and major damage. Significant transportation system impacts.
December 1989	URM inventory established	700 URMs identified and owners notified of required retrofit.
1989	Berkeley Unified School District hires engineers to evaluate structural safety of buildings	Significant problems found; District closes many schools and develops plan to correct safety problems
1990	Seismic Hazards Mapping Act passed	Regulates development, requires mapping and real estate disclosure in earthquake-induced landslide and liquefaction zones.
July 1991	Transfer tax rebate ordinance adopted	Allows for tax rebate for seismic safety improvements to dwellings. Retroactive to 10/17/89
Mid- 1991	Fee waiver program established	Waives permit fees on residential seismic safety projects. Program ended due to budget constraints in early 2000s.
October 1991	Tunnel Fire	62 homes burned in Berkeley, more burned in neighboring Oakland. 25 deaths total and \$1.5 billion total damage.

<u>Date</u>	<u>Event</u>	<u>Notes</u>
1991	Hills Emergency Forum established	Planning and coordination body formed to address East Bay fire hazards
December 1991	Established mandatory URM retrofit program	To date over 97% of URMs have improved seismic resistance
June 1992	Measure A approved	\$158 million made available for school safety programs.
November 1992	Measure G approved	\$55 million made available for municipal safety improvements.
1993	UC Berkeley Tang Center constructed	Facility constructed to essential facilities standard, to be ready to provide key support to Berkeley healthcare system in a disaster
1994	EBMUD allocates \$189 million for seismic upgrades	Upgrades completed in 2006
1994	Northridge Earthquake	6.7 magnitude earthquake causes \$28 billion in losses
March 1995	Seismic Technical Advisory Group convened	Assured City has appropriate technical information to make informed seismic safety policy decisions.
July 1996	Tilt-up building inventory developed	59 tilt-up structures identified.
November 1996	Measure S approved	\$45 million made available for seismic retrofit of City buildings.
August 1997	The University of California's SAFER Program established	10-point action plan for the University's \$1.2 billion reconstruction program. A review of UC Berkeley's buildings found that 27% need to be seismically upgraded.
1997	UBC updated	Requirements increased for buildings close to active faults.

<u>Date</u>	<u>Event</u>	<u>Notes</u>
Winter 1997-1998	Landslide in North Berkeley	1 home significantly damaged and has to be demolished
1998	Natural Hazards Disclosure Act passed	Requires sellers of property to provide "Natural Hazards Disclosure Statement" if property lies within State-mapped hazard area.
December 1999	Award from FEMA	Berkeley designated Project Impact Model Community of the Year.
July 2000	Tsukamoto Public Safety building complete	The City's hazard-resistant essential services building is constructed. It houses the City's primary Emergency Operations Center, emergency communications center and Police Department and Fire Department headquarters.
September 2000	Magnitude 5.1 Napa earthquake	
November 2000	Measures AA and Q approved	\$116.5 million for school safety program; Tax measure for safety efforts.
2001	Martin Luther King Jr. Civic Center retrofit completed	Building housing key City government functions is base isolated for seismic safety.
2001	Soft story buildings inventoried	City partners with UC Berkeley and outside experts; uses FEMA grant to inventory soft story units
2002	Award from Disaster Resistant California	Berkeley rewarded for demonstrating significant commitment to pre-disaster mitigation.
2002	Main Library retrofit completed	Main library identified as location for City's emergency volunteer center

<u>Date</u>	<u>Event</u>	<u>Notes</u>
February 2003	Completion of the CGS hazard maps.	New buildings are required to meet strict design and construction standards if they are located in potential liquefaction or landslide areas.
2003	Award by California OES	Berkeley designated model community.
2003	New General Plan adopted	General Plan's Disaster Preparedness and Safety Element guides the 2004 and 2014 Local Hazard Mitigation Plans
2004-2005	Flooding in Codornices, Strawberry, Potter and Schoolhouse watersheds	
2005	City adopts soft story ordinance	Berkeley requires owners of soft story buildings with 5 or more units to conduct engineering studies and take other measures.
2006	Assembly Bill 127 passes	Provides California Community Colleges with the option to comply with local building codes in lieu of the Field Act
2006	All fire stations seismically safe	Berkeley completes the reconstruction of Fire Station 7. The other six were seismically upgraded in previous years.
2006	Disaster Council and Fire Safety Council combined	Continued monitoring and advocacy.
2006	EBMUD evaluates Claremont Reservoir Dam for seismic risk	Study concludes that dam will perform satisfactorily in 7.25 magnitude earthquake on Hayward Fault
2006	UC Berkeley opens Center for Fire Research and Outreach	Center focused on wildfire information and collaboration

<u>Date</u>	<u>Event</u>	<u>Notes</u>
2006	Alameda County Local Agency Formation Commission expands Berkeley's Sphere of Influence on Panoramic Hill to include Oakland	Action performed despite opposition letters from Berkeley and Oakland. Berkeley/Oakland homeowners will need to collaborate to fund a Specific Plan.
2007	Glendale Path completed	City, Path Wanderers and Boy Scouts partnered to use FEMA funding for pedestrian evacuation route in the Berkeley hills
February 2007	EBMUD Claremont Tunnel retrofit complete	
2008	Neighborhood disaster supply cache program begins	To date, the City has awarded 87 caches of disaster response equipment to neighborhoods, congregations, and UC Berkeley Pan-Hellenic groups that have undertaken disaster readiness activities.
2008	Council adopts moratorium on development in Panoramic Hill	Moratorium repealed in 2010 and replaced with ordinance
September 2009	City updates Municipal Code Chapter 17.12 <i>Flood Zone Development Ordinance</i>	Update ensures Berkeley's continued compliance with National Flood Insurance Program
2009	City Council adopts Climate Action Plan	Climate Action Plan guides Berkeley's efforts to reduce carbon emissions and engage in climate adaptation planning
2009	Branch Library Improvement Program begins	By 2013, 3 of 4 branch libraries have completed retrofits for seismic safety
2010	BART completes work to upgrade Transbay Tube seismic joints	
2010	Berkeley voters approve Measure I	Funds improvements to school safety, including seismic work

<u>Date</u>	<u>Event</u>	<u>Notes</u>
2010	Aboveground Water Supply System operational	Portable system can pump water from any source to fight fires if tanks drained or pipelines damaged
2010	Council passes ordinance blocking establishment of any residential units on Panoramic Hill	Ordinance requires adoption of a Specific Plan for safety improvements to infrastructure
2010	City of Berkeley adopts Ordinance 7,157-N.S.	Adopts 2010 fire code with local amendments Adds addresses to fire zone two (to “combined hillside district”) Designates Zones 2 and 3 to be Very high fire hazard severity zone(s) and Wildland-Urban Interface Fire areas
2010	City develops <i>Guide to Conserving Water through Rainwater Harvesting and Graywater Reuse for Outdoor Use</i>	Provides information to help homeowners be ready for impacts of climate change on regional water resources
2010	BMC Amended to require automatic gas shutoff valves	Automatic gas shutoff valves required for any existing building undergoing additions, alterations or repairs exceeding \$50,000
December 2010	California Emergency Management Agency releases first-ever tsunami inundation maps within San Francisco bay	Map helps to inform tsunami readiness activities
2011	Diesel spill on UC Campus	Diesel enters Strawberry Creek; response requires coordination of City, State and federal agencies
2011	Public Works Engineering Division develops hydraulic models for Codornices and Potter watersheds	Models predict areas of likely overflows

<u>Date</u>	<u>Event</u>	<u>Notes</u>
March 2011	Earthquake off coast of Japan causes tsunami in Berkeley	Tsunami surge entered Berkeley Marina and caused \$158,000 damage to boats and docks
October 2012	City Council adopts Watershed Management Plan	Plan goals include reducing urban flooding
2012	Berkeley Unified School District moves administrative offices	Moved out of seismically-unstable Old City Hall building and into newly-renovated building on Bonar and University
2012	Ratcliff Building retrofit complete	Retrofits made possible by \$2.89 million FEMA grant
April 2012	Gas valve permit fee reduced	Permit fee for valve installation reduced. Established \$50 flat rate permit fee for voluntary installation of gas shutoff valves in 2+ residences on a block.
2012	Dona Spring Animal Shelter opens	New animal shelter designed to governing seismic standards
2012	North Branch Library and Claremont Branch Library retrofits complete	Libraries seismically retrofitted to governing standards, fire sprinkler system added
2013	South Branch Library replaced	New building meets seismic codes, photovoltaic panels offset energy grid draws
January 2014	Soft story Phase II Ordinance takes effect	Owners of soft, weak or open front buildings with five or more dwelling units required to retrofit their buildings within the next five years
2014	Fire-OES establishes Dumpster Program	Program incentivizes communities to meet on disaster readiness topics
August 2014	South Napa Earthquake	President Obama declares a Major Disaster

