EARTHQUAKE PREPAREDNESS:

ACTIVITIES COMPLETED AND FUTURE EFFORTS

A Brief Summary of Progress and Planning at the City of Seattle

June 2010

Title Page Photo:
May 23, 2001. Cadillac Hotel and Phoenix Underground Earthquake Damage. Seattle Municipal Archives Photograph Collection.

EARTHQUAKE PREPAREDNESS

INTRODUCTION

Earthquakes are Seattle's biggest threat due to the combination of magnitude and frequency. The City of Seattle is actively preparing to respond to a catastrophic earthquake. Key efforts include strengthening critical infrastructure, building community preparedness, increasing employee preparedness and emphasizing individual preparedness. This report gives an overview of some of those completed and planned activities.

ACTIVITIES COMPLETED

STRENGTHENED CRITICAL INFRASTRUCTURE

OEM

- Adopted the Seattle All-Hazards Mitigation Plan 8 in July 2009.
- Developed seven earthquake projects totaling $8.4 million in estimated project costs for competitive grant application since February 2004 when the original Seattle All-Hazard Mitigation Plan was adopted.
    - Two awarded funding and completed (South Lake Union Armory Seismic Retrofit Project and Gas Shut Off Valves Project)
    - One eligible but not awarded (King St)
    - Two awarded funding and underway (QA Community Center, Post Alley)
    - Two in State/FEMA review for funding award (Fire Station 14, Jefferson Park Community Center).

Earthquake Hazard Mitigation Projects

Project Title	**Funding Source**	**Award Date and Status**	**Estimated Cost**	**Reimbursements Received To Date**
Low-Income Homes Seismic Retrofit	Hazard Mitigation Grant Program HMGP – DR 1361	Jan 2003	$1,000,000.00	$875,000.00

FFD

New Construction

- Replaced seismically unsound city buildings that provide critical services with construction that complies with current seismic codes.
    - Rebuilt the Municipal Building as City Hall in 2005

  - Rebuilt the Public Safety Building as the Justice Center in 2001.
  - Built the West Police Precinct in 1999.
  - Built the South Police Precinct in 1983 and renovated it in 1991.

Facilities and Emergency Response Program Projects (aka "Fire Levy")

Background

- Funded by $167 million levy passed in 2003 by 69% of Seattle voters
- Includes rebuilding or upgrading 32 neighborhood fire stations to better withstand earthquakes and ensure that the city's emergency responders are available to help when they are needed most, plus other infrastructure projects.
- Biggest undertaking in the last 40 years to upgrade, replace and modernize fire stations and emergency response, is already helping Seattle make tremendous progress on getting prepared.
- About six building projects underway at a time.

Buildings Completed

- Re-opened the renovated and expanded Fire Station 41 in Magnolia in February 2010.
- Opened the new Fire Station 28 in Rainier Valley in December 2009.
- Re-opened the seismically upgraded/improved Fire Station 33 in Rainier Beach in September 2009.
- Re-opened the seismically upgraded/improved Fire Station 31 in Northgate in April 2009.
- Opened the new Fire Station 10, Fire Alarm Center, and Emergency Operations Center in the International District in early 2008. The new joint facility housing all of these functions provides both the Fire Department and the city's Office of Emergency Management with state-of-the-art facilities that are built to essential function standards
- Constructed a new Joint Training Facility that opened in 2007. This facility allows first responders from all departments to conduct class room and field training to become more proficient in emergency response missions.

Buildings Nearly Completed

- Fire Stations 2, 17 and 35 are on schedule for completion by 10/31/10.

Boats and Emergency Caches Purchased

- Added two new fireboats to the fleet to boost the Fire Departments capacity to attack and/or contain vessel fires or that could threaten mooring facilities or other fires along shorelines.
  - The flagship Leschi, delivered in 2007
  - The smaller fire and rescue boat, Engine 1, went into service in 2006.
- Provided an emergency water supply for fighting fires. Hardened hydrants at city reservoirs to allow firefighters to draw water directly from Puget Sound or other close by water reservoirs should hydrants or water distribution lines become inoperable.
- Purchased supplies and created four emergency caches around the city of Seattle.
  - Assistance for 3,500 displaced people who may seek shelter in an earthquake or widespread disaster.

- Contents include cots, blankets, shelter kits, nurse kits and emergency radios.
- Discreetly located in Magnolia, North Seattle, Central/Southeast Seattle and West Seattle.

Earthquake Hazard Mitigation Projects

Project Title	**Funding Source**	**Award Date and Status**	**Estimated Cost**	**Reimbursements Received To Date**
Automatic Gas Shut-off Valves (40 city-owned facilities)	Hazard Grant Mitigation Program HMGP – DR 1671	Sep 2008 – completed	$200,000.00	$78,998.00 (additional payment of $6,032.00 expected)
Fire Station 14 Seismic Retrofit	Pre-Disaster Mitigation Competitive Grant Program PDMC – 2010	Eligible, being reconsidered for funding	$1,159,200.00	

Assessments

- Identified where the city would benefit from directing its efforts and resources
- Resulted in the city's advocacy for adoption of the particulars in the "Fire Levy."

Detailed seismic evaluations, recommendations and cost estimation

- 1996 by Schreiber & Lane
  - Fire Stations 8-10, 16, 18, 20, 24 and 41
- 1996 by Coughlin Porter Lundeen
  - Fire Stations 2, 11, 13, 26-30, 32, 36-37

Facilities Screening Studies

- 1993 by EQE
  - Seattle Public Library selected branches
  - Seattle Center Facilities
  - Dept. of Parks & Recreation facilities
  - DAS (since divided into Fleets and Facilities, the Department of Finance, and the Department of Information Technology and most recently consolidated into Department of Finance and Administration).

Detailed Seismic Evaluations

- 1992-1995 by EQE
  - Community Centers
  - Seattle Public Libraries
  - Police Stations

        - Fire Stations
        - Seattle Aquarium
        - Traffic Operations Center Sign Shop (aka Sunny Jim warehouse)
        - other city buildings, substations and service shops

Studies of Non-Structural Components

- 1992-1993 by EQE
    - City Light
    - Seattle Public Libraries
    - Seattle Parks and Recreation
    - Seattle Center

DPD

Building Codes and Policies: Overview

- The Department of Planning and Development helps ensure that buildings are built to code.
- Seattle's building code is intended to protect people, rather than buildings, so people are able to safely exit building following an earthquake.
- DPD staff work with national and state code development committees to help ensure state-of-the-art standards for Seattle's building codes, which are updated on a three-year cycle.
- Seattle's building code standards are consistent with national standards that vary by:
    - Geographic area and seismicity of region
    - Soil type at a particular site
    - Use of building (e.g., single family residence versus a theater versus a hospital) accounts for ground shaking anticipated from a mega-quake in Puget Sound region.
- Buildings in Seattle must be designed to comparable earthquake criteria as buildings in California; owners may build to a higher standard.

Seismic Upgrade Policy

- Best time for requiring seismic update is when an owner is upgrading a building for other purposes.
- Intent of seismic upgrades is to reduce the chance of building collapse in an earthquake
- Seismic upgrades are not intended to bring a building up to current codes.

Home Retrofit Program

- The home retrofit program has trained 15 contractors in 2010 and resulted in more than 2000 home retrofits.

Seismic Repair Policies

- Nisqually Earthquake in February 2001 prompted changed policies for repairing earthquake damage.
- As adopted, those changed policies generally require upgrades of the most damage-prone building elements (e.g., parapets and chimneys).

- Changes are expected to greatly reduce damage to these most damage-prone elements in the next earthquake.
- Other policies trigger upgrades to structures that were more heavily damaged in the earthquake.

Unreinforced Masonry (URM) Study

- Commissioned study because URM buildings are the most likely type of building to be damaged during an earthquake because they lack steel reinforcements to help tie the bricks together.
- Reviewed seismic policies for several California cities to identify lessons learned.
- Reid Middleton published their findings in 2007.
    - The estimate of 800-1,000 URM structures in the city raises public safety concerns.
    - URMs are buildings commonly seen in many areas of city, such as Pioneer Square, Columbia City and Capitol Hill.
    - URMs crumbled along First Avenue South during the Nisqually Earthquake.
- DPD responded by leading development of policy recommendations to address public safety concerns presented by URMs.
- DPD invited two public-private advisory committees to help develop retrofit strategy.
    - The Technical Committee is considering thresholds for compliance, engineering standards for the upgrades.
    - The Policy Committee is considering timeline for compliance, incentives, penalty for non-compliance and financing options.
    - Basic Question: Should city require life safety standards of buildings be improved even if not significant remodel is being undertaken?
    - Challenge: To determine appropriate retrofit requirements to meet both objectives for safe communities and helping preserve neighborhoods.
        - Do not want to "encourage" demolition.
        - Do not want to "encourage" vacant, unused buildings.

Emergency Role: Overview

- Response Phase: Rapid assessment of damaged buildings to determine if they are safe to occupy.
    - Conduct ACT 20 assessments.
        - ACT 20 references Applied Technology Council assessment/form used.
        - Based on 20-45 minute walk around and through buildings.
        - Evaluates risk to life safety from hazards.
        - Adds barrier tape for hazardous areas.
        - Attaches placard to building to inform owner and occupants of hazards and restrictions.
            - Red = unsafe to enter
            - Yellow = limited entry or use
            - Green = no apparent hazard
        - Legal authority to place ATC-20 placards resets with DPD.

  - Evaluate city buildings as planned with FFD.
    - Facilities personnel conduct initial ATC-20 evaluation.
    - Hang "advisory" placards.
    - Report red and yellow tags to DPD asap.
    - Report green tags on regular schedule.
    - DPD will follow-up on red and yellow reports, place "official" placards.
  - Once past city priorities, DPD responds to buildings on a "complaint basis."
    - Concentrate first on identified priority buildings (e.g., hospitals, fire and police stations, schools, etc.).
    - Teams perform ATC-20 evaluations.
      - If unsafe to occupy, post to vacate (Red Tagged).
  - Gather data for overall situational awareness.
- Recovery Phase: Get city functioning quickly.
  - Emergency repair permits for structural damage get priority and go to the head of the line.
  - After Nisqually, DPD hired a consultant to focus on review, inspections related to EQ => expedited process for emergency repairs.
  - Allow continued processing of "regular" work to help economic recovery.

Staffing Post-Earthquake Inspections

- In a large event, DPD does not have enough staff to evaluate buildings and will be overwhelmed.
- Need help via mutual aid, volunteers, private sector engineers.
- Identified need for legislation to allow mutual aid in Washington.
- Plan to utilize credentialed volunteers through King County Emergency Worker Program.
- Began process to plan for owner-hired engineers to report ATC-20 results to DPD.

Communicating and Managing Expectations

- Hardware: post-earthquake communication devices needed.
- Important to educate public, manage public expectations before and during response.
  - Peter Yanev article in New York Times posted by King5 on 4/16/09 raised concerns.
    - "…in cities like Seattle…hardly any building is designed to withstand such a huge [megaquake as Cascadia]."
    - "Seattle's buildings…are designed for roughly half of the earthquake loads of buildings in San Francisco or Los Angeles."
    - "In a mega-quake, many of the [Pacific Northwest's] iconic tall buildings would probably collapse."
  - Structural Engineers Association of Washington (SEWA) responded with strong disagreement to some of Yanev's statements.
    - Modern codes take Cascadia event into account.
    - Buldings are designed to comparable earthquake loads as those in California.

        - The impression created that there are dangerous deficiencies in tall buildings designed to modern codes is "unjustified."
    - Yanev clarified in KING5 report that he is mostly concerned about pre-1970s high rise buildings.
    - Based on Chile and Mexico City's earthquakes, older 10-15 story buildings are at risk of major damage.
        - "Damage" does not necessarily mean collapse.
    - There are no "earthquake-proof" buildings.
        - Earthquake resistant, yes.
        - Code mitigates hazard in a reasonable, economic way.
        - Code's focus is life safety, i.e., getting people out of the building.
- Provide public information on:
    - Meaning of ATC 20 placards
    - How long to get buildings evaluated
    - How evaluations can be expedited
- During response, provide and publicize a call-in number to report damage.
    - Explorations beginning on using other social media to collect damage reports.

SDOT

Earthquake Hazard Mitigation Projects

Project Title	**Funding Source**	**Award Date and Status**	**Estimated Cost**
Post-Alley Seismic Retrofit	Hazard Mitigation Grant Program HMGP – DR 1682	Eligible and funded	$1,000,000.00
King St Station Seismic Retrofit	Pre-Disaster Mitigation – Competitive Program PDM – C - 2009	Eligible but not funded.	$6,960,238.00

Seismically Retrofitting Bridges

- In 2005, completed retrofitting of the North Queen Anne Drive Bridge using FEMA mitigation funds.
- In 2007 began Bridging the Gap (BtG) initiative.
    - Funding provided by BtG, a nine-year transportation levy for maintenance and improvements passed by Seattle voters in 2006.
    - Construction began in 2009; completion is planned for 2015.
    - Bridges being retrofitted are:

- Albro over Airport Way
- Fauntleroy Express Way
- Ballard Bridge
- 4th Avenue, Jackson to Airport Way
- 2nd Avenue Extension
- Airport, 4th Avenue to 5th Avenue
- South Jackson Street, 4th Avenue to 5th Avenue

Planning for Seawall Replacement

- Began design work to replace the seawall adjacent to the Alaskan Way Viaduct.
- This early design work will advance the project timeline by 1 ½ years once funding for the project is identified.

SPU

Water System Infrastructure

- Facilities Strengthened
  - Tanks strengthened:
    - Magnolia
    - 2 in Richmond High
    - 2 Myrtle elevated tanks
  - New standpipes
    - Charlestown standpipe
    - Queen Anne standpipe
- Buildings Strengthened
  - Operations control center
  - Warehouse
  - Carpentry shop
  - 4 pump stations
  - Landsburg treatment building & screen house
  - Lake Youngs Chlorination building
  - Control Works
- Pipelines Strengthened
  - West Seattle
  - Pipeline
  - Cedar River Pipe Lines at Ginger Creek
  - Tolt PL No 1 bridge
  - Mercer Island Pipeline backup pipe on I-90 bridge
- Dams Strengthened
  - Lake Youngs Inlet Dam built as backup to Cascades Dam
  - Tolt intake tower & walkway & reservoir outlet valve control
  - Tolt Regulating Basin South Dam
  - Liner in Greenlake Reservoir

Water System Modeling

- Model system and effect of earthquake
- Determine effect of fires using Hazus
- Estimate business losses from water interruption
- Model effect of different mitigation measures & determine most effective ones

Water Mitigation Measures

- Used valves to isolate some of SPU's water tanks and reservoirs so that broken pipelines don't completely drain the tanks and reservoirs
- Installed hardware and/or developing procedures to isolate areas of significant pipeline damage so these areas do not drain the system
- Used flex hose (blue hose) to bridge broken mains and/or extend into areas without sufficient water pressure to fight fires
- Seismically upgraded those facilities found to be vulnerable in the study that have not already been upgraded
- Included seismic vulnerability as a consideration of asset management decisions on pipeline and facility replacement
- Seismically hardened hydrants that draw directly from 8 reservoirs:
    - Beacon
    - Myrtle
    - Lincoln
    - Magnolia
    - West Seattle
    - Roosevelt
    - Maple Leaf
    - Bitter Lake
- Emergency water distribution systems
    - >5000 of portable pipelines used to bridge damaged water mains or establish temporary service points
    - 6 blivet and manifold systems to supply temporary water to the public in aseptic 1-gallon plastic bags

Hardened Hydrant at Beacon Reservoir (above). Blivet provides portable water (below)

Solid Waste

- Current transfer stations do not include any significant seismic resistance. As stations are replaced or upgraded, seismic resistance is a significant component of the design, both for safety of staff and public occupying the facility, and to ensure the ability to continue to operate and receive debris.
- Debris Management Plan is in place to manage the collection, staging and disposal of debris produced by an earthquake and the following response. The plan is coordinated with the respective solid waste agencies in King, Pierce, and Snohomish Counties.

General Planning

- Engineering staff conduct system damage and capability assessments according to an infrastructure assessment plan.
- Field and engineering staff respond to critical facilities, such as dams, to assess damage and public safety risks.
- Critical SPU services have alternate/backup facilities:
    - Operation Response Center (24-hr dispatch) – backup at North Operations Center
    - Water System Control – 1 primary, and 2 secondary alternate sites
    - Tolt Dam Warning System – alternate control from NOC and at Tolt (to be completed 2010)
    - IT backup servers
    - Critical records vault

DoIT

Infrastructure/Mitigation Projects

- Telephone and Data Networks have three small generators and three large generators always fueled and ready to deploy.
- There is a truck ready to pull the big generators into position
- The communications rooms have been seismically braced, i.e., equipment has been secured to keep it from falling or moving around during a quake.
- On Call Technicians are able to remotely dial in to monitor and repair systems, when possible. (Telephone Analysts can no longer work remotely).
- Replaced two old radio towers in Northeast and West Seattle to meet current building code requirements, including building seismic requirements for this region.
- Added one generator at Radio Communications Shop and replaced three generators at Northeast, West Seattle and Capitol Hill locations.
- All Radio communications equipment is seismically braced within the building facility.

DPR

Earthquake Hazard Mitigation Projects

Project Title	**Funding Source**	**Award Date and Status**	**Estimated Cost**	**Reimbursements Received To Date**
South Lake Union Armory Seismic Retrofit	Pre-Disaster Mitigation Competitive Grant Program PDMC – 2005	Nov 2005 - completed	$713, 229.00	$534,922.00

Project Title	Funding Source	Award Date and Status	Estimated Cost
Queen Anne Community Center Seismic Retrofit	Hazard Mitigation Grant Program HMGP – DR 1671	Aug 2008 Funded, in progress	$780,000.00
Jefferson Community Center Seismic Retrofit	Hazard Mitigation Grant Program HMGP – DR 1817 & 1825	Sept 2009 In review	$1,371,918.00

Facilities and Emergency Response Program Projects (aka "Fire Levy")

- Purchased and installed emergency generators to power life support at six community centers designated as emergency shelters in a disaster:
    - Bitter Lake
    - Meadowbrook
    - Queen Anne
    - Garfield
    - Delridge
    - Rainier Beach

BUILT COMMUNITY PREPAREDNESS

HSD

Aging and Disability Services: Preparing Vulnerable Populations

- Aging and Disability Services (ADS) has strategically worked to prepare over 5,000 clients and 16 contracted home care agencies in Seattle and King County in case of a disaster where clients' normal support might not be readily available.
- These activities included:
    - Secured funding from Public Health – Seattle & King County to conduct an earthquake preparedness tabletop exercise in June 2008 for all 16 contracted King County home care agency directors and selected staff, as well as key ADS staff.
    - Worked with all home care agency directors to identify criteria for high risk clients using an electronic assessment database.
    - Agreed upon a basic disaster response plan with home care agency directors to be used with ADS in case of a major disaster.
    - Provided training for home care agencies regarding the potential for Green River Valley flooding due to either earthquake damage to the levee system or the inability of the Howard Hanson Dam to operate at full capacity in the event of heavy extended rainfall.

  - Provided all 1,300 ADS Case Management Program clients residing in the Green River Valley with emergency preparedness flyers translated into multiple languages.
  - Provided 400 of the Green River Valley clients with safety kits in case of evacuation
  - Provided a separate 400 clients with food bags for emergencies that will provide three days of meals.

Continuity Planning for Essential Community Partners

- $500,000 received from City Council in 2008 to assist city-funded human service programs and agencies that provide essential services agencies to be more resilient and better able to continue key services through a disaster.
  - Included 49 agencies offering homeless services, food/meal programs, case management services, domestic violence shelter and elderly/senior services, e.g.,
    - Asian Counseling and Referral Services (ACRS)
    - El Centro
    - Catholic Community Services
    - Sold Ground
- Contracted with Public Health – Seattle & King County to help participating agencies develop Agency Emergency Plans.
- Funding also purchased emergency supplies.
- Partnership efforts by HSD and Public Health continued into 2009.
  - Offered support to the agencies that had completed an Agency Emergency Plans
  - Offered assistance to agencies that had declined participation or had not been able to complete the program in 2008.

OEM

Continue Neighborhood and Individual Preparedness Programs

OEM will continue to promote family and neighborhood preparedness activities through its SNAP (Seattle Neighborhoods Actively Prepare) and neighborhood hub programs. Additional SNAP classes will be offered in 2010 and 2011. Efforts are also ongoing to expand the neighborhood hub program to more areas of the City. For more information on SNAP and the neighborhood hub program go to http://www.seattle.gov/emergency/prepare/neighborhood/.

Preparedness Education and Campaigns

OEM will continue to promote its education to individuals through campaigns in 2010. One ongoing campaign called "3 to Get Ready," includes not only the City of Seattle, but also King County and media partners KIRO FM and MyNorthwest.com. OEM has three persons dedicated to public out reach who continually push earthquake education as a part of their ongoing outreach efforts to various groups including non-english speaking and special needs populations.

INCREASED EMPLOYEE PREPAREDNESS

The most fundamental role for government is to provide for the safety of its citizens. When an emergency or disaster exceeds the capacity of traditional responders, all city employees may need to help. Employee preparedness refers to the readiness of employees to help, either in planned

roles or where needed. This section gives an overview of some departments' employee preparedness efforts and activities.

OEM

- Coordinated planning and training efforts and built team response through regular meetings with department emergency planners.
    - Weekly Strategic Work Group meetings
    - Monthly Disaster Management Committee meetings
- Developed and presented classes required for department responders to the Emergency Operations Center, i.e.,
    - Basic EOC Training
    - Intermediate EOC Training
    - Advanced EOC Training
    - WebEOC Training
    - Position-Specific Training for Logistics and Planning Section EOC responders

PERS

- Expanded New Employee Orientation to 90 minutes instead of 15 minutes, as of March 2010.
    - Curriculum development was a partnership between the Personnel Department and the Office of Emergency Management.
    - Interactive session asks about expectations/response in familiar work situations (e.g., receive call that child is ill at school) expanding to disasters when not at work.
    - Includes content on the Seattle Disaster Readiness and Response Plan and its collaboration matrix.
    - Emphasizes the importance of every employee as an emergency responder, i.e.,
        - An EOC Responder and/or
        - A Department Essential Function Responder or
        - An Unassigned Responder.
    - Responsibilities for presenting the training transferred to OEM from Personnel.
- Began review of the New Supervisor Orientation curriculum on employee preparedness, which continues to be 15 minutes at this time.
- Developed and published "Emergency Preparedness is for Everyone," a 2-fold color brochure, with support from OEM.
    - Initial distribution is limited and staged to obtain feedback.
    - Plans are to make the brochure available to all employees.
- Created, published and promoted a "how to" guide for entering federally mandated, National Incident Command System training into the citywide Human Resources Information System (HRIS).
    - Entry in HRIS makes these trainings part of the employee's training record.
    - Employee training records are portable within the city and searchable citywide.
- Offered employees the opportunity in the Seattle Municipal Tower to see and buy preparedness items and kits
    - Planned and promoted popular sales events once in 2008 and twice in 2009.

  - Supplies provided by city vendor were available at a discount to city employees
  - Supplies included a solar-powered NOAA radio, crank flashlights, gloves and other kit items; prepared kits of various sorts for varied budgets; long-lasting, high calorie food bars, etc.
  - Office of Emergency Management set-up and staffed an education table during the vendor sales.

SPU

- Continued annual field crew drills on staff accountability and response if an earthquake were to happen while on shift.
- Staged Continuity of Operations Plan (COOP) exercise in August 2009 that lasted three weeks.
  - Exercise served as a model for other departments, was presented to multiple city audiences
  - Exercise overview was presented at 2010 Partners in Preparedness Conference

SDOT

- Initiate employee disaster preparedness responsibilities through department new employee induction briefing.
- Reinforce employee personal and family preparedness through quarterly safety/disaster preparedness briefings
- Continually improve employee emergency response proficiency and preparedness through monthly exercises and drills

DoIT

- Held mandatory disaster training in 5/2006 & 7/2007.
- Continued quarterly review of earthquake/disaster plan with telephones and data staff.
  - The format is, "We just had an earthquake, what would you do?"
  - Each person responds to two scenarios: earthquake during work hours and after hours.
- Developed and distributed emergency call out telephone wallet cards.
- Created emergency procedures and distributed them to staff.
- Provided desk disaster kits to all current employees and started providing kits to new employees when they are hired.

HSD

- Provided responder training to department's Emergency Response Team.
  - Thirty-three completed a two-hour training on 11/17/09 and 12/2/09.
- Included a one-hour training on responder roles in a disaster during the 10/21/09 All-Staff Meeting.
- Enhanced the department's new employee orientation by adding the City of Seattle Disaster Preparedness DVD and personal emergency preparedness information.

DPR

- Trained 180 employees in Red Cross training for mass care shelter workers.
- Developed plan to expand that number by assigning and/or recruiting additional DPR employees, city employees and volunteers affiliated with a local non-profit organization.
- Completed plans for a "train-the-trainer" model whereby the Red Cross would train an employee on training for shelter operations at their Red Cross standard, so that future shelter trainings could be conducted by a city employee.

FAS

- Trained about one-third of a planned 40-45 employees to conduct "advisory" evaluations of city buildings after an earthquake.

SELECT CITYWIDE ACTIVITIES

Federally Mandated NIMS/ICS Trainings

- Training is required according to responder role(s), enables a common paradigm and language.
- Departments identified and tracked completion of who is required to complete National Incident Response Management (NIMS)/Incident Command System (ICS) courses.
    - Federal funding is predicated on compliance with training requirements.
    - Basic and many other courses are offered online; advanced courses for most EOC responders are conducted in a classroom setting.
    - Departments report compliance with training requirements annually in September to OEM, which in turn submits a training compliance report to the federal government.

Emergency Support Functions (ESFs)

- Collaboration matrix of which departments participate in which ESFs is described in Seattle's Disaster Readiness and Response Plan.
- Department representatives meet, coordinate and plan under the Emergency Support Function umbrella to support city essential services.

Floor Wardens

- Fill important role of the everyday, at-work emergency responders.
- Training and activities are conducted in cooperation with building management.
- Floor Warden programs and activities vary by department, with general focus on office workers.
    - Help staff respond appropriately to emergencies in the buildings.
    - Lead emergency drills.
    - Conduct light search and rescue.
    - Conduct employee size-up in response to an emergency.
    - Attend building safety training offered by building management
    - Obtain and maintain First Aid/CPR certification.

Annual April Earthquake Drill

- Departments and employees participated in Washington State's annual April earthquake drill, giving employees a close look at the carpet under their desks or where their options to "drop, cover and hold" or go "beneath, between or beside" are located.
    - Participation generally focused on office workers.
    - Extent of activities beyond "drop and cover" varied by department.
        - Advance preparation and preparedness materials
        - Size-up to identify "who's where" and account for everyone
        - Hazard inspections by Safety Committee members
        - Testing preparedness kit materials and resupplying perishables, as needed
        - Follow-up and discussion/documentation of lessons learned

FUTURE EFFORTS

STRENGTHENING CRITICAL INFRASTRUCTURE

FAS (FORMERLY, FFD)

Proposed Capital Improvement Plan for 2009-2014

Identifies investments for the future projects that will mitigate various types of exposures that currently exist and that can be remediated by upgrading, restoring and rebuilding of the City's capital assets:

- Continue funding and completion of the remaining 26 "Fire Levy" projects.
- Identify funding source for Fire Station 14 Seismic Retrofit
    - Submitted to the Hazard Mitigation Grant Program for $3,034,342.00
    - Eligible, currently being reconsidered for funding.
- Identify funding to upgrade or rebuild the Harbor Patrol building on Lake Union.
- Assess and plan for expected upgrade or replacement of Charles Street Shop.
- Replace Fire Station 5 on the seawall.
    - Requires funding plan to rebuild it or complete seismic upgrades.
- Determine plan for Fire Station 22, which is contingent on final plan for Washington State Route 520.
    - Rebuild or relocate, based on 520 plan.
    - If relocating, determine whether to continue to include it as a fire levy project and plan for adequate funding.
- Identify funding to upgrade or rebuild the North Precinct on existing or new site.

DPD

Unreinforced Masonry (URM) Study

- Complete development of policy recommendations to address public safety concerns regarding Seattle's many Unreinforced Masonry structures.

- Present resulting programmatic recommendations to City Council for consideration.
    - If adopted, Seattle would be the first city outside California to enact such a retrofit requirement.

Owner-Hired Engineer Reports

- Increase capacity to conduct post-earthquake damage inspections by completing plans to recognize owner-hired engineer reports of ATC-20 post-earthquake damage.
- Develop new procedures in coordination with the Structural Engineers Association of Washington (SEAW) and Building Owners and Managers Association (BOMA).
- Agree upon parameters by which DPD would recognize "Advisory Tags" posted by ATC-20 trained private engineers.
    - "Advisory Tags" would be coded green, yellow or red.

SDOT

Bridging the Gap

- Complete retrofitting of seven bridges now underway as part of the Bridging the Gap (BtG) initiative.
    - Albro over Airport Way
    - Fauntleroy Express Way
    - Ballard Bridge
    - 4th Ave, Jackson to Airport Way
    - 2nd Ave Extension
    - Airport, 4th Ave to 5th Ave
    - South Jackson Street, 4th Ave to 5th Ave
- Completion is scheduled for 2015.

Post-Alley Seismic Retrofit

- Project currently at the 60% design stage
- Project start is forecasted to be December 2010
- Conservative completion forecast is January 2012

King Street Station

- Identify alternative funding source for King Street Station Seismic Retrofit.
    - Eligible but not funded when submitted for $6,960,238.00 to Hazard Mitigation Grant Program.

Seawall Replacement

- Complete efforts to secure the city's funding for work with King County to replace the seawall adjacent to Elliott Bay as part of the Alaska Way Viaduct replacement project.

DPR

Seismic Upgrade

- Complete seismic upgrade of Queen Anne Community Center.
    - $780,000.00 awarded August 2008 through Hazard Mitigation Grant Program (HMGP – DR 1671)

BUILDING COMMUNITY PREPAREDNESS

OEM

Seattle Neighborhoods Actively Prepare

Continue Seattle's neighborhood preparedness program called SNAP – Seattle Neighborhoods Actively Prepare. This program is designed to help neighbors organize to take care of each other following a disaster. For more information, go to www.seattle.gov/emergency and click on SNAP.

General Preparedness Campaigns

Continue educational efforts. OEM educates individuals through on-going efforts and preparedness campaigns, like the one recently completed as part of the annual April Washington State Disaster Preparedness month.

- "3 to Get Ready" campaign

  To jump-start preparedness efforts, participants were asked to take the "preparedness challenge." The "3 to Get Ready" campaign ran from April 5 to May 7, 2010. Participants were asked to complete three simple preparedness steps:

  1. Store emergency drinking water
  2. Establish an out of area contact for you and your family
  3. Practice drop, cover and hold

  Once this was completed by the individual, the challenge was get three others to do the same. After that, participants registered on-line and received a "3 to Get Ready" t-shirt, whistle and keychain flashlight. Information was posted at: www.seattle.gov/emergency as well as on local news blogs.

- Continue education efforts to immigrant/refugee communities and other vulnerable populations. Effectively using limited OEM resource through a "train the trainer" approach has been well-received by community leaders in several parts of the city. Conducting staff training for non-profits, daycare, school and business employees also foster individual preparedness efforts.

HSD

- Continue work with Public Health – Seattle & King County to increase resilience of non-profit agencies in a disaster through the development of Agency Emergency Plans.

- Complete development of a Disaster Case Management Plan for the city to help people access assistance after being impacted by a disaster.
    - Public Health – Seattle & King County built on the city's draft plan and recommendations as the basis for its six-month project to develop a Disaster Case Management coalition and a Disaster Case Management manual.
    - When this county project is complete in June 2010, HSD will build on it to complete the City's Disaster Case Management Plan and continue to work with the coalition on additional recommendations.

INCREASING EMPLOYEE PREPAREDNESS

Educating employees on the city's plan, their department's essential functions, their specific role and the importance of all employees in the response is on-going. Continued efforts within departments, including individual conversations between a supervisor and employee, are fundamental.

EXAMPLES OF DEPARTMENT EFFORTS

- Train employees in emergency response; provide written expectations and tools, e.g.,
    - Emergency Preparedness is for Everyone brochure (See handout attached)
    - Call out/wallet cards
    - Department-specific plans for employee response
    - Seattle's Disaster Readiness and Response Plan (overview of concepts)
- Continue to promote personal preparedness, including opportunities to purchase emergency supplies discounted for city employees.
- Offer First Aid/CPR training, as possible, especially to EOC and Department Essential Function Responders.
- Provide basic disaster kits, as possible.
- Increase department-to-department collaborations, e.g., on Floor Warden and size-up activities.
- Participate in local and regional exercises to plan, practice and update activities related to supporting department essential function, e.g., SoundShake 2010 Aftershock!
- Complete entry of NIMS/ICS and other emergency preparedness training in the citywide Human Resources Information System (HRIS).
    - Eliminate all tracking in any side system, e.g., Excel, Access or paper records.
    - "Clean-up" existing HRIS data to comply with "How to NIMS" data entry guide.

CITYWIDE EFFORTS

The possibilities for citywide planning to increase employee preparedness are tempered by limited resources. Two, however, perhaps merit further conversation.

Annual April Earthquake Drill

- Make the drill mandatory for all city employees.
    - Include employees working in the field or on shift at times other than the 9:45 a.m. statewide drill time.

- Adopt a script for the drill, to make the public address announcement beginning and ending the drill more informative and evocative. (Personnel and OEM have drafted a script for this purpose.)
- Include size-up practice to identify who's where and report on employee availability for staffing plans.

Citywide Fall Event: "Emergency Preparedness is for Everyone"

- Revive planning for a fall series of events for all employees that provides presentations and activities on different days, places and times.
- Develop a proposal to implement ideas developed by an informal interdepartmental team over their several meetings, key departments include, but would not be limited to:
    - OEM, Personnel, Customer Service Bureau, Legislative, Human Services and Parks and Recreation.
- Include existing material that can be readily included or easily adapted, such as:
    - New Employee Orientation
    - New Supervisor Orientation
    - Presentations from the 2010 Partners in Preparedness Conference:
        - Politics, Preparedness and George Costanza (Cheryl Brush, Customer Services Bureau)
        - Making ICS Classes Fun, Practical and Meaningful (JoAnn Jordan, OEM)
- Include personal preparedness information and emergency supplies sales by the city's vendor.

ATTACHMENTS

EMPHASIZING INDIVIDUAL PREPAREDNESS

A truly effective response and recovery from a disaster relies heavily on whether or not the general population is prepared to be self-sufficient during the time when first-response agencies are overwhelmed. Bottom line: Preparedness saves lives and improves a speedy recovery.

What can you do now, before a quake?

☑ Be prepared to be on your own for a minimum of three days. For life safety essentials like water and medications, prepare for longer, if possible.

Prepare yourself and your family with the basics of what you would need to be safe, healthy and comfortable:

- Water – at least one gallon per person per day for a minimum of three days
- Prescription medications
- Source of light such as battery or self-powered flashlights, glow sticks (avoid candles)
- Battery-operated radio
- First aid kit
- Food
- Warm clothes and blankets

What do I put my kit in and where do I put it?

- Put your kit in something that you can "grab and go," like a backpack or suitcase on wheels. Put it somewhere in your home where you'll likely have easy access to the kit, such as a front hall closet. Consider keeping smaller kits in your car or in your workplace.

☑ Create a communications plan with your family.

Identify a person who lives out of Washington to be your point of contact after the earthquake. Long distance lines will be more reliable than local lines. Your out-of-area contact will be the person everyone in your family will call to relay information through.

Please stay off all phones for a minimum of three to five hours, unless you need 911 for a life-threatening emergency. Don't call anyone; focus on helping yourself and those around you following the earthquake.

Text messaging may also be a reliable form of communications following an earthquake; however, there may be a delay in receiving text messages, due to the system being heavily used.

What should you do in the event of a quake?

- ☑ When the ground starts shaking, take cover under a nearby desk, table or counter top. Drop, cover and hold till the shaking stops.
- ☑ After the shaking stops, check to make sure you are OK. Check on those around you to make sure they are OK, and help as needed.
- ☑ Control small fires with fire extinguishers, if you can do that safely.
- ☑ Control utilities as needed – only turn off the natural gas if you need to (meaning if you smell natural gas or hear hissing).
- ☑ Stay off the roads to allow emergency vehicles access for emergency response and damage assessment.
- ☑ Listen to the radio for emergency and safety information.

Create a Work Go-Kit

If delayed or taking shelter at work, what would help keep you safe and comfortable? Store a few items in a box or bag.

- Non-perishable, high-protein foods (e.g., energy bars, peanut butter, trail mix and canned and dry food)
- Water and juices
- Gloves, sturdy shoes or boots and a change of clothing for warm and cold weather

- Blanket, wrap or sleeping bag
- Whistle, facemask and flashlight plus batteries, if not crank operated
- Prescription drugs and eyeglasses
- Toothbrush, toothpaste, floss, comb, deodorant, soap, washcloth, towel, etc.

Disaster Communications

The phone system will most likely be unavailable, almost always due to overuse.

- Plan with your loved ones to stay off all phones for 3-5 hours, except for 911 calls. Reserve phones for lifesaving.
- Brief text messages are okay before phone calls. Text, but expect delays.

After a disaster, long-distance phone lines and texting may be more reliable than local phone lines.

- Plan with your loved ones to call or text someone who lives far from here. This out-of-area contact can be a go-between and share information back and forth with loved ones.

Tune in to emergency broadcasts.

- Radio: 97.3 FM, or AM 710 or 1000
- TV: KING-5, KIRO-7, KOMO-4, KCPQ-13 or Seattle Channel–21
- Web Access: www.seattle.gov

What do I need to do?

Make a Plan - Build a Kit - Get Involved

Preparedness Resources

The Seattle Office of Emergency Management (OEM) offers many publications and easy-to-use online materials. These help people take care of themselves after a disaster or emergency.

Go to **http://www.seattle.gov/emergency** and browse OEM's public website. It has city plans, hot topics and an online calendar describing:

- SNAP (Seattle Neighborhoods Actively Prepare) classes
- Home retrofitting classes
- Skills training in disaster first aid and search and rescue
- How to join radio communication teams
- How to join OEM's mailing list

Go to **http://www.seattlechannel.org/** and search "preparedness video" to find a personal and family preparedness video available in many languages.

Reach OEM by phone at **(206) 233-5076**.

Personnel

Building your Career and your Community

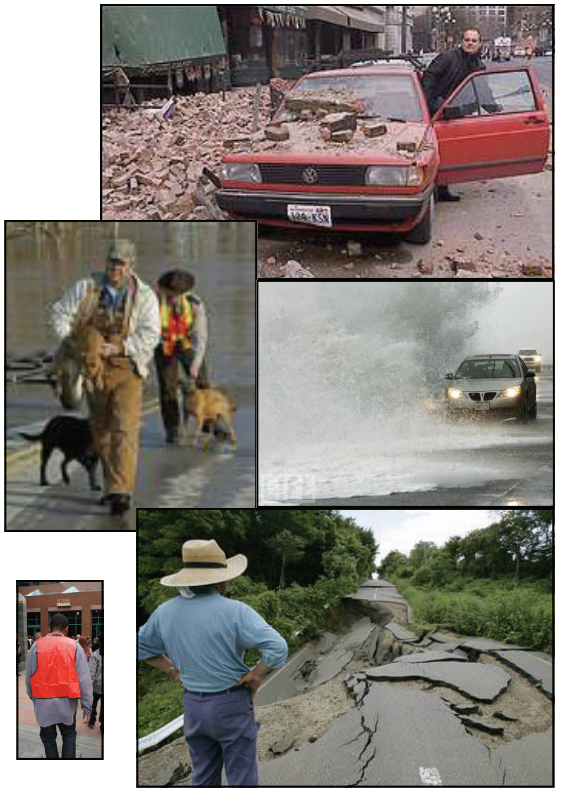
Seattle Emergency Management

Disaster Ready...
Prepared People,
Resilient Community

Produced by the Personnel Department, in cooperation with the Seattle Office of Emergency Management. Printing courtesy of the Seattle Office of Emergency Management.

4/20/10

City of Seattle



Emergency Preparedness Is for Everyone

A brief guide for people who work at the City of Seattle

Purpose of this Brochure

1. To encourage action that increases employee preparedness both at home and at work.
2. To identify basic information that employees need to know about their workplace in an emergency.
3. To promote the Seattle Office of Emergency Management (OEM) and use of its many preparedness resources.

Why Prepare for a Disaster?

Some say the Seattle area is likely to have a moderate to major disaster in the near future. Disasters are difficult to predict. Their consequences, however, are not.

Earthquakes are the largest and most complex disasters Seattle could face. People who are prepared for an earthquake are generally ready for other events that could disrupt city services, such as severe weather, power outages and terrorist acts.

At the City of Seattle, all departments plan for emergencies so they can reorganize and collaborate to meet essential needs.

During a disaster, the Emergency Operations Center coordinates information and resources and develops a citywide action plan. All plans assume employees will help; disaster management takes a lot of people.

Whatever your work, emergency preparedness is for everyone. If your department does not need you right away, you may be reassigned to a different supervisor or department that needs help. In any case, plan ahead and plan to help.

Wondering what your supervisor expects or how your workgroup and department might reorganize? Discuss work needs and your situation with your supervisor.

Begin with the Basics

Each time you begin an assignment with a new supervisor or move to a new workspace, learn the basics.

- To reach my supervisor, what work phone number should I use? Is it a desk or cell phone? If phones are out, what alternative(s) should I try?
- What does my supervisor expect me to do if an emergency happens?
- Are my emergency contacts in Employee Self-Service current?
- Which co-workers are trained in CPR/First Aid?
- Where are emergency supplies?

If you work in a building:

- Who are my Floor Wardens?*
- Where is my nearest emergency exit? Where are additional exits?
- Where do I go to evacuate? To take action to be safe where I usually am?
- What is the emergency phone number for building security?

If you work in the field:

- Talk and plan with your supervisor.

* If you have or develop a condition that would limit your ability to evacuate, tell your Floor Warden or supervisor and plan for a buddy to help.

During a Disaster

When a disaster happens, services will likely be overwhelmed. Phones may not work. Bridges and roadways may be damaged and dangerous.

It will take time to learn the disaster's impacts. Reports may change based on new information.

In a large event—like the earthquake this area expects someday—expect chaos and casualties. Also expect to be self-sufficient until disabled support systems get restarted.

- Stay where you are unless hazards dictate moving to a safer area.
- Follow the directions of your Floor Wardens and designated emergency responders.
- Take care of yourself and those around you.
- Make 911 calls to save lives and then stay off all phones for 3 to 5 hours to prevent overload/failure.

- Hang up any telephone handsets that have been shaken off their receivers.
- Follow your department's procedures and work plan to report your status to work. If your plan is to phone, first reserve phones for life saving calls, whenever possible.

SEATTLE'S FIRE LEVY PROGRAM AT A GLANCE

In 2003, 69 percent of Seattle voters approved the Fire Facilities and Emergency Response Levy. As part of the biggest undertaking in the last 40 years to upgrade, replace and modernize fire stations and emergency response, the program scope includes:

- Renovating or replacing 32 neighborhood fire stations.
- Constructing a new training facility, fire alarm center, and emergency operations center.
- Installing emergency generators at community centers.
- Establishing emergency supply caches in four quadrants of the city.
- Creating an emergency water supply system for firefighting after a disaster.
- Adding two new fireboats to the fleet and renovating an old fireboat.

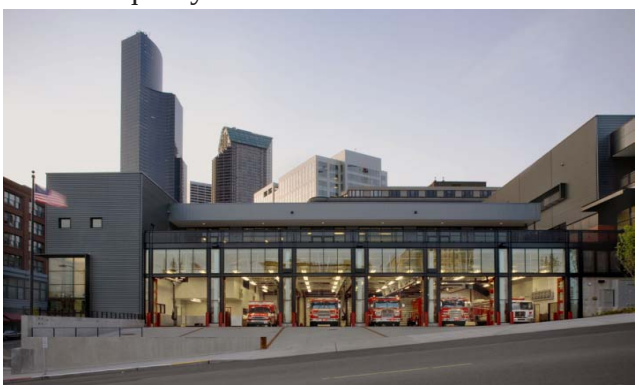
The projects are designed to make Seattle safer in an emergency – and every day. Funding for the Fire Levy comes from property tax revenue and other sources.

Sustainability

Fire Levy projects incorporate sustainability through participation in two programs: the LEED (Leadership in Energy and Environmental Design) program for larger projects; or the city's CapitalGREEN program for smaller projects.

New fire station projects participate in the LEED program, with the goal of Silver certification. Ten fire stations in the Levy program have been registered for LEED Silver certification. The Joint Training Facility and Fire Station 10 have received the rating. Sustainable strategies for Fire Levy projects include rainwater harvesting, rain gardens and native landscaping, green roofs, energy efficient mechanical systems, ground-source heat pumps, daylighting, improved indoor air quality, recycled content materials, and building commissioning for improved system performance.

Fire Levy seismic safety projects participate in the CapitalGREEN program. Five fire station projects currently use the CapitalGREEN program. Sustainable strategies include water conservation, drought tolerant landscaping, energy efficient mechanical systems, energy efficient lighting, and increased indoor air quality.



Fire Station 10

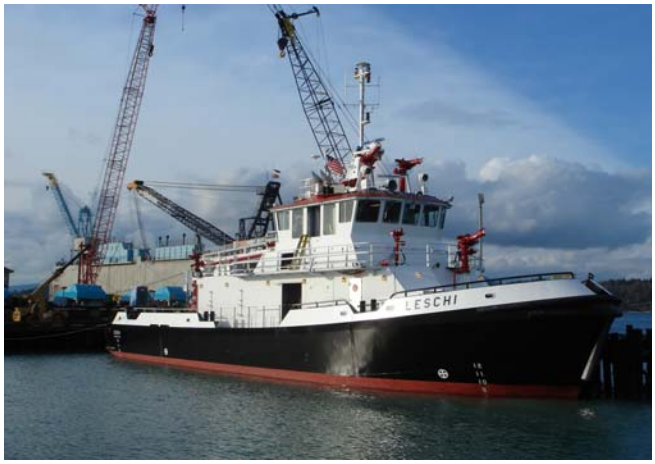
Completed Projects

- New Fire Station 10, Fire Alarm Center, and Emergency Operations Center.
- Two new fireboats, the flagship Leschi, and the smaller fire and rescue boat, Engine 1.
- New Joint Training Facility for firefighters and utility workers.
- New Fire Station 28 in Rainier Valley.
- Major renovation and expansion of historic Fire Station 41 in Magnolia.
- Seismically upgraded/improved Fire Station 33 in Rainier Beach.
- Seismically upgraded/improved Fire Station 31 in Northgate.
- Emergency water supply for fighting fires.
- Emergency supply caches at four locations around the City of Seattle.
- Emergency generators at six community centers.

Fire Station 10/Fire Alarm Center/Emergency Operations Center
The city's new Fire Station 10, Fire Alarm Center, and Emergency Operations Center, located in one complex at the southern edge of downtown, opened in 2008. The 60,333 square-foot complex is the largest project in the Fire Levy. The new Fire Station 10 replaced the station built in 1928, located in the liquefaction zone.

The EOC is the heart of the city's response to disasters and other major events.

The FAC houses the firefighters who answer 911 calls and dispatch the appropriate crews. The state-of-the-art technology and space in both the FAC and the EOC better allow the city to coordinate emergency response.



The Fireboat Leschi

Fireboats
To improve coverage on freshwater and saltwater, the fireboat fleet features two new vesels, the Leschi and Engine One. The new, 50-foot fireboat, Fire Engine 1, went into service in 2006. With a top speed of 26 knots, Engine 1 has the speed and agility to respond to any marine emergency. The 108-foot Leschi, completed in 2007, has a maximum speed of 14 knots and a pumping capacity of 20,000 gallons of water per minute, and the ability to fight large marine and waterfront fires. Once rehabilitated, the Chief Seattle will replace the Alki, built in 1928, as the primary freshwater fireboat.

Joint Training Facility
The Joint Training Facility, a new complex that opened in 2007, serves as a training location for the Seattle Fire Department and Seattle Public Utilities. The secure campus features a variety of training props, including a building for drilling in burning conditions and an area for practicing driving fire rigs.

Neighborhood Fire Stations
The program will upgrade, renovate, or replace neighborhood fire stations across the city, built between 1918 and 1974. Building or upgrading fire stations today will enable the city's fire facilities to withstand major earthquakes and other disasters in the future to ensure that the city's emergency responders are available to help when they are needed most. As Seattle became denser and taller, engines and trucks increased in size, resulting in crews outgrowing their stations. The upgraded, renovated, or new stations provide more space for equipment and operations such as decontamination.

In 2009, three neighborhood fire station projects were completed. The new Fire Station 28 in Rainier Valley houses one of the busiest engine companies in the city. Both Fire Station 31 in Northgate and Fire Station 33 in Rainier Beach received seismic upgrades and additions.

Emergency Fire Suppression Water Supply
Hardened hydrants installed at nine city reservoirs allow firefighters to draw water directly from reservoirs in an emergency. In addition, fire engines have been equipped with special hoses to draw water from lakes and Puget Sound.

Emergency Community Disaster Supplies
Located in four geographical areas of the city, Magnolia, North Seattle, Central/Southeast Seattle, and West Seattle, the caches contain cots, blankets, shelter kits, nurse kits, and emergency radios for distribution by emergency workers in the event of a disaster.

Emergency Generators
The city has installed mobile generators city-wide at six community centers designated as emergency shelters in a disaster: Bitter Lake, Meadowbrook, Queen Anne, Garfield, Delridge, and Rainier Beach.

STATE/FEMA FUNDED HAZARD MITIGATION PROJECTS: 1995 – 2010

Mitigation Project Title	Hazard	Award Date	Lead Department	Status
Completed:				
University Bridge Seismic	Earthquake	Aug-95	SDOT [Seattle Eng. Dept.]	Completed - Defaulted on funding
Myrtle Street Tanks Seismic	Earthquake	Aug-95	SPU [Water]	Not completed - Funding transferred
Bridge Six Seismic Project **	Earthquake	Aug-97	SeaTran	Completed
Fire Station 2 & 18 Seismic Retrofit	Earthquake	May-97	ESD [Facilities]	Completed
Duwamish Head Stabilization Project	Landslide	Mar-99	SPU [DWU]	Completed - Won engineering award!
North Queen Anne Dr. Bridge Seismic Retrofit	Earthquake	Aug-02	SDOT	Completed
Low Income Home Seismic Retrofit	Earthquake	Jan-03	SPD/OEM	Completed
South Lake Union Armory Building Seismic Retrofit	Earthquake	Nov-05	Parks	Completed
Gas Shut Off Valve Project	Earthquake & Fire	Sep-08	FFD	Grant awarded; contract signed ; project underway
Queen Anne Community Center Seismic Retrofit	Earthquake	Aug-08	Parks	Grant awarded; contract signed ; project underway
In Progress:				
Post Alley Areaway Seismic Retrofit	**Earthquake**	**Oct-10**	**SDOT**	**Grant awarded; contract signed ; project underway**
Urban Flood Hazard Identification Project	**Urban Flooding**	**TBD**	**SPU**	**Forwarded by State for FEMA review**

Funding source notes:
HMGP = Hazard Mitigation Grant Program. State/FEMA funding generated from Presidential Disaster Declarations.
PDMC = Pre-Disaster Mitigation Competative Grant Program. FEMA funding made available for national competition.

** For Jose Rizal, Admiral Way and Fairview Avenue Bridges