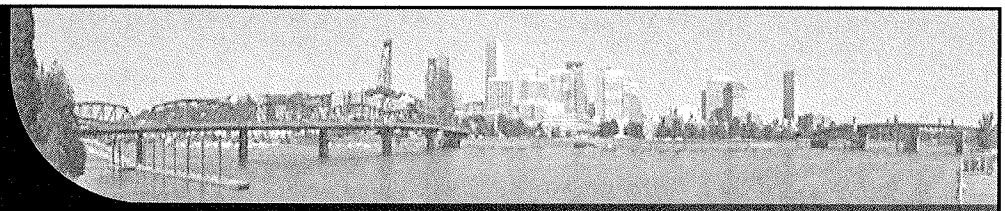

City of Portland

Earthquake Response Appendix

April 2012

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PBEM

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Front photography: Downtown Olympia, Washington following February 28, 2001 Nisqually earthquake.

I. INTRODUCTION

A. Purpose

The purpose of this hazard specific appendix is to provide a consistent and flexible framework for Portland City government, regional partners and private entities to work in a coordinated manner in response to a large magnitude earthquake.

B. Scope

This Appendix supplements the City's Basic Emergency Operations Plan (BEOP) by describing how the City will respond to, and begin recovering from, a strong earthquake. This Appendix applies to all City bureaus, staff and elected officials and acknowledges the City alone cannot respond to the myriad challenges posed by a significant seismic event. The City depends on its strong partnerships with public and private sector organizations and the general public to develop a resilient community able to withstand any emergency.

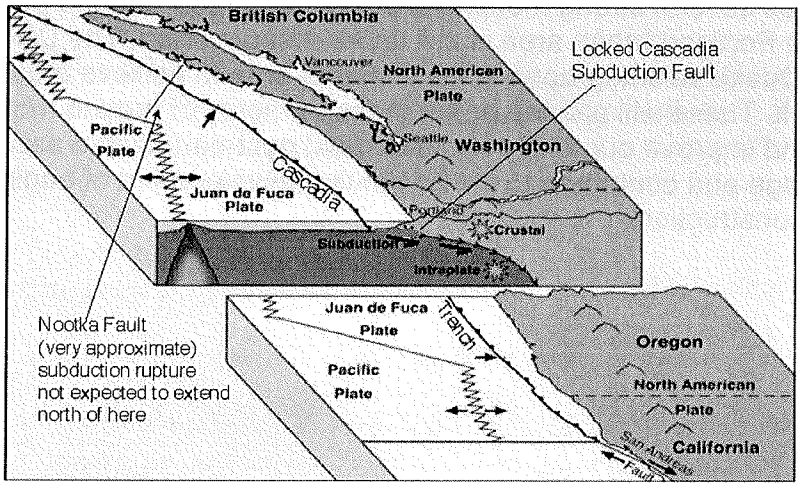
This Appendix is intended to provide enough flexibility to meet uncertain and changing conditions.

C. Limitations

The City endeavors to make every reasonable effort in response to an earthquake and related hazards. However, resources may become overwhelmed by the magnitude of the disaster. This Appendix is not intended to guarantee specific tasks will be done in any particular order or that the tasks will be done at all.

Figure I-1 Principal Earthquake Sources for Major Earthquakes in Oregon

II.



II. SITUATION

Off the coast of Oregon lies a deep sub-sea trench, east of which the Juan de Fuca oceanic plate is slowly moving (subducting) beneath the North American continental plate. The area along which the oceanic and continental plates are currently accumulating stress is a fault that extends 50-100 miles east from the trench, possibly further east beneath Oregon at the latitude of Portland. At intervals of hundreds of years on average, accumulated stress on this fault causes it to rupture in a catastrophic earthquake. An earthquake rupturing the entire 600 miles from Cape Mendocino to southern British Columbia would have magnitude (M) 9.0 or greater, and geologists have found evidence of at least 40 great Cascadia earthquakes during the past 10,000 years ranging in size from M 8.0 to over 9.0. The last great Cascadia earthquake occurred on January 26, 1700. Looking at all 40 of these great quakes, scientists have determined that 75 percent of these Cascadia subduction zone earthquakes have occurred, on average, less than 300 years apart. We are now well within the period to experience another similar earthquake. Regardless of average return periods we cannot predict when earthquakes will happen. The random nature of earthquakes lends urgency for the need to prepare now.

The City also straddles three identified crustal faults that stretch the length of Portland: the Oatfield Fault west of the northwest hills; the East Bank Fault, traversing the Willamette into Oregon City and the Portland Hills Fault which runs parallel to Forest Park into downtown Portland. Each of these crustal faults is capable of generating moderately large earthquakes of M 5.0-6.8.

A. Earthquake Monitoring

There is a network of seismic sensors throughout the Pacific Northwest. The Pacific Northwest Seismic Network (PNSN) currently has several strong motion sensors in the Portland area but none are in the downtown core. The United States Geological Survey (USGS) also has several strong motion sensors throughout Portland but compared to other cities, the Portland urban area is still under-instrumented. The USGS is about to deploy 10 NetQuake seismographs in the Portland area to achieve a denser and more uniform network. These will provide better measurements of ground motion during earthquakes and improve our ability to make rapid post-earthquake assessments of expected damage and contribute to the continuing development of engineering standards for construction.

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Photo to be added at a later date.

Most of the City's transportation, water, sewer and telecommunications infrastructure, as well as private sector energy transmission and distribution systems, were built prior to an understanding of the Pacific Northwest's seismic risk and are susceptible to earthquake triggered damage.

B. Transportation Infrastructure

1. The Portland Bureau of Transportation (PBOT) owns and maintains 159 bridge structures in addition to elevated sidewalks, stairways, retaining walls, and the Harbor Wall. The Harbor Wall, which runs along the west side of the river beginning at the Steel Bridge and continuing to just past the Hawthorne Bridge, protects the downtown core from Willamette River flooding. PBOT's 2010 Asset and Condition Report finds that 54 percent of PBOT's bridge structures are considered to be in good or better condition while 18 percent are considered to be in poor or very poor condition. Currently, 25 of PBOT's bridges are weight restricted. Additionally, most of PBOT's bridge structures have not been designed to resist earthquakes and could collapse in a moderate seismic event. PBOT has worked to strengthen and upgrade some of its bridges including the North Going Street Bridge to Swan Island, the East Ramp to the Steel Bridge and the North Lombard Street Bridge over the Columbia Slough. The Portland Bureau of Transportation was also successful in acquiring state and federal funding to replace some of the poor and weight restricted bridges. Newly replaced bridges include: NE 33rd over Columbia Slough, NE 33rd over Lombard Street, SE Foster Road over Johnson Creek and N Vancouver Avenue over the Columbia Slough. All new replacement bridges meet current bridge standards for seismic design.

2. PBOT's main operations and equipment storage site is located beneath the eastside approaches of the Fremont Bridge, which is expected to suffer significant damage during a large earthquake.

3. The Harbor Wall, constructed in the 1930s, may be vulnerable to lateral spreading from unstable liquefiable soils; however, no formal study of the Harbor Wall has been performed.

4. The City has developed and tested a post earthquake bridge inspection program to ensure that its bridges are inspected for safety following an earthquake. This is a program that has been developed in conjunction with Multnomah County and the Oregon Department of Transportation (ODOT) to help ensure that all of the bridges within the City limits are inspected following an earthquake.

5. Approximately 9% of collector and arterial streets are in poor or very poor condition, 30% is fair and 61% is in good or better condition. Collectors and arterials carry freight, transit and have the highest utilization by the traveling public. These streets deteriorate from these heavy loads and usage.

6. Multnomah County maintains and operates the Burnside, Broadway, Hawthorne, Morrison and Sellwood Bridges spanning the Willamette River in Portland. Only the Burnside Bridge has received a Phase I seismic retrofit, in part due its status as a critical lifeline bridge for the Portland area. Damage to the counterweights on these bridges is highly likely thereby rendering them unable to be opened or closed.

7. ODOT owns and maintains the Ross Island, Marquam, Fremont and St. Johns Bridges spanning the Willamette River and the Interstate and Glenn Jackson Bridges spanning the Columbia River in Portland. Only the Marquam Bridge has received a Phase I seismic retrofit.

8. In November 2009, ODOT released the Seismic Vulnerability of Oregon State Highway Bridges: Mitigation Strategies to Reduce Major Mobility Risks. The study found that highway mobility would be severely reduced after a Cascadia subduction zone earthquake, as well as after a significant local crustal earthquake. Using an earthquake scenario of M 7.0 in the Portland metro area, the report estimates there would be five complete collapses, 48 structures with extensive damage and 41 structures with moderate damage. The overall survivability of all Portland area bridges during a significant earthquake is questionable given their age and design. Massive counterweights on the majority of drawbridges spanning the Willamette River as well as the Columbia River will sway during earthquake shaking, causing severe damage.

9. Many of the bridges also carry critical services including water distribution pipes, telecommunications and electrical lines across the Willamette River, which could break and disrupt service to various parts of the City.

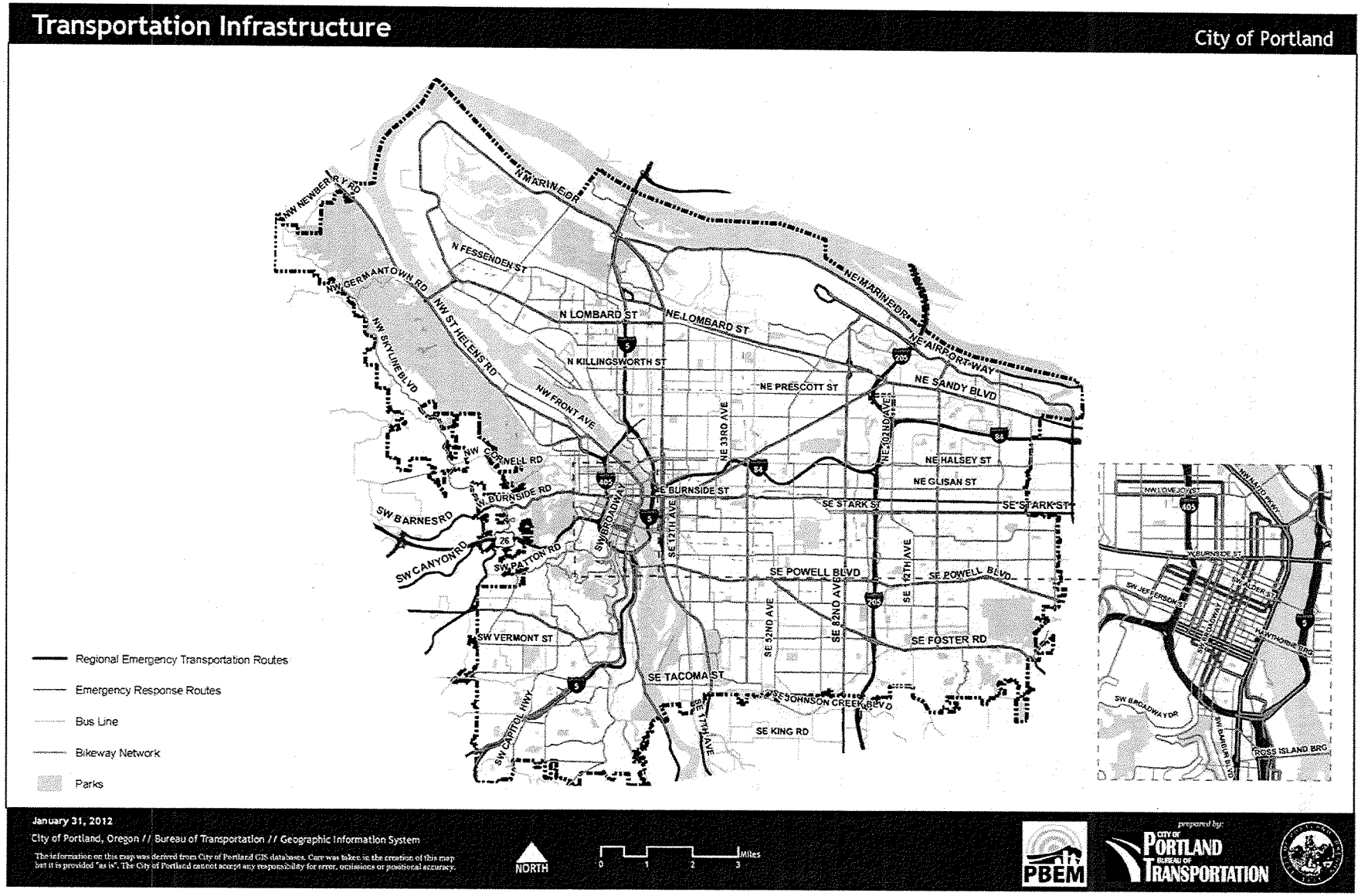
10. Union Pacific Railroad owns and maintains the Steel Bridge. Burlington Northern Santa Fe (BNSF) and Union Pacific Railroads operate major switching yards and locomotive facilities in Portland along the Willamette River. Industry switching for both BNSF and Union Pacific is performed at rail facilities located at Guilds Lake Yard in northwest Portland, an area built on artificial fill.

11. Designated emergency transportation routes (ETRs) utilized by emergency responders include vulnerable bridge structures that, if damaged or impassable, will impede emergency responders' ability to traverse the city.

12. The Port of Portland owns and operates Portland International Airport (PDX) as well as marine Terminals 2, 4 and 5 on the Willamette River and Terminal 6 on the Columbia River. PDX serves 13 million passengers and transports 200,000 tons of air cargo annually. The Portland harbor exports the largest volume of wheat in the United States and is the largest auto import gateway on the West Coast. The airport and marine terminals are built on liquefiable soil and are protected from flooding by levees maintained by the Multnomah County Drainage District.

13. River transportation is controlled by the US Coast Guard. In a large scale emergency, they will determine the closure of river traffic and subsequently the closure of bridges spanning the rivers.

Figure II-3 Transportation Infrastructure



C. Water Infrastructure

1. The Portland water system is susceptible to earthquake shaking which will damage water pipelines, reduce water flow/pressure, inhibit firefighting abilities and threaten public health. The Portland Water Bureau has conducted assessments of high pressure pump mains, pipes on bridges, pipes under freeway and railroad crossings and in key operational areas.

2. The Water Bureau operates and maintains two dams in the Bull Run watershed, 75 miles of steel conduits from the Bull Run Watershed to Mt. Tabor, the Powell Butte terminal storage reservoir, six Willamette River crossings, five open distribution storage reservoirs at Mt. Tabor and Washington Parks, 32 storage tanks, pump stations, approximately 2,000 miles of distribution piping, the Columbia South Shore Well Field with 32 wells, storage tank and transmission lines, and numerous building facilities. Some of these assets are more than 100 years old and many are at high risk of damage from a seismic event. The Bureau supplies water to more than 800,000 retail and wholesale customers in the region.

3. The Columbia South Shore Well Field (CSSWF) is an emergency backup supply when the Bull Run water becomes unavailable from turbidity or other causes. After the Bull Run Watershed, it is the second largest water supply in Oregon.

4. The Bull Run dams are evaluated on a five year interval and have a low vulnerability. However, the Bull Run Watershed is vulnerable to landslides. The three (#1, #2 and #4) conduits that carry water from Headworks at Bull Run to Mt. Tabor range in age from 58 to 100 years old and are subject to damage from landslides and shaking. A landslide in November 1995 damaged conduits #2 and #4, which cross the Sandy and Bull Run Rivers. To mitigate this vulnerability, the Water Bureau relocated the conduits – which used to traverse an 1894 steel bridge – in a tunnel underneath the Sandy River. The Sandy River Crossing project now safeguards the Bull Run conduits at this site.

5. Simultaneous multiple failures of the Bull Run system and the groundwater well field facilities would severely compromise the City's ability to provide water and emergency measures would be necessary. Specific vulnerabilities of the water infrastructure include:

    a) Groundwater Supply – the buildings and tanks are subject to collapse. Wells and collection piping are subject to damage from liquefaction.

    b) Conduits/Transmission – key supply piping is subject to damage from shaking, landslide and liquefaction. Shaking is most likely to impact conduits on trestles and bridges. Some of the trestles have been

replaced with buried pipe, especially along Conduit 4. Landslides are most likely to impact pipelines downstream of Bull Run and in the Portland Hills. Liquefaction is likely along the Columbia and Willamette Rivers and the six Willamette River crossings are at high risk of damage and service disruption to the west side and downtown.

c) Treatment – buildings and equipment, including hazardous chemical facilities, are subject to damage from strong ground shaking.

d) Storage – tanks are subject to connecting pipe damage. Some tanks may be subject to rupture; others may be subject to being separated from their foundations. A seismic evaluation study of many of the distribution storage tanks was performed in 1987. Several standpipes and elevated tanks were upgraded or abandoned as part of that analysis. The five open distribution storage reservoirs are more than 100 years old and are at high risk of significant damage during a large earthquake.

e) Pump Stations – buildings and equipment are subject to damage particularly from ground shaking and loss of power.

D. Wastewater Infrastructure

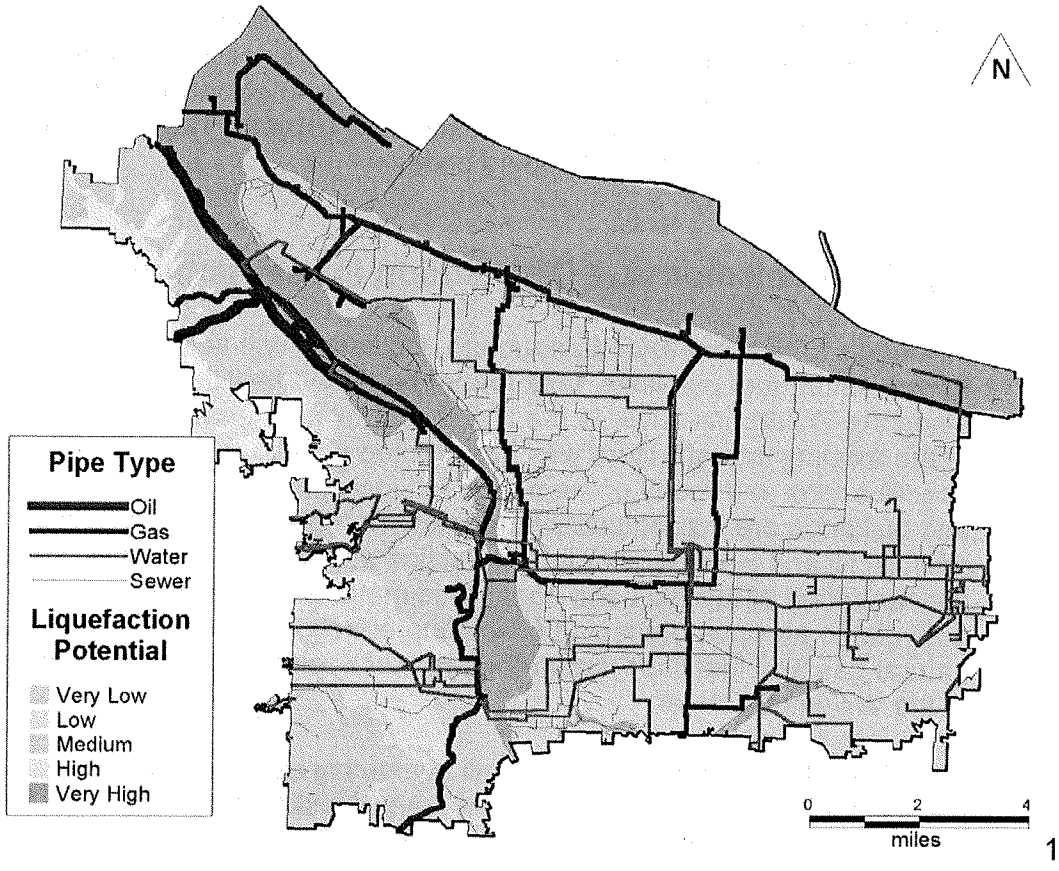
1. The Bureau of Environmental Services provides sewage and stormwater collection and treatment services to accommodate Portland's current and future needs. BES also protects the quality of surface and ground waters and conducts activities that plan and promote healthy ecosystems in the City's watersheds. The Portland sewer and stormwater system consists of two large wastewater treatment plants, 97 pumping stations and more than 2,300 miles of pipe (991 miles sanitary sewers, 883 miles combined sewers, 454 miles storm sewers). In addition, virtually all of the homes and businesses have a unique connection to the sewer system. These connections are called laterals. There are more than 172,000 lateral connections in the system. The City is responsible for the maintenance and repair of each lateral up to the curb line in the right-of-way or to the end of the tee/wye in an easement. There are more than 62,000 sewer access structures (manholes). Each structure is not just a cover on the pavement, but a constructed unit of the sewer system. The stormwater system is also extensive and varied, with many hundreds of facilities providing stormwater conveyance, storage and/or treatment of surface runoff.

2. Most of the larger pipes in the City's older neighborhoods are more than 100 years old. The Portland Plan Infrastructure Condition and Capacity Background Report notes that approximately 40 percent of the City's wastewater system is in very good condition. However, the Columbia

Boulevard Wastewater Treatment facility is built on liquefiable soils and could sustain significant damage during a large earthquake. The pipe rehabilitation program called the "System Plan" includes strategies to provide structural rehabilitation of critical combined and sanitary sewer that reach the end of their useful life and have the highest consequence of failure. Pipes have been prioritized based on their risk exposure so that those pipes with the highest benefit (risk reduction) to cost ratio are rehabilitated first. This priority list is updated once a year and the highest priority pipes proceed to design and construction.

3. Sewage Pumping Stations are also on a schedule averaging a rehabilitation or replacement every 25-30 years. When a station is rehabilitated, it is evaluated for resiliency. Typically a station will receive either an onsite standby generator or, for smaller less critical stations, a quick-disconnect for a portable generator. Larger or more critical pumping stations receive intermediate attention to evaluate and upgrade systems and equipment. Ankeny Pump Station is a critical facility located just south of the Burnside Bridge in Waterfront Park. A seismic evaluation was recently completed during the design stages of a rehabilitation project currently underway. The upgrade project is currently going into construction phase. There are some interior walls, beams and columns that are going to be reinforced with fiberglass type mesh for seismic resiliency. The project will also add an interior steel framework to reinforce the building.

Figure II-4 Distribution of Utility Lifelines in Relation to Earthquake Hazard



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1 FEMA Hazus

E. Telecommunications Infrastructure

1. There are three CenturyLink Central Offices in Portland – each serves as the trunk switching location connecting: (a) local area access, international and domestic long distance calls, (b) fiber rings in the metropolitan area and (c) interconnects with competitive local exchange carriers. These buildings were constructed prior to seismic building codes.

F. Energy Transmission and Distribution Infrastructure

1. Portland's critical energy infrastructure, including high voltage electricity transmission, fuel pipelines, tank farms, ports and facilities, is concentrated along the Willamette River in the NW Industrial and Swan Island areas. Much of the existing infrastructure was constructed prior to current seismic safety specifications and many of the petroleum storage tanks, piers, marine docks and buildings are inadequately hardened. This area consists primarily of artificial fill and is vulnerable to liquefaction and lateral spreading. The concentration of facilities and hazardous materials in this area has the potential to produce damaging cascading effects including fires from ruptured natural gas and fuel lines, hazardous material releases and debris blockage of the Willamette River.

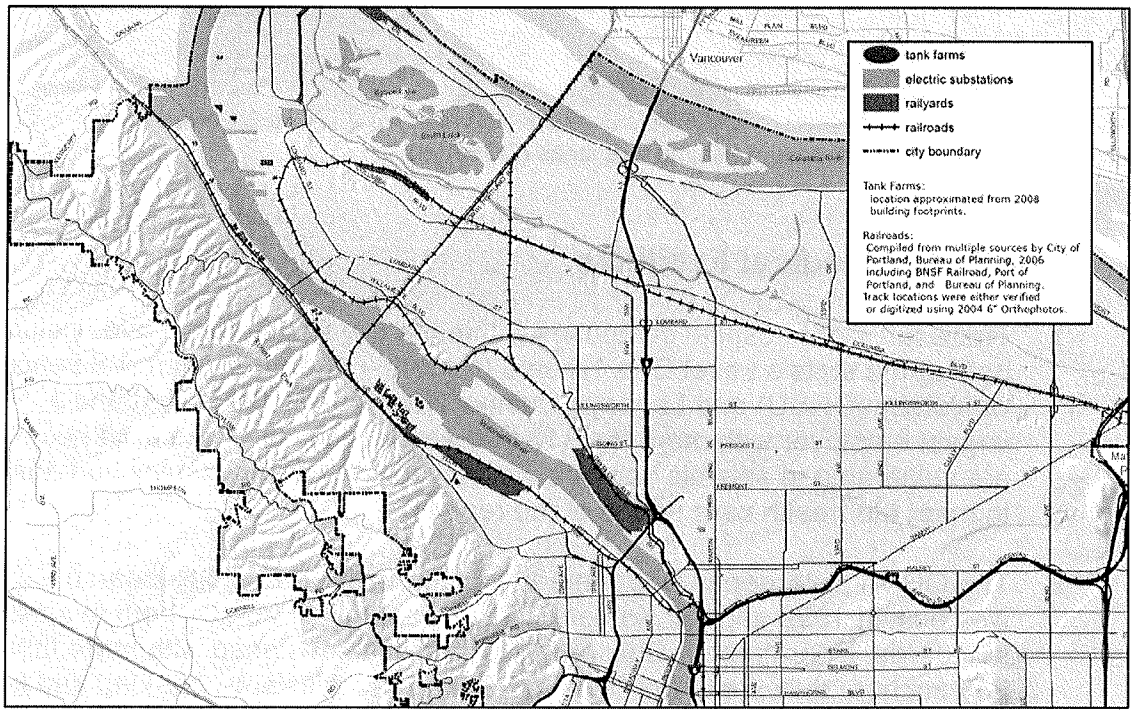
2. More than 80 percent of the crude oil eventually used in Oregon originates in the Alaska North Slope oil fields. The Trans Alaska Pipeline transports crude oil from these oil fields to the Valdez terminal. From there, barges, tankers and pipelines carry the crude oil to four refineries located in the Puget Sound area of Washington State. More than 90 percent of Oregon's refined petroleum product comes from the four refineries in the Puget Sound. About 75 percent of the product is transported via the Olympic Pipeline to eight petroleum distribution terminals located within close proximity of one another in the Port of Portland/Vancouver area. The remaining fuel is transported by tanker vessels to these facilities. Once the product reaches this hub, tanker trucks deliver fuel to customers in the Portland metro area[2].

2 Oregon Department of Energy – Oregon State Energy Assurance Plan, March 2011.

3. Portland fuel terminals are on a six-day delivery cycle. On average, terminals have a 3-5 day supply in the tank farm for regular unleaded gasoline and diesel fuel. Premium gasoline is subject to the daily delivery and heavily dependent on whether the intercompany pipeline on Front Avenue is operational. All seven Portland terminals have the capability to receive product by vessel. However, only Chevron and Kinder Morgan terminals have the marine vapor recovery systems required to load unleaded fuel onto vessels for transport up the Columbia River to Pasco, Washington. Diesel can be loaded on vessel without the vapor recovery systems. Vessel deliveries by vessel vary. Chevron reports on average, its terminal receives a shipment by barge every three or four days and by ship every seven or eight days.

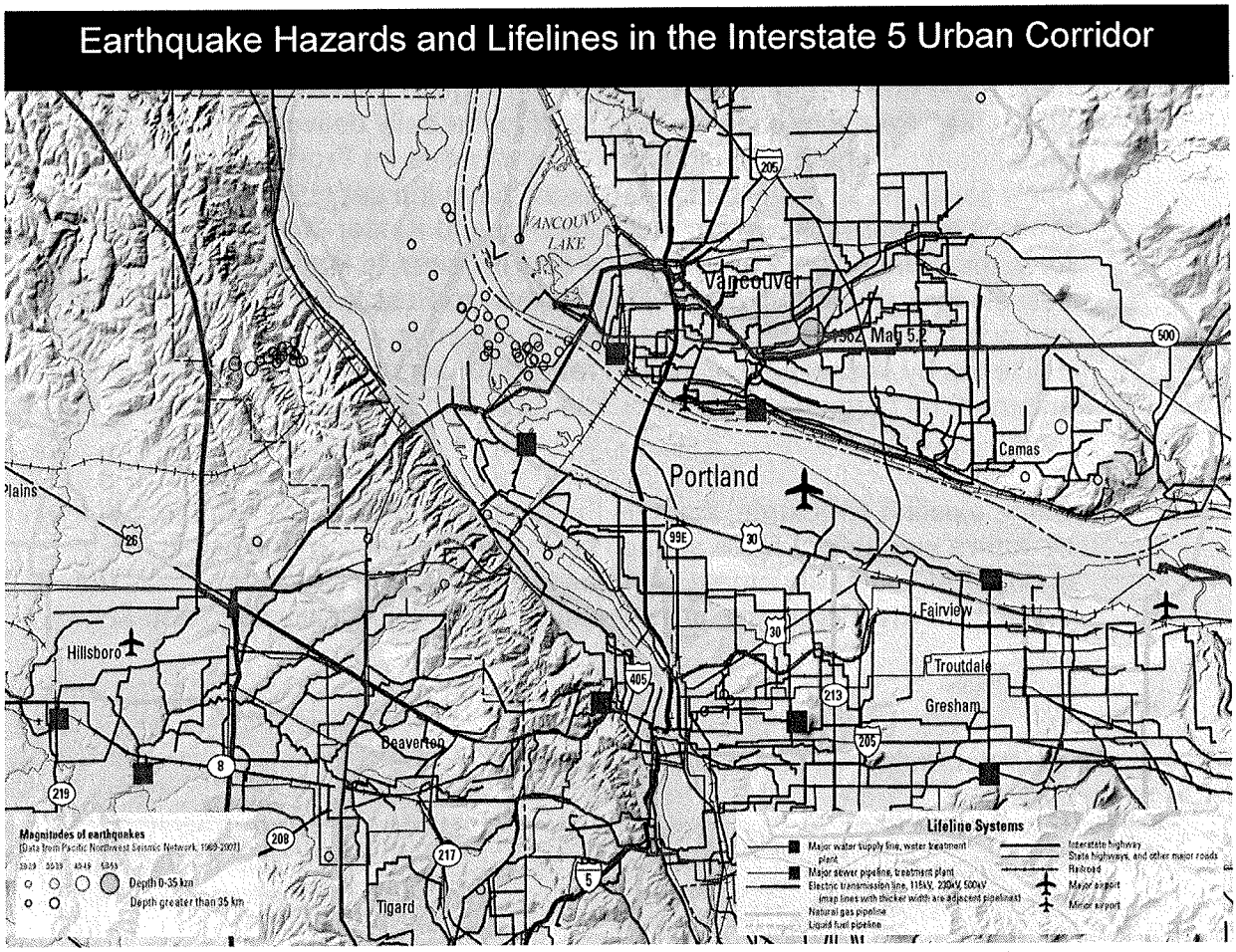
4. Some existing structures, such as the high voltage BPA transformers in the St John's substation, have already been strengthened with seismic anchorage. Other structures, such as the BPA transmission towers at the Willamette River crossing, are scheduled to be seismically mitigated in 2012.[3]

Figure II-5 NW Industrial Area Vulnerable Infrastructure



3 DOGAMI Energy Assurance Plan preliminary Findings: Energy Sector – Wang, Yumei 2011.

Figure II-6 Earthquake Hazards and Lifelines in the Interstate 5 Urban Corridor



Source: Department of Geology and Mineral Industries (DOGAMI)

G. Health and Medical Facilities

1. There are eight hospital campuses within the city limits of Portland, including both of the state's Level One Trauma Centers – Oregon Health & Science University (OHSU) and Legacy Emanuel Hospital. OHSU is Portland's largest employer with more than 13,600 employees. All of the area hospitals are vulnerable to seismic damage which would result in a diminished ability to meet the health care needs of the region.

2. The OHSU Emergency Department, located in the Hatfield Research Center, was built in 1999 and the Kohler Pavilion was built in 2008 – both to seismic standards. Doernbecher Children's Hospital was designed with more than 200 anchors drilled into the basalt hillside to resist seismic shaking and keep the building stable. OHSU completed a seismic renovation at their west campus administration building in 2010. In March 2012, OHSU completed Hospital South C-Wing seismic upgrades.

H. Public Schools (K-12)

1. Every school district in Portland (Portland Public Schools, David Douglas, Centennial, Parkrose and Reynolds) with the exception of Riverdale contains schools with features that suggest they may present structural hazards in an earthquake; in some cases, this includes a very high probability of potential collapse.

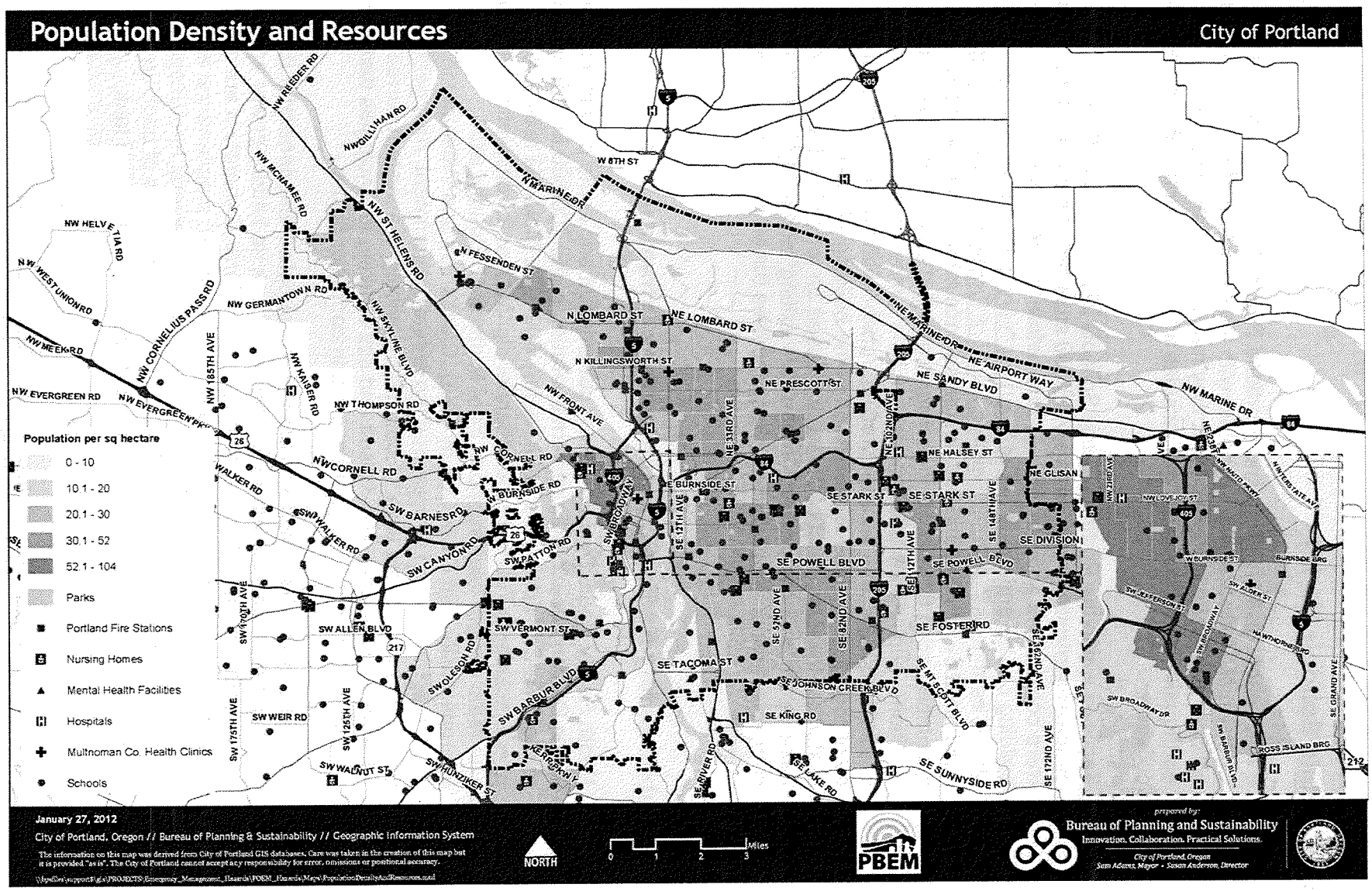
2. Facilities within the Portland Public Schools District include 89 school campuses enrolling approximately 46,000 students. Almost all of the schools were constructed prior to 1960 – years before the development of modern building codes, and many are at "high" or "very high" risk of collapse in a strong earthquake. A 2009 Seismic Study of Existing School Facilities conducted by KPFF found that limited seismic rehabilitation work was accomplished in 63 schools including: bracing of unreinforced walls and partitions, adding new brick veneer anchors, chimney removal or bracing, unreinforced masonry parapet bracing, rehabilitation of floor and roof diaphragms, and some rehabilitation of the building lateral force resisting systems. However, most of the work focused on retrofitting the greatest hazards for "collapse prevention and safe exiting" and did not result in complete seismic rehabilitation of any facilities based on current design criteria.

I. Public Safety Radio Communications Infrastructure

1. Public Safety Radio System – Most government and some private agencies within Portland use a radio system operating in the 700/800 MHz frequency range. The City operates a public safety 800 MHz Motorola radio system which includes a 700 MHz four-channel digital layer for encryption capability. The radio system itself supports all of Multnomah County, with interoperability with Clark County (WA), Clackamas and Washington Counties, the State of Oregon and the federal government. All together, the system supports more than 11,000 radio devices. The system currently has full trunking capability, with failsoft and site trunking technologies that serve as backup protection in the event of main controller failure.

2. Repeater towers have uninterrupted power supplies and generator capacity. The five simulcast sites have eight hours of back up battery power and on-site generators with a 500-gallon propane fuel tank. Generators are designed to be operable for five to seven days with no support; maintenance and refueling contracts are set up as priority contracts. Several IntelliRepeater sites also have uninterrupted power supplies, eight hours of back up battery power and on-site generators with a 500-gallon propane fuel tank.

Figure II-7 Population Density and Resources



III. PLANNING ASSUMPTIONS

A large magnitude earthquake will overwhelm the City's response capabilities and will immediately escalate the activation of the City's emergency coordination center (ECC) to an emergency operations center (EOC).

A. A Cascadia subduction zone earthquake will affect three states and two countries, impacting the availability and allocation of mutual aid assistance and further requiring close interagency coordination to ensure the appropriate prioritization of critical resources. Additional resource assistance will likely come from outside the state, if not the Pacific Northwest region, using the interstate Emergency Management Assistance Compact (EMAC) agreement.

1. Multnomah County will request regional and state resources but resource availability will depend on the location of the earthquake's epicenter and the impact to neighboring jurisdictions. The State of Oregon and FEMA Region X's capability to respond will be compromised.

B. Transportation, water, sewer, telecommunication, energy transmission and distribution systems and other critical infrastructure systems will be severely damaged and may not be functional for days, months or years. Damage to these critical systems will also become a significant limiting factor for hospitals, care facilities, fire suppression and rescue efforts.

C. Damaged or collapsed transportation network structures may create areas of isolation throughout Portland. The City EOC will negotiate with the US Coast Guard and private sector maritime assets to facilitate the transportation of emergency responders, equipment and supplies across the Willamette River if bridges are collapsed or impassable. As immediate life safety issues are addressed and stabilized, efforts to facilitate the movement of residents locally and across the Willamette and Columbia Rivers will also be coordinated.

D. While roads may be impassible to automobile traffic, other transportation options including motorcycles, mopeds and bicycles may serve as a viable means of getting around locally. However, if the earthquake triggers a fuel disruption from damaged or ruptured pipelines or loss of energy to power fueling stations – bicycles may become the most practical means of transportation for the public.

E. Communications networks, including public telephone networks, wireless systems, radio and television systems and Internet service may be interrupted, hampering emergency response capabilities.

F. If available, wireless priority service (WPS) and government emergency telecommunications system (GETS) for wireless and wire line telephone communication should be used by essential City employees.

G. The Portland Bureau of Development Services (BDS), Bureau of Environmental Services (BES), Bureau of Transportation (PBOT) and Water Bureau will require additional support from licensed engineers, architects and other qualified inspectors to assess thousands of public and private buildings and infrastructure. The assessments will determine whether structures are safe or in need of repair or demolition. Only those personnel that are registered by the State Building Codes Division may post a building as safe or unsafe to occupy. Registered inspectors will coordinate the review of buildings with local damage assessment teams based on priority ranking. Hospitals and care facilities, police and fire stations, emergency operations centers, water and wastewater facilities and schools are generally at the top of the list.

H. The City will work closely with critical infrastructure owners and operators to facilitate damage assessment, debris removal, emergency protective measures, repair, replacement and restoration of damaged critical facilities and infrastructure.

I. Resources to remove debris will initially be limited as Metro, Multnomah County and the City mobilize assets and available contractors.

J. The earthquake may cause immediate, simultaneous fires from gas and fuel ruptures. Damage to fire suppression systems and water pipelines, difficulty accessing fire incidents and limited resources will hamper response efforts.

K. Numerous aftershocks will follow a large earthquake and may create additional damage or other cascading effects. A large earthquake that occurs when the ground is saturated from rain may trigger landslides throughout steep slope areas of Portland.

L. The City's ability to provide essential services will be impaired.

1. There will be a reduction in emergency service capacity due to injured or unavailable responders or damage to facilities and equipment and emergency services will be overwhelmed. There are not enough public safety resources to immediately address all, or even a majority of, the life safety needs expected.

2. Damage to fire suppression systems, water pipelines and transportation networks will cause difficulty in accessing and controlling fire incidents.

3. The 911 phone system, if operational, will be overloaded.

4. The City's communications and information technology systems may be intermittent or not operational.

5. Facilities and structures may be damaged preventing occupancy and access to essential records and equipment.

M. There will be scores of injured, trapped or deceased casualties throughout the city. This may overwhelm emergency resources and preclude the traditional direct response to each individual emergency or call for assistance. The number of potential fatalities may exceed available resources for handling deaths and remains.

N. A significant loss of housing may lead to a permanent loss of the population and hinder a quick recovery. To the greatest extent possible, the City's goal will be to maintain residents in their home or, short of that – in their neighborhoods.

O. It may be necessary to evacuate the public from immediate, life-threatening situations. People with functional needs may be limited in their ability to take emergency protective actions and will require additional assistance.

1. The demand for emergency shelter may initially exceed availability. Some facilities may require modification to accommodate persons with functional needs. Shelter planning considerations will include care for displaced pets and domestic animals. Each shelter must be inspected for structural damage prior to opening which could delay access to temporary shelter options. The City will not have sufficient housing to accommodate the number of displaced persons and surge of emergency workers managing the response and recovery efforts.

2. Hundreds of residents, as well as tourists and commuters may be stranded in the city due to failure of transportation systems and may require shelter.

3. Families may become separated and require assistance with reunification.

P. City resources will support Multnomah County as the lead agency for health and human service needs.

Q. The City will engage the private sector, non-governmental and community- and faith-based organizations to provide assistance to the impacted community and work with Multnomah County to reach individuals with disabilities and others with access and functional needs including children and the elderly. Assistance may include mass care, sheltering, animal control, damage assessment, disaster welfare inquiry, financial assistance, food distribution, transportation and emergent volunteer staffing and donations management.

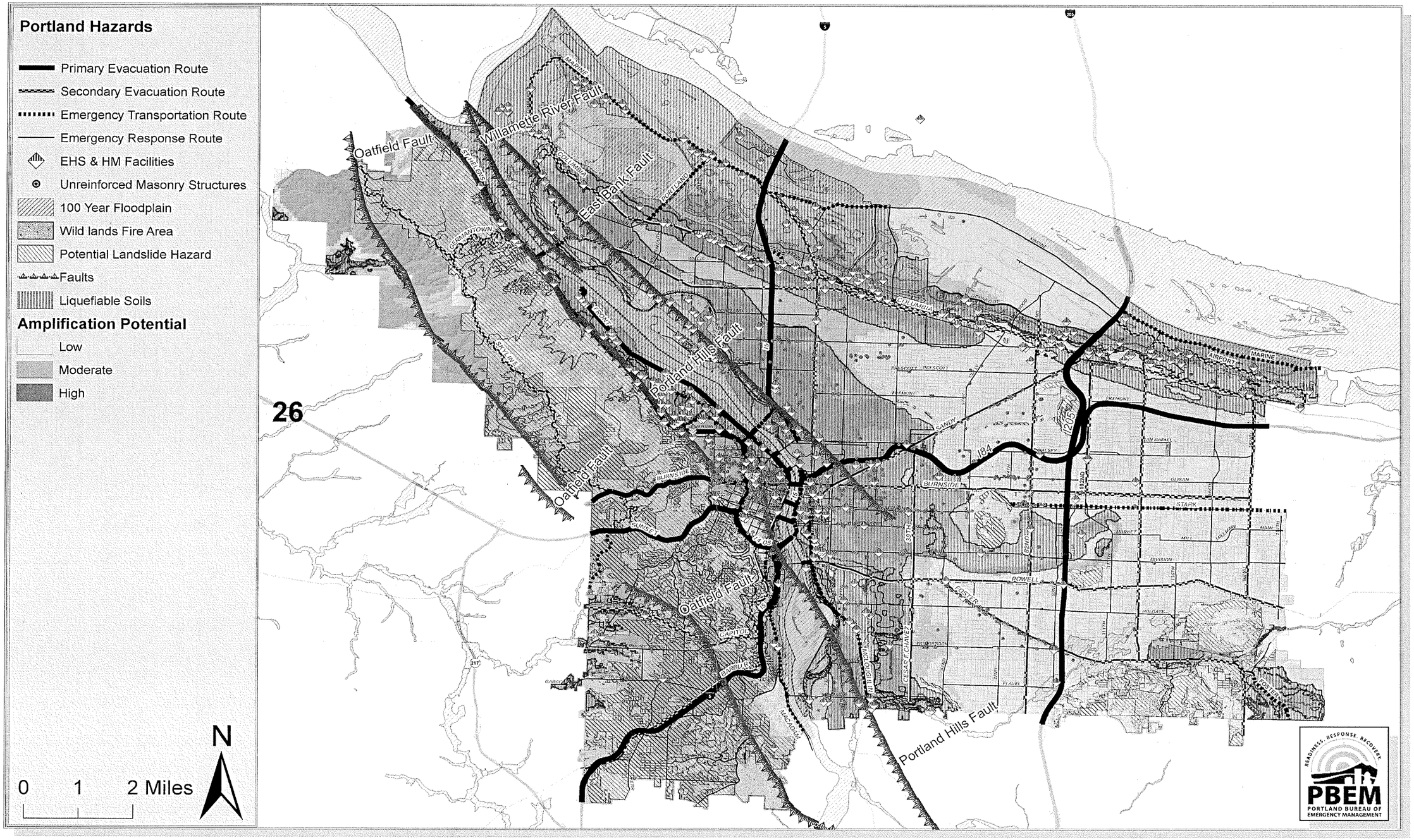
R. Neighborhood Emergency Teams (NETs) will be activated to: assist with rapid visual damage assessment information gathering, conduct door-to-door checks of neighbors, perform medical triage, relay information to/from the City EOC and PF&R stations via amateur radio, perform light search and rescue, shut off

utilities (gas, electricity, water) as appropriate, coordinate emergent volunteers and carry out other duties consistent with their scope of training.

S. WebEOC will be the primary means of crisis information sharing and documentation. In the event WebEOC is not available, paper forms will be used.

T. Figures included in Section 3 – *Roles and Responsibilities* outline local, regional, state and federal resources the City may engage following a large earthquake.

Figure III-1 City of Portland All Hazards



IV. CONCEPT OF OPERATIONS

A. Operational Priorities

Overall City response priorities will focus on:

- Life safety.
- Incident stabilization.
- Environmental protection.
- Property conservation.

B. Immediate Goals and Objectives (first 72 hours)

1. The City will implement immediate emergency response operations in accordance with the BEOP. PPB, PF&R, PBOT and Water will share unified command responsibilities during the immediate response period. Command and coordination will occur in the field with limited assistance from the City EOC until it is fully (or adequately) staffed. EOC priorities will be to gather and synthesize information for an emergency declaration and work through Multnomah County to access non-routine mutual aid assistance including EMAC.

   Immediate City objectives will focus on:

   a) Responding to missions for life safety and rescue, emergency medical service, fire suppression and hazardous materials response and maintaining public order.

   b) Gathering rapid assessment of damages and impacts to the community provided by windshield surveys conducted by: fire and police field personnel, aerial reconnaissance by available fixed wing law enforcement or Civil Air Patrol aircraft, NET members, media coverage, calls to 911 and information provided by the Red Cross and local, regional and state partners.

   c) Clearing debris from ETRs and critical infrastructure.

   d) Ensuring life sustaining essential services and goods are available to the public such as food, water, emergency sanitation facilities and medical care.

   e) Maintaining situational awareness for response and recovery.

2. Bureau incident command posts (BICP) may be activated to assess damage or impacts to infrastructure, facilities and systems and coordinate activities with the City EOC. Mutual aid agreements will be enacted.

3. A situation status report may not be achievable for 24 to 48 hours following a large earthquake. Response operations may have to begin without a complete status report and critical needs assessment. A detailed situation status will provide decision makers including the Mayor, DPC and a Regional Multiagency Coordination (MAC) Group with specific information to inform their decisions.

4. The following is provided as a guideline for a detailed situation status:

   - Preliminary estimates of the number and location of deaths and injuries.
     - Location and status of casualty collection sites.
     - Location and status of medical care points.

   - Location and extent of secondary incidents including fires, landslides and hazardous materials incidents.

   - Location of severely damaged or collapsed structures.

   - Location and estimated numbers of people trapped in collapsed structures.

   - Requirements for a large-scale evacuation and estimated number of displaced persons.
     - Location and occupancy of established shelters.
     - Results of preliminary structural assessment of designated emergency shelters.
     - Estimated number of displaced persons requiring special accommodations.

   - Status of communications systems, including:
     - Public switched telephone network and wireless systems.
     - Public safety radio systems including 800 MHz, VHF, UHF and amateur resources.
     - 911.
     - Internet and satellite services.
     - Amateur Radio.
     - Non-technological based communications systems.

   - Status (open, partial closure or full closure) of roads, bridges, tunnels, under/over passes, primary service streets, ETRs, and bus, light rail and streetcar lines.

- Status of and damage to energy transmission and distribution systems including:
  - Electrical transmission.
  - Natural gas.
  - Petroleum distribution infrastructure.

- Status of critical public buildings and other infrastructure.
  - Police and fire facilities.
  - City water and wastewater infrastructure.
  - City buildings, facilities and offices.
  - Other government buildings and offices.
  - Hospitals and residential care facilities.
  - Schools, colleges and universities (public and private).
  - Port of Portland marine and air facilities and Multnomah County Drainage District (MCDD).
  - Adult and juvenile corrections facilities.

- Status of and damage to businesses and other private sector critical infrastructure.

- Critical resource shortfalls impacting public safety.
  - Emergency response personnel.
  - Additional vehicles, equipment and supplies.

- Mass commodities needs – water, food, medical, shelter and emergency sanitation supplies.

5. Once BICPs and the City EOC are adequately staffed, an emergency declaration will be developed, citywide objectives and priorities established and emergency powers implemented as needed.

6. Through the City's joint information system (JIS), until a joint information center (JIC) can be established, public information officers (PIOs) will coordinate emergency public information regarding recommended personal protective actions, safe congregation points and community assistance.

7. Residents will have to be self sufficient for no less than five days while City resources respond to life threatening emergencies and await additional state and federal assets through emergency declaration processes and EMAC.

C. Short-term Goals and Objectives (72 hours to 10 days)

1. The City EOC will be fully staffed and operational. Short-term goals and objectives will focus on event stabilization. More specifically, EOC sections will:

    a) Monitor ongoing rescue operations and other emergency measures including life safety, fire suppression, hazardous materials containment and maintaining law and order.

    b) Assess citywide continuity of government and status of essential services.

    c) Evaluate citywide water and wastewater conditions and assist in distributing potable water and emergency sanitation solutions until repair and restoration can be accomplished.

    d) Prioritize transportation resources to repair or restore road access for emergency response vehicles.

    e) Restore or prioritize communications operability for emergency response operations.

    f) Utilize the City JIC, and regional JIC (if activated), to provide coordinated emergency information to the public.

    g) Coordinate efforts with critical infrastructure owners to manage resources needed and prioritization of the restoration of energy lifelines (fuel, electricity, natural gas). Coordinate contingency measures to fuel emergency response vehicles and to fuel and maintain generators providing power to critical facilities.

    h) Communicate criteria for residents to assess the habitability of their home and encourage residents to shelter in place whenever practicable.

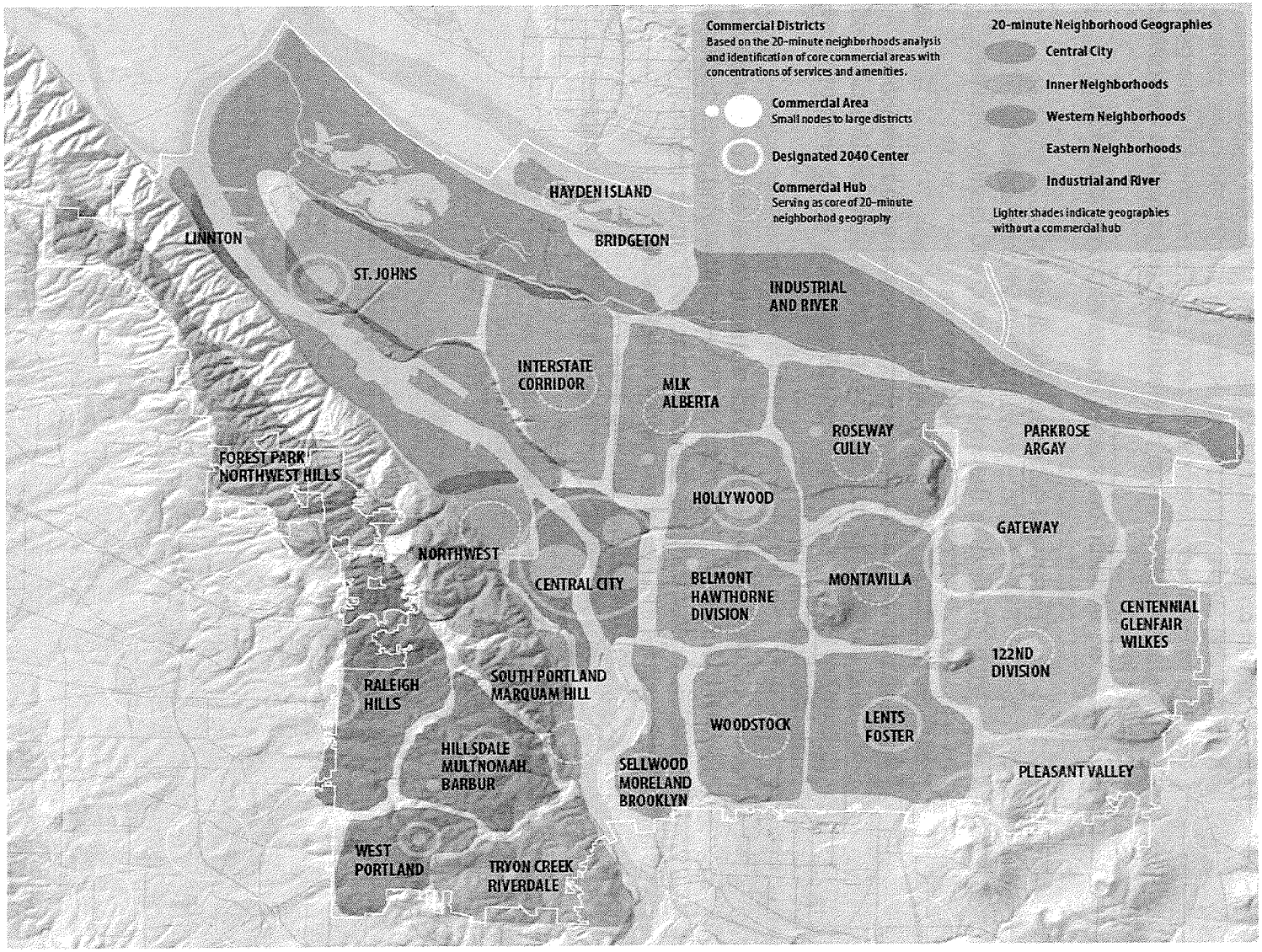
    i) Identify interim housing solutions and begin working with those in need. Work collaboratively with the Red Cross to establish shelters and support their Disaster Welfare Inquiry Program. Identify shelters that can be adapted to accommodate persons with functional and accessibility needs and coordinate efforts with Multnomah County Animal Services to assist with the care and shelter of pets and other domestic animals impacted by the earthquake.

j) Using the Portland Plan's 20-minute neighborhood concept – appropriate sites will be identified in each of the 24 neighborhood hubs shown on the following page. These sites will include designated NET staging areas and other selected neighborhood hubs/centers will be used to establish community points of distribution for emergency food, water and other mass commodities and provide a centralized location for:
    - Information sharing, news and neighborhood communication.
    - Emergent volunteer coordination.
    - Referrals to community based organizations.
    - Access to bathroom, shower, and laundry facilities.
    - Electronics charging stations.
    - Emergency and basic medical care.

    Portland's thriving alternative transportation and food networks, including cargo bikes and food carts, will be recruited to assist with the delivery of food, fuel, water, medical supplies, etc to each of these neighborhood hubs.

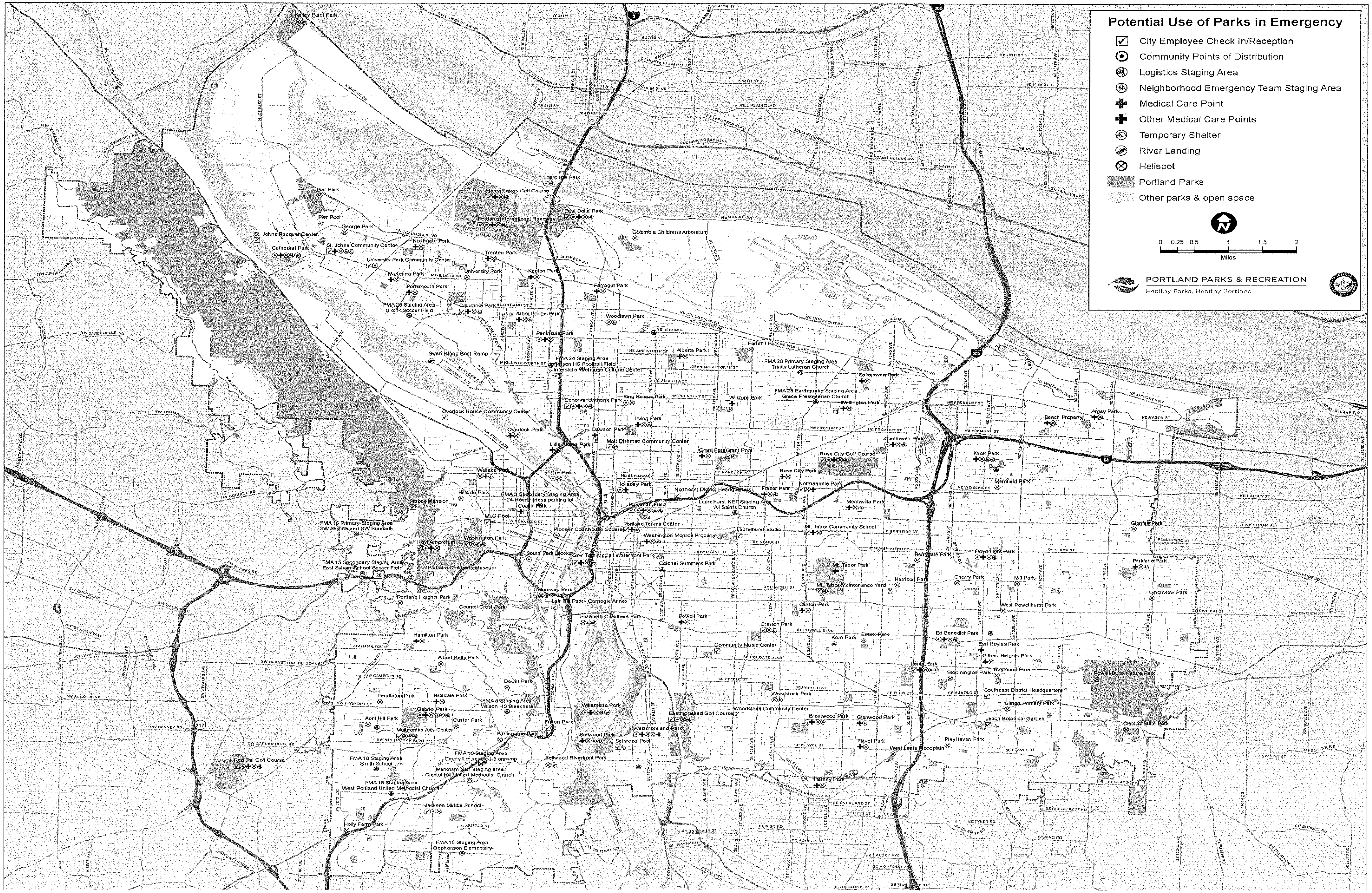
k) Assess City parks facilities to site appropriate emergency uses and response functions. The map on the accompanying page displays the assessed potential uses for each park. After an emergency these parks will be evaluated to identify locations for:
    - Helicopter landing area.
    - City employee check-in location.
    - NET staging area.
    - Resource staging area.
    - Temporary shelter.
    - River Landing.
    - Medical Care Point.

Figure IV-1 Neighborhood Hubs



Map courtesy of the Portland Bureau of Planning and Sustainability - Portland Plan

Figure IV-2 Portland Parks Potential Emergency Uses



l) Conduct outreach for situation status and resource needs for affected facilities needing support including: medical facilities, TriMet, Metro, the Port of Portland, school districts, businesses and industries. As resources arrive from outside the city, they will be integrated into response operations as outlined in the City Consolidated Action Plan (CAP) to ensure a coordinated and unified response.

m) Implement protocols to track emergent volunteers and donations management.

n) Begin developing plans for long-term debris removal.

o) Designate resource staging areas and begin planning to accommodate out-of-area personnel and resources needed to supplement response and recovery efforts.

p) Provide emergency and temporary medical care and establish appropriate public health surveillance protocols. Coordinate with the Multnomah County Medical Examiner to provide fatality management services to include the recovery of the deceased and temporary mortuary solutions, information sharing to concerned relatives and appropriate international consulate offices and counseling to the bereaved.

D. Long-term Goals and Objectives (11 to 30 Days)

1. Establish a Recovery Unit in the City EOC Planning Section to begin assessing long-term recovery needs and objectives. Long-term goals and objectives will focus on the transition from near complete response efforts to sustained emergency operations.

    a) Develop strategies for permanent restoration of essential services and critical infrastructure (water, wastewater, transportation, communications, energy).

    b) Ensure adequate sanitation stations and related amenities are available throughout impacted areas of the city.

    c) Coordinate with the business community to support the resumption of businesses where appropriate.

    d) Facilitate the provision of basic psychological support and emergency crisis counseling services.

    e) Appoint a Continuity of Operations Team.

f) Transition to Long Term Community Recovery (Beyond 30 days)

2. Recovery encompasses restoring physical infrastructure and addressing the financial, emotional and physical hardships of the community as a result of the event. It may take years to repair damage to housing, businesses, schools, infrastructure and the regional economy.

3. Long-term recovery tasks may extend beyond the time that the City EOC is activated. The Recovery Unit will develop a Recovery Plan to ensure that the momentum, organization, and oversight of recovery operations be maintained through an orderly transition to a structure independent of the City EOC.

   The Recovery Plan will:

   a) Identify roles and responsibilities at all levels in the community to leverage partnerships and inclusiveness in recovery planning.

   b) Consider how issues of social equity interconnect with rebuilding transportation, housing, education, economic opportunities, natural areas, community development, and health and public safety networks.

   c) Incorporate strengthened building codes, land use ordinances and zoning designations and measures from the Natural Hazard Mitigation Plan to reduce vulnerability to future disasters.

   d) Identify and secure sources of recovery financing and recommend methods to restore the local tax base.

   e) Implement community and economic revitalization strategies and promote public and private partnerships.

   f) Coordinate local, regional, state and federal efforts to deter and detect waste, fraud and abuse.

   g) Identify a Recovery Leadership Team to implement the plan, act as a forum for public involvement and provide public and private sector coordination.

   h) Promote individual and community sustainable practices that emphasize self sufficiency and resiliency to a variety of disruptions (food, energy, etc): energy efficient homes, community supported agriculture/community gardens/farmers markets/food buying clubs, rainwater catchment, and alternative transportation options to name a few.

V. ROLES & RESPONSIBILITIES

City bureaus are responsible for the development of response plans that guide internal operations, including continuity of operations plans (COOP) and other policies to address emergency situations.

A. General

1. The roles and responsibilities of all City bureaus are identified in the BEOP. All bureaus should be prepared to reassign personnel and resources to support citywide efforts to respond to and recover from a large earthquake. City bureaus are tasked with managing their respective infrastructure and providing personnel and resources to support the City's coordinated response.

2. Suspension of routine day-to-day operations or altered levels or availability of service may be necessary to ensure overall continuity of essential City services.

3. A large earthquake will result in regional demand for the resources the City relies on to provide for the health and welfare of the population and the economy. Regional multi-agency coordination will be necessary to ensure that the needs of response partners are met.

   The following critical response and recovery functions are provided as a guideline and not intended as an exhaustive list of responsibilities.

B. Coordination, Direction and Control

1. Immediately following a large earthquake the City ECC will be activated as an EOC to establish and maintain a unified incident command structure that coordinates critical stakeholders and supports emergency response operations.

2. The City EOC is responsible for: completing the disaster declaration process, establishing a citywide strategy guiding response and recovery, tracking resource management and scare resource allocation, disseminating emergency public information, identifying and obtaining state and federal assistance and coordinating with regional, state and federal partners.

C. Communications

1. An assessment will be conducted to check the status of communications systems and ensure critical communications are operational and available, including:

    a) Computer Aided Dispatch / 9-1-1.

    b) Public switched telephone network, wireless and internet protocol based systems.

    c) Public safety radio systems, towers and repeater sites.

    d) Amateur radio networks.

    e) Internet and satellite services.

    f) WebEOC.

2. The EOC Logistics Section – Communications Unit will work with the Bureau of Technology Services and telecommunications providers to expedite the restoration of Internet connectivity, Public Switched Telephone Network as well as the City's internal telephone switch, wireless data network, cellular telephone service, paging system, Computer Aided Dispatch and public safety radio systems.

    a) The Communications Unit Leader (COML) will manage the technical and operational aspects of the communications function during EOC activation and supervise the Communications Unit. The COML will coordinate and deconflict the use of communication systems and channels for field response and each of the incident command posts (ICP) or area commands.

    b) Multnomah County Amateur Radio Emergency Services (ARES) will be called to provide amateur radio backup communications from the City EOC. ARES volunteers will report to the COML who works under the direction of the Logistics Section Chief. All information gathered and communicated will be logged into the Logistics Section Log.

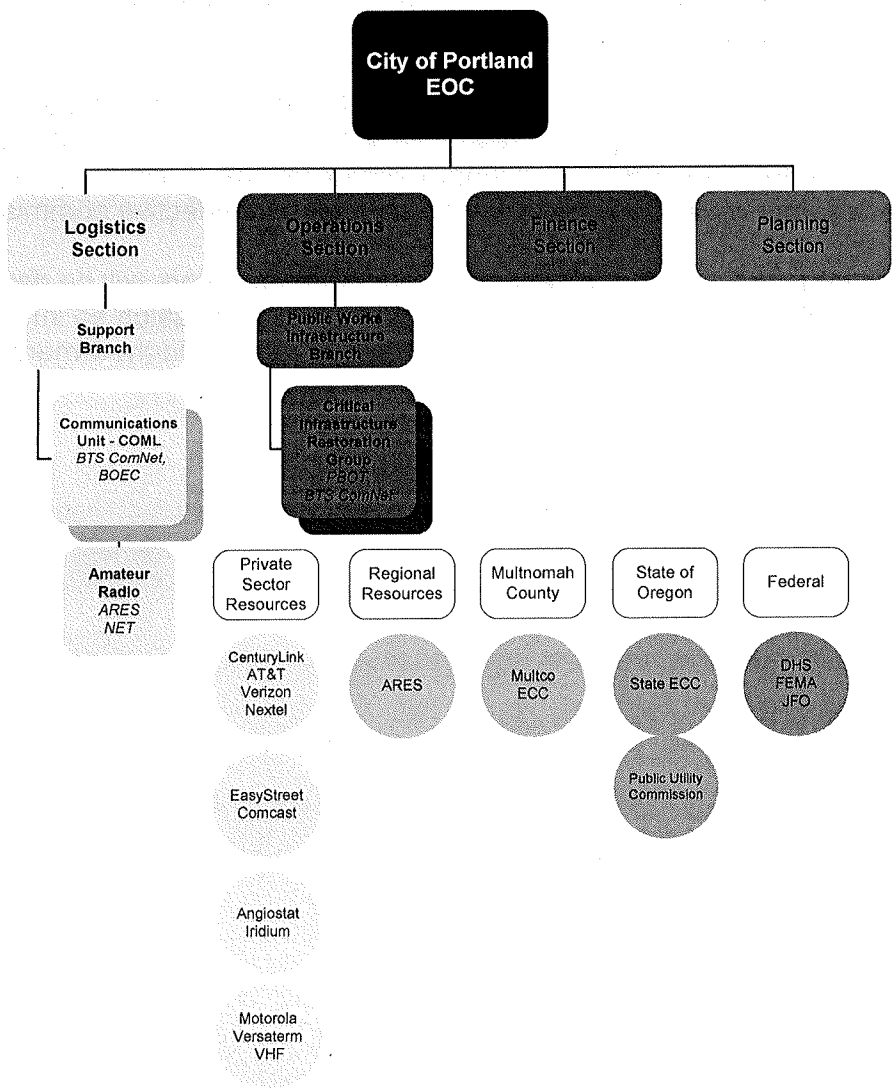
        i. ARES volunteers will also respond to Portland fire stations where amateur radio kits have been prepositioned to provide a conduit for community situation status reporting by NETs, local residents and emergency responders.

ii. If necessary, and if adequate numbers of ARES members are available, amateur radio operators may be assigned to 911 and the back up 911 trailer, PPB precincts, bureau incident command posts, mobile communications units and public works maintenance yards.

3. Liaison officers will coordinate the flow of information between the City EOC and other partners engaged in response activities (i.e., county, state, regional/federal government, voluntary organizations, businesses, and other private sector organizations) to maintain timely and effective communication.

4. Neighborhood Emergency Team amateur radio operators will be deployed in support of the neighborhood response and recovery mission so information about damage and community impacts can be relayed to the Emergency Operations Center.

Figure V-1 Communications



The agencies identified above are representative of a larger list of participants involved in disaster management in Portland's Emergency Operations Center as well as other multi-agency coordinating facilities.

D. Alert and Warning

1. Unified command may request the use of the emergency alert system (EAS), FirstCall community notification system, door-to-door messaging, or other means of notification to provide the public with immediate emergency information of new or developing situations.

2. Social media (Twitter, PublicAlerts, Facebook) and broadcast media will also play an important role to alert and warn the public and provide a platform for disseminating regular and ongoing updates of the emergency event to the public.

E. Emergency Public Information

1. City PIOs will coordinate prompt and reliable information through the use of broadcast and social media. Working with the Office of Neighborhood Involvement (ONI) and Multnomah County's network of neighborhood associations and community connectors, efforts will be made to reach culturally diverse and vulnerable groups including non-English speakers and those unable to take emergency protective action due to functional needs.

2. The regional joint information system (R-JIS) will be activated and a regional joint information center (R-JIC) will likely be stood up. The R-JIC will include nongovernmental and private sector partners to ensure information is coordinated and accurate.

3. PIOs will utilize the *Portland Urban Area Regional Emergency Public Information Concept of Operations Plan* to establish outreach communications protocols and provide information to the public and the media regarding:

    a) Life or health protective action recommendations.

    b) Situation and status of emergency operations.

    c) Information in response to public or media inquires.

    d) Information to resolve conflicting information or dispel rumors.

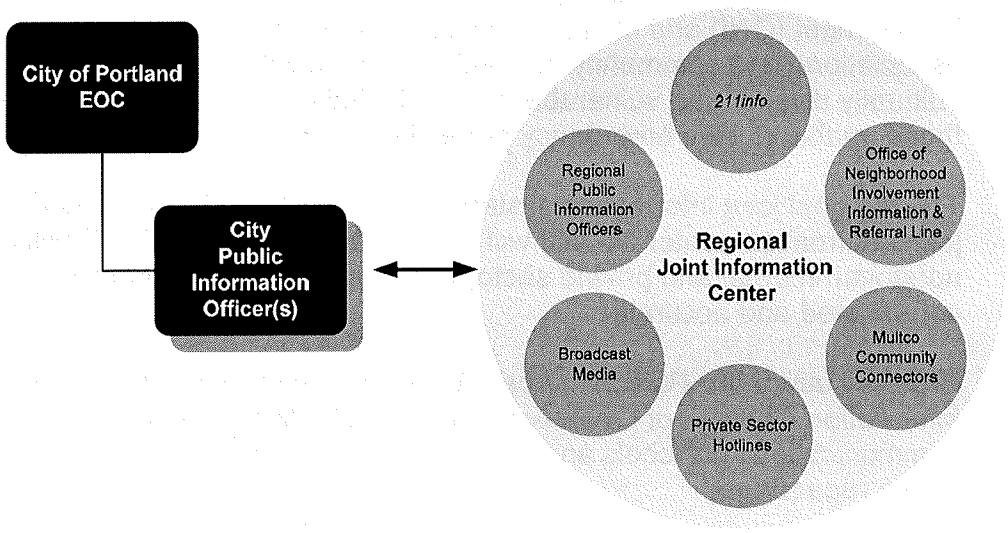
    e) Information regarding sheltering options including their locations and food, water, sanitation and medical resources.

4. Regular media briefings will be scheduled to inform the public of response operations, services available to them, ongoing rumor control efforts and ways in which the community can help.

5. 211*info* and the City/County Information & Referral line will help disseminate emergency public information. 211*info* will serve as the countywide, if not regional, public inquiry center (PIC) as they regularly connect the public with community and social resources and will be able to disseminate critical information. The Information & Referral line will serve as the central resource for information about city and county programs, services and employees.

6. In close coordination with the R-JIC, City PIOs will monitor the media, including social media, for relevant trending topics and hash tags i.e., #pdxeq (Portland earthquake). PIOs will share crowd sourced information with the Planning Section Situation Unit to determine if information can help inform situation status.

Figure V-2 Emergency Public Information



F. Energy

1. Energy providers including Portland General Electric, Pacific Power, NW Natural and petroleum fuel providers will implement their respective response measures to outages and reports of damaged infrastructure and initiate rapid repair and restoration of infrastructure-related energy services.

2. The EOC Operations Section – Public Works Infrastructure Group, in coordination with Multnomah County and the State Office of Emergency Management, will liaise with private energy providers and critical infrastructure owners and operators to determine the extent of damages. As resources allow, City bureaus may assist the private sector to stabilize and repair essential critical energy infrastructure.

3. State and federal resources will work with City and private energy providers to assess the extent and duration of energy disruptions. Other priorities include:

    a) Identifying resources to facilitate the restoration of energy systems.

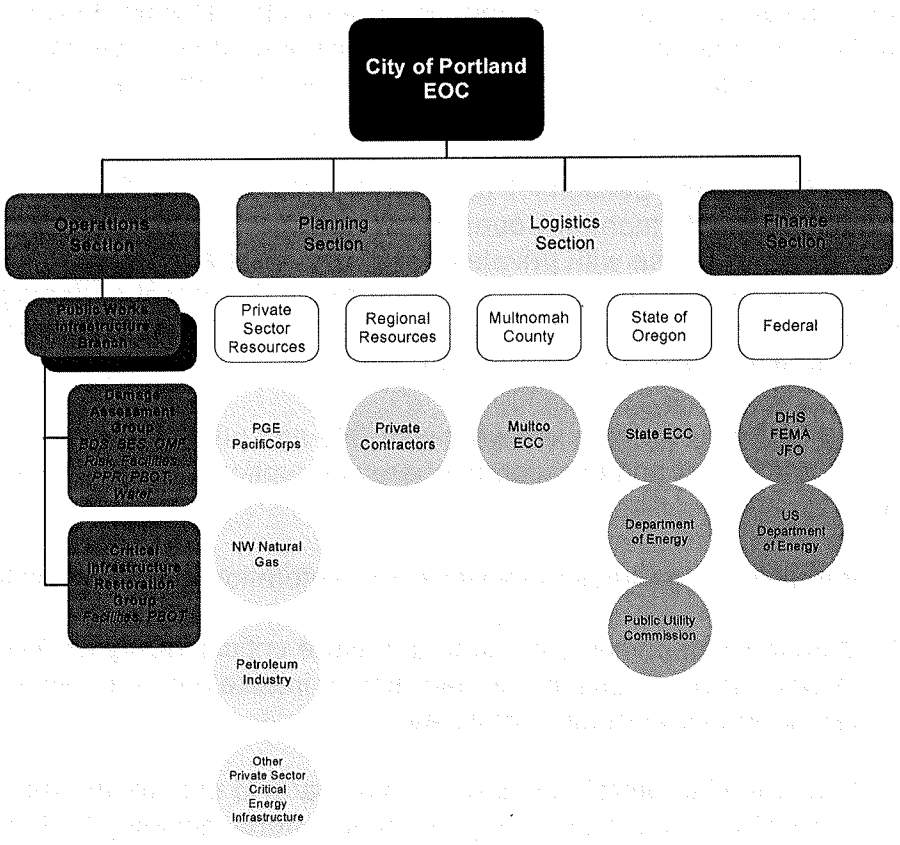
    b) Working with unified command to ensure critical facility workers and owners have access to their facilities to initiate damage assessment, repair and infrastructure restoration.

    c) Implementing petroleum contingency plans to ensure an adequate fuel supply to sustain emergency response efforts including fuel for fire, police EMS and debris removal vehicles as well as provide fuel supply to generators at critical facilities. Energy resource needs will be communicated to Multnomah County for consideration under the Oregon Petroleum Contingency Plan.

    d) Prioritizing repair and restoration and continuously monitoring the status of energy system damage, repair and restoration work.

    e) Recommending energy and fuel conservation guidance.

Figure V-3 Energy



G. Population Protection

1. Portland Police Bureau and Portland Fire & Rescue field personnel will identify areas and locations that may need to be evacuated, including damaged school campuses, multi-family housing units, hospitals, medical care facilities, convention and recreation centers and neighborhoods extensively impacted by earthquake damage or other hazardous conditions.

2. To the greatest extent possible, residents will be encouraged to remain in their homes and shelter-in-place. However, if there is a need to evacuate residents, an Evacuation Branch will be established in the City EOC Operations Section. Assistance from other bureaus and mutual aid organizations will be necessary to ensure the safe movement of residents away from immediate threats.

3. Safely evacuating persons with access and functional needs will require specific considerations including:

    a) Identifying, coordinating and mobilizing transportation and equipment resources. Ensuring that transportation options allow the transport of mobility devices, durable medical goods or service animals.

    b) Providing interpreters to those with language and communication access needs.

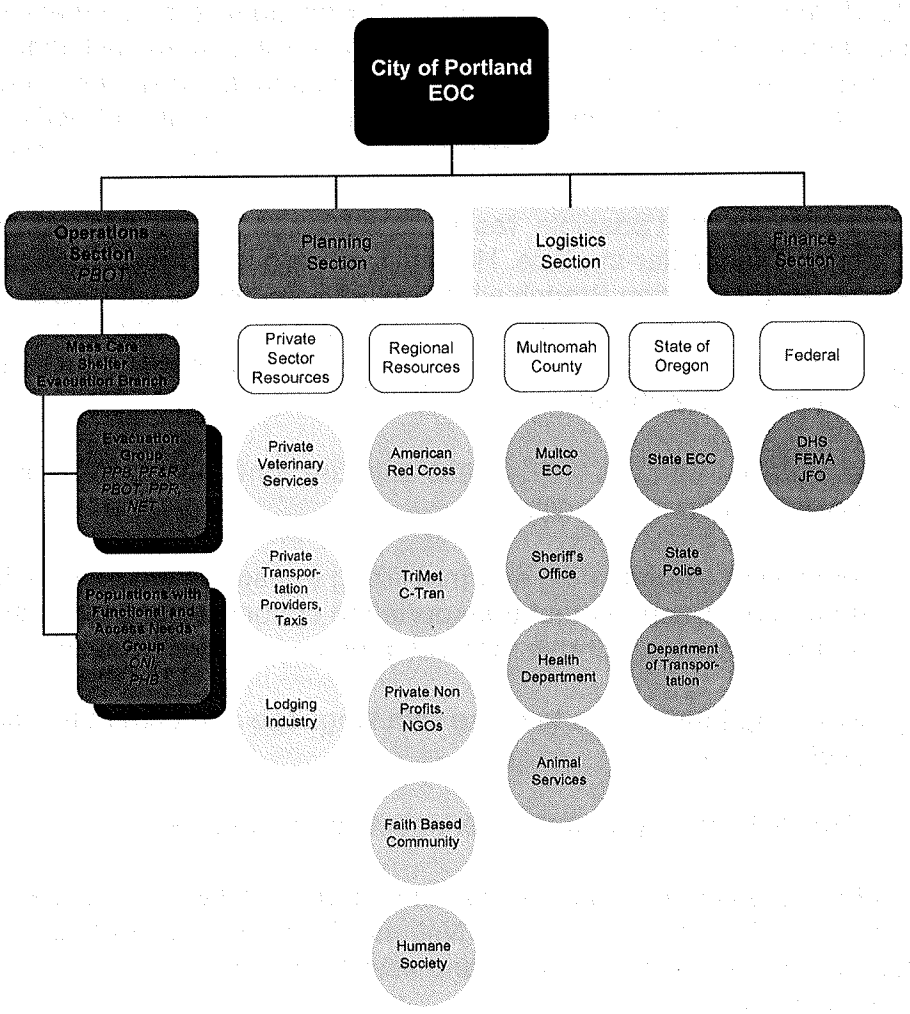
    c) Establishing a system to track people and equipment.

4. Restricted access and security to evacuated areas may be necessary. A request to the Governor for Oregon National Guard resources to supplement limited law enforcement resources and assist with security needs may be submitted by the EOC.

5. Portland Parks & Recreation may be requested to identify parks facilities for use as evacuation reception centers while emergency shelters are being assessed, staffed and opened.

6. Neighborhood Emergency Teams may be tasked with going door-to-door to notify neighbors of evacuation notices or other protective action recommendations.

Figure V-4 Population Protection



H. Mass Care/Emergency Assistance

1. Once potential shelter sites have been assessed for structural damage prior to occupancy, the City EOC will coordinate with the American Red Cross Oregon Trail Chapter to open temporary shelters and provide services to those displaced by the earthquake. Site assessments will be conducted to identify:

    a) Critical support requirements including shelter management personnel, site security and adequacy of feeding and medical care arrangements.

    b) Optimal shelter demographics (gender, children, medical needs, language barriers, functional needs) and plans for caring for and sheltering pets and other domestic animals impacted by the earthquake.

    c) Family reunification needs.

    d) Mass care needs in light of ongoing aftershocks and subsequent damages.

2. The EOC will coordinate efforts with Multnomah County and the American Red Cross to provide just-in-time training to available volunteers to help staff temporary shelters.

3. The EOC Operations Section – Mass Care, Shelter and Evacuation Group will coordinate with the Multnomah County ECC to establish plans for how to provide care for people with functional needs or support requirements that cannot be met in general population shelters. As resources permit, shelters will be adapted to accommodate populations with specific access or functional needs (individuals with disabilities, the medically fragile, elderly as well as the groups and organizations that support these individuals).

4. The Portland Housing Bureau and their partner agencies may be requested to assist with planning for the mass care and housing of displaced populations. The EOC will reach out to the lodging industry and local and national retailers as well as other private sector partners to implement short-term housing solutions as well as pursue creative options like exploring the use of shipping containers, plentiful at the port terminal, for use as temporary emergency relief shelters/homes.

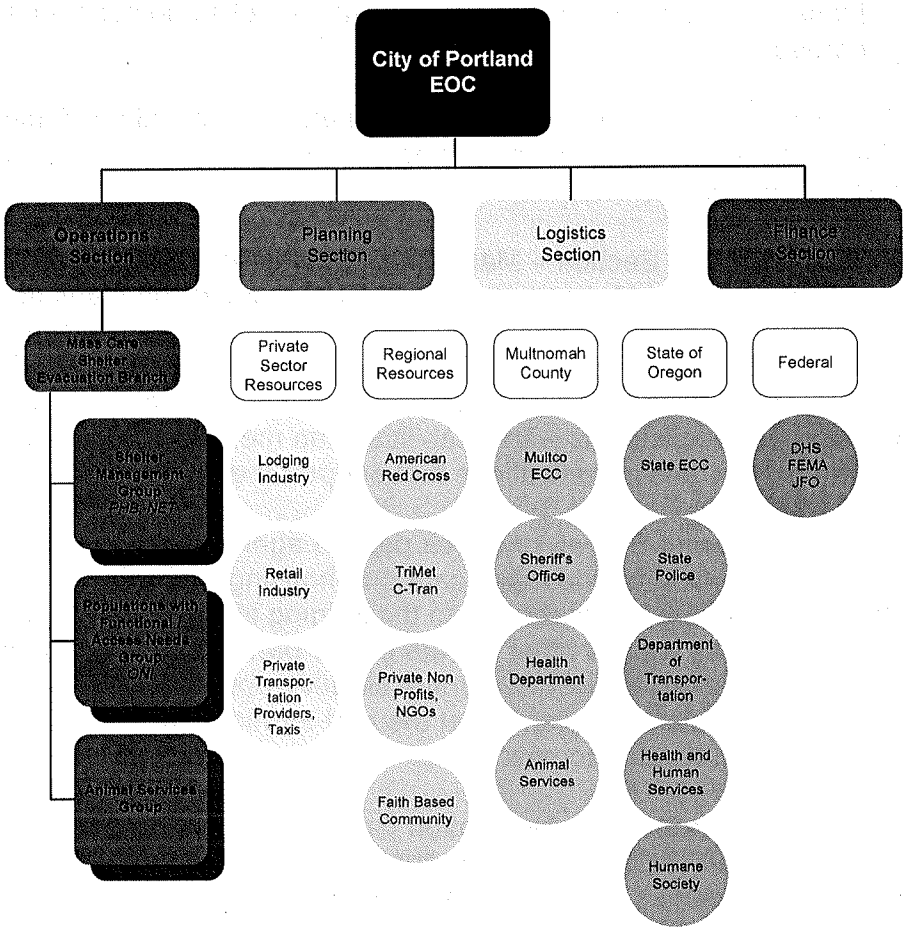
5. The Mass Care, Shelter and Evacuation Group will coordinate a community point of distribution (POD) system for drinking water, food and other necessary commodities for persons not residing in mass care facilities but who are without basic services and activities. These community PODs could

be sited at Neighborhood Emergency Team staging areas, designated parks, schools, parking lots or other appropriate facilities strategically located throughout the City based on ease of access and proximity to other services.

6. At a regional level, the Mass Care, Shelter and Evacuation Group will work to disseminate the emergency water distribution system (EWDS). The EWDS is designed to be hooked up to a fire hydrant, water truck, water bag or other source of potable water to quickly deliver six-quart bags of water to the public in an emergency. There are eight EWDS located around the Portland metropolitan region.

7. The Mass Care, Shelter and Evacuation Group will also work with vendors to deploy temporary sanitation facilities and portable toilets to multifamily dwellings and large assembly sites and encourage the use of ecological sanitation options including composting or waterless toilets until additional resources are available or sewer restoration is feasible.

Figure V-5 Mass Care and Emergency Assistance



I. Health and Medical

1. Fire and emergency medical service responders will rescue, triage, treat and transport the injured to available healthcare facilities.

2. PF&R will establish medical care points at designated parks or other suitable areas. Health care facilities may implement their own medical surge capacity plans to ease crowding at hospital emergency rooms.

3. Bureau of Development Services Damage Assessment Teams will coordinate with facilities personnel from local hospitals and Multnomah County to conduct rapid initial assessments of critical health care facilities and report significant structural damage to facilities. Multnomah County Health Department will determine:

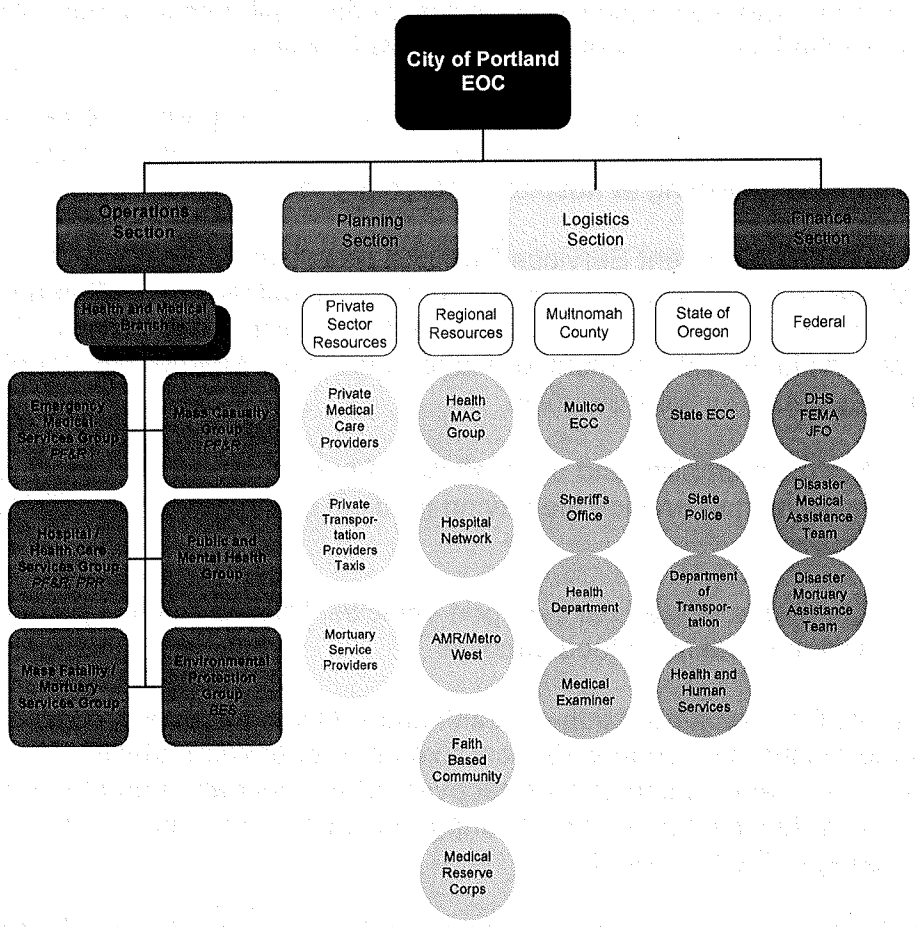
    a) Status, capability and accessibility of public and private health care facilities that provide life saving medical treatment to the critically injured.

    b) Shortages of medical transport vehicles, trained medical personnel and medical and blood supplies.

4. The EOC Operations Section – Health and Medical Group will coordinate with the Multnomah County Medical Examiner to provide fatality management services to include recovery of the deceased and temporary mortuary solutions, information sharing to concerned relatives and counseling to the bereaved.

5. The Health and Medical Group – Public and Mental Health Branch will support Multnomah County's efforts to implement surveillance measures designed to prevent the spread of disease or environmental contamination and liaise with Multnomah County Health Department and the Health MAC Group to restore health and social services networks to promote the resilience, health, independence and well being of the whole community.

Figure V-6 Health and Medical



J. Resource Management

1. The City has mutual aid agreements with numerous agencies and organizations within the Portland metropolitan area including most first responder agencies in Clackamas, Columbia, Multnomah and Washington Counties in Oregon and Clark County in Washington, as well as other local, state and federal partners. City bureaus work with these partner agencies on a frequent basis, building strong working relationships that easily transcend from routine operations to emergency response.

2. Each bureau is tasked with resource management during the immediate response to a large earthquake. Once activated, the EOC Logistics Section will manage all resource ordering for the entire response, superseding subordinate logistics operations.

3. The EOC Logistics Section – Support and Service Branches will identify critical resource shortfalls and request support through mutual aid or through Multnomah County for state and federal assistance through an emergency declaration for additional:

    a) Law enforcement resources and personnel.

    b) Medical resources, trained personnel and supplies including Disaster Medical Assistance Teams (DMAT).

    c) Urban Search and Rescue (USAR) teams.

    d) Fire suppression and hazmat support.

    e) Building inspectors.

    f) Interpreters and translators.

    g) Disaster Mortuary Operational Response Teams (DMORT) for assistance with fatality management.

    h) Infrastructure repair resources through Emergency Management Assistance Compact (EMAC), Oregon Regional Water/Wastewater Agency Response Network (ORWARN), Portland Metropolitan Area Transportation (PMAT) Co-Operative Intergovernmental Agreement or other state and federal resources.

4. Other resource management priorities include:

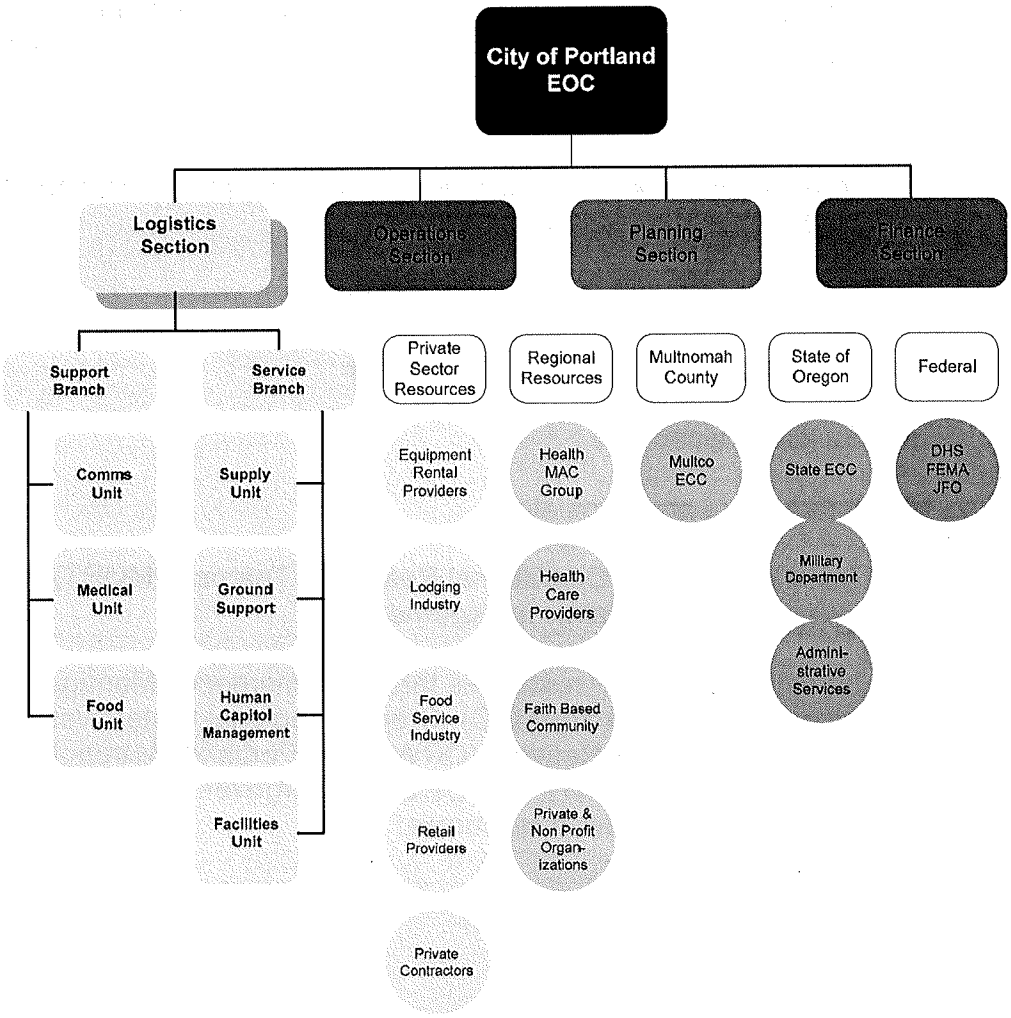
   a) Establishing emergency power and fuel lines and ensure that an adequate, stable system is in place to fuel emergency vehicles and maintain generators providing power to critical facilities until a more permanent supply line is established.

   b) Locating and operating relief supply and food commodity distribution points.

   c) Working with the Regional Water Providers Consortium to establish a potable water distribution system.

   d) Establishing a system for volunteer and donations management.

Figure V-7 Resource Management



K. Public Works and Transportation

1. Damage Assessment Teams from Water, PBOT, BES and BDS will be deployed to perform a visual assessment of critical infrastructure systems and facilities. Each bureau has identified and prioritized critical infrastructure to be assessed.

   PBOT and regional road authorities will implement traffic control plans.

   a) The EOC Planning Section will coordinate debris removal and clearing of emergency transportation routes to provide for access and transportation service priority objectives including evacuation of people and delivery of vital response personnel, equipment and services into Portland. Locations for debris storage, transfer stations and processing will be established.

   b) The City Traffic Engineer will prioritize and designate specific routes or lanes into the city for critical relief supplies.

   c) PBOT will implement their Post-Earthquake Bridge Inspection Response Plan which provides for a systematic, efficient and prioritized inspection of all bridges after an earthquake. It is important to note that damaged Portland area bridges, overpasses and tunnels will be closed to the public following a moderate or large earthquake until initial damage assessments can be completed. Damage assessments and inspections of all bridges will be conducted.

2. The EOC Logistics Section will negotiate with the U.S. Coast Guard (USCG), PF&R, Multnomah County Sheriff's Office, barge/tow companies, Portland Spirit and other private sector river/maritime assets to assess means of ferrying emergency responders, vehicles, equipment, supplies and the public across the river if bridges are collapsed / closed. Private boats and other water craft may also be used to ferry the public across the river. If necessary, a resource request will be made for the deployment of available Oregon National Guard floating bridges.

3. The Critical Infrastructure Restoration Branch, in conjunction with the USCG, will determine the feasibility of using river traffic as a means of transporting critical and scarce resources. Alternatively, aerial support may be needed to support operational and logistical needs due to extensive transportation network damage.

4. The Planning Section Recovery Unit will work with BDS to implement an expedited permitting system to facilitate needed repairs and/or demolition of damaged structures.

5. The EOC Operations Planning Section will conduct outreach to the following agencies for situation status and resource needs for affected facilities needing support:

   a) Multnomah County Drainage District and United States Army Corps of Engineers (USACE) to determine status and integrity of the levee system.

   b) Port of Portland and the USCG to determine the status and assessment of damages to marine terminals and Portland International Airport.

   c) BNSF and Union Pacific railroads to determine status of, and damages to, rail infrastructure.

   d) Education providers to determine status of and damages to all facilities for the school districts within the city.

   e) Energy and utility providers to assess damage to infrastructure and obtain outage information including estimated number of people and area affected and initial restoration projections.

   f) Industry sector, Portland Business Alliance, and other business and community organizations to gauge community and economic disruptions and damages to facilities.

Figure V-8 Public Works

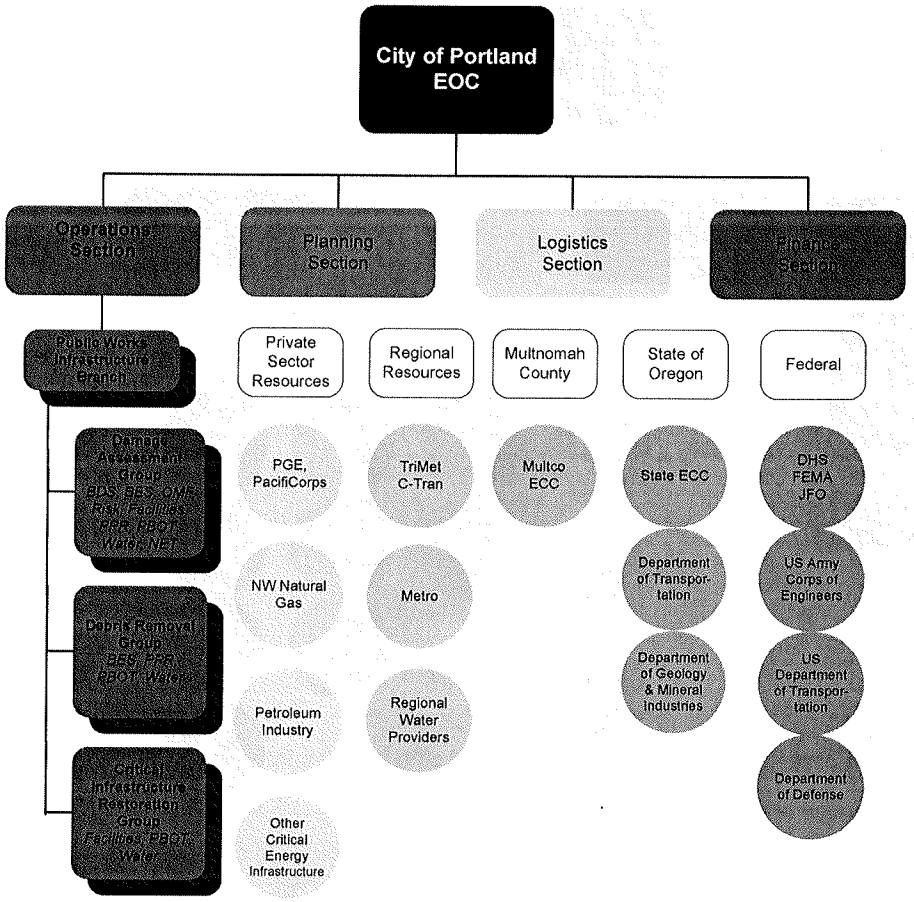
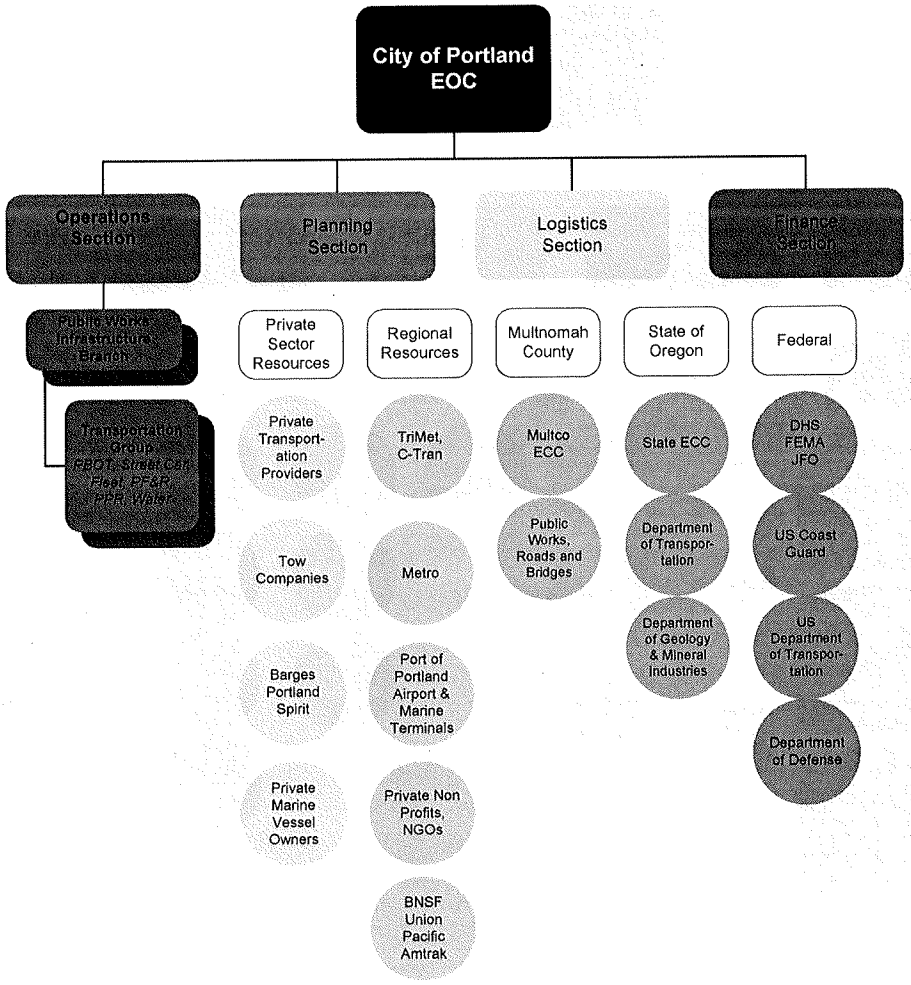


Figure V-9 Transportation



L. Firefighting

1. Portland Fire & Rescue operates 30 engine companies, nine truck companies, two fireboats, two rescue boats, two heavy rescues, and three squad units, including two specialized units for Chemical, Biological, Radiological, Nuclear and Explosive Device (CBRNE) response and a specialized unit for hazardous materials. Emergency response is provided from 30 fire stations strategically located throughout the city. PF&R maintains specialty teams that have additional capabilities including: water rescue, dive rescue, trench rescue, confined space rescue, high angle rope rescue, HazMat team and a Marine Unit. In November 1998, Portland residents authorized the sale of general obligation bonds to seismically upgrade fire and rescue stations and relocate and build new stations to meet the goal of a four-minute response time to emergency incidents. To date, all but two fire stations (Station 18 and Station 21) have been seismically retrofitted.

2. Firefighters will respond to the immediate known effects of the earthquake including life saving search and rescue operations, fire suppression, uncontrolled fires caused by gas leaks and containment of hazardous spills in their immediate fire management areas. Operational priorities include:

    a) Accounting for members. Conducting a roll call for field personnel and recalling off duty personnel per PF&R General Order #3.

    b) Evacuating all personnel if the fire station sustains heavy damage. If possible, moving all response vehicles away from damaged buildings.

    c) Conducting fire suppression and ensuring that hazardous material spills and other environmental hazards are contained.

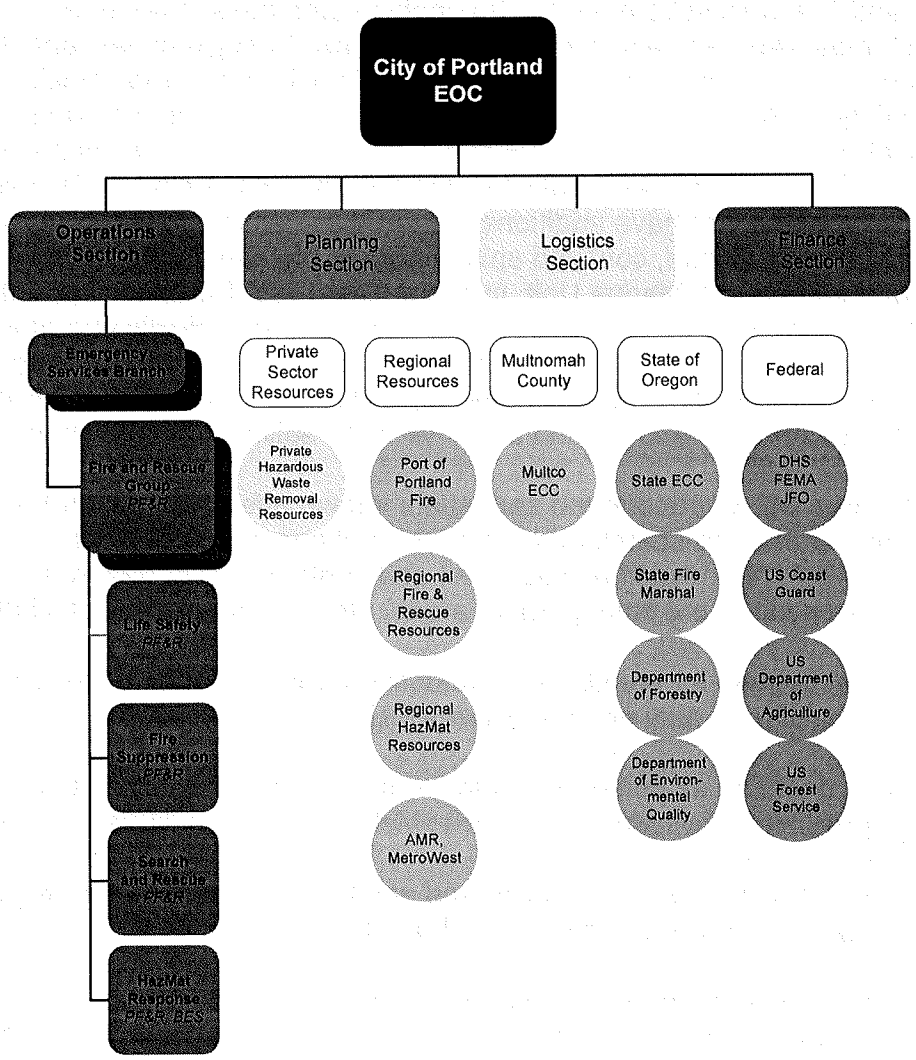
    d) Conducting urban search and rescue in affected areas for victims and locating, accessing, medically stabilizing and extricating victims from damaged areas.

    e) Evacuating persons in danger, rescuing trapped victims, assisting with evacuations or shelter-in-place and defining immediate routes and destinations for evacuees.

    f) Determining and implementing initial protective actions for emergency responders and the public in the surrounding area.

    g) Providing personnel at fire stations to assist Neighborhood Emergency Teams and/or amateur radio operators' ability to communicate with the City EOC.

Figure V-10 Firefighting



M. Public Safety and Security

1. Portland Police Bureau operations personnel are staffed around three precincts, a traffic division and transit police. PPB maintains specialty teams that have additional capabilities including, but not limited to: Explosives Disposal Unit (EDU), Special Emergency Reaction Team (SERT), Rapid Response Team (RRT), Mounted Patrol and an Air Support Unit.

2. PPB precinct commanders will take charge of precinct emergency operations. Field personnel will be directed not to become involved in rescue operations unless such incidents are immediately life threatening and rescue can be accomplished rapidly.

3. The most urgent police responsibilities immediately after an earthquake are to:

    a) Account for members and conduct a roll call for field personnel. On-duty personnel will be required to remain on their shift assignments until properly relieved.

    b) Evacuate all personnel if the building in which they are located sustains heavy damage. If possible move vehicles out of and away from buildings.

    c) Provide the City EOC with damage assessment information of key facilities, as well as a general damage and injury assessment of the area, including precinct or office location assessment.

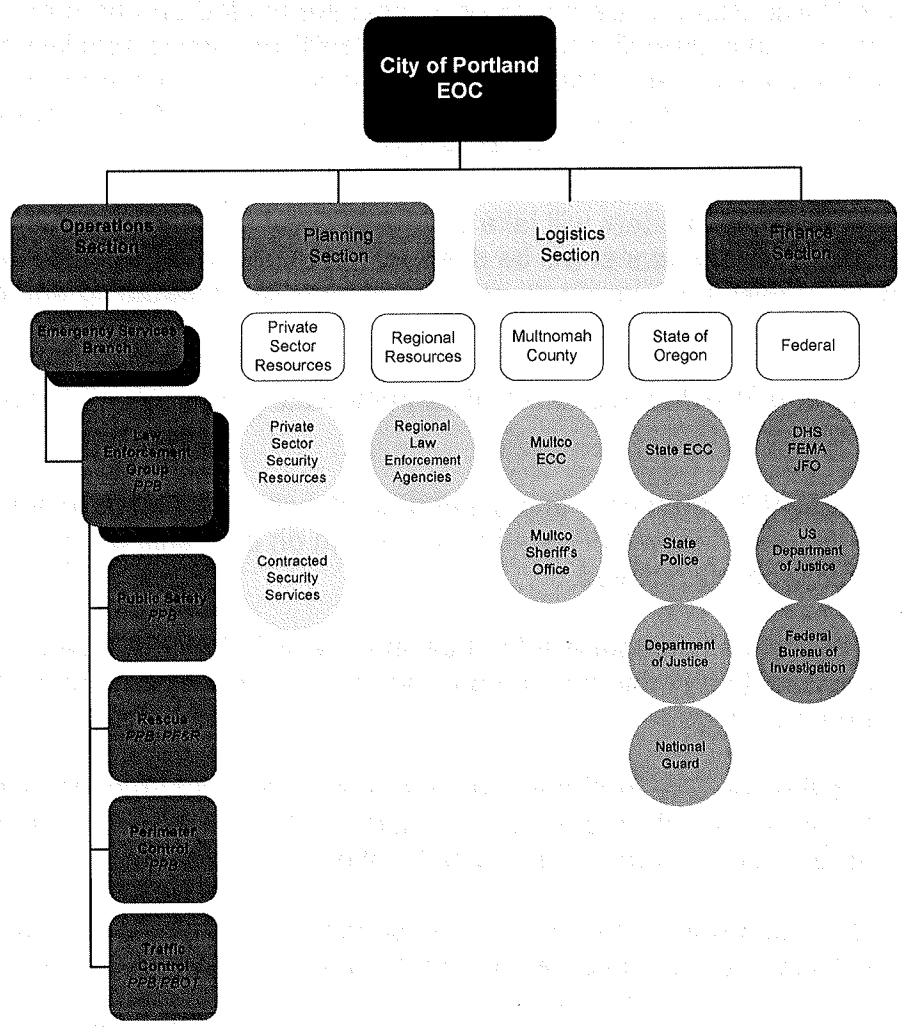
    d) Open and maintain primary ingress/egress routes for emergency vehicles. As resources allow, assist with traffic control of ETRs.

    e) Provide a visible uniformed police presence throughout the city to maintain order and prevent looting. Provide access control and site security for damaged areas and critical facilities.

    f) Facilitate evacuation of displaced persons to prearranged shelters designated by the City EOC at the request of the incident commander.

    g) Assist in the organization of civilian volunteers. Direct volunteers to volunteer check-in locations designated by the City EOC.

Figure V-11 Public Safety and Security



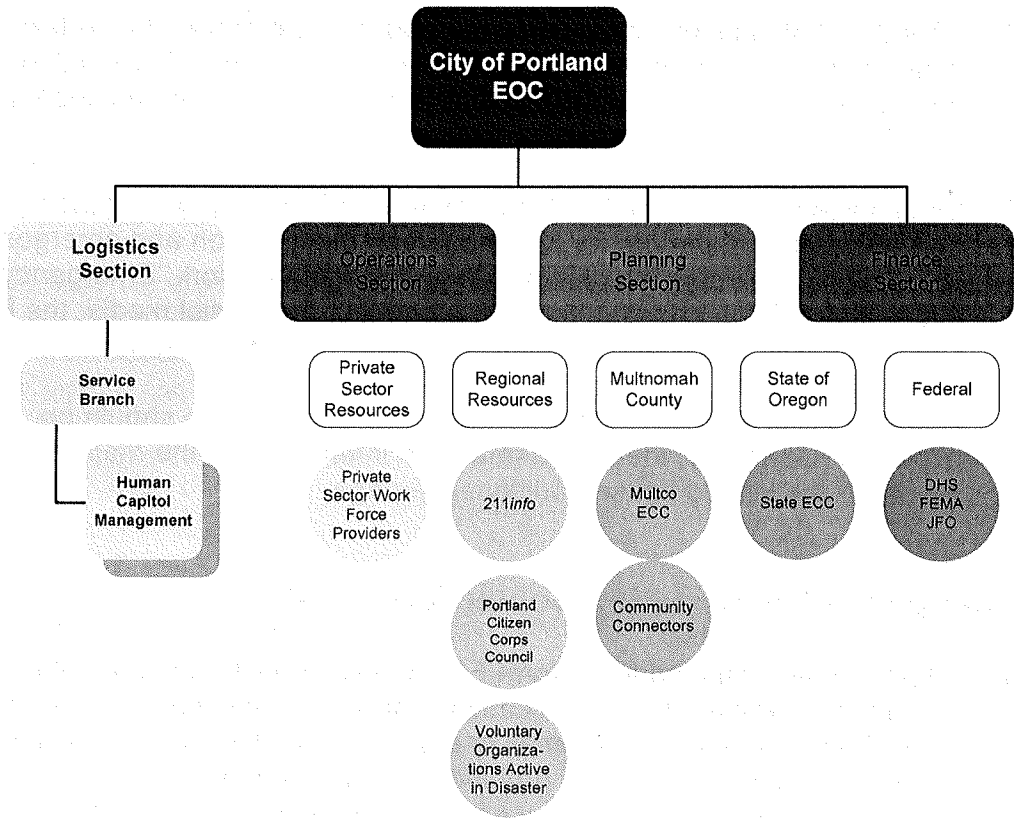
N. Volunteer and Donations Management

1. Coordinate efforts with Multnomah County to utilize Community Organizations Active in Disaster (COAD), Portland Citizen Corps Council and 211*info* to:

   a) Implement a system to manage the influx of offers of goods and services, coordinate offers of unaffiliated volunteers and tracking system to document donation needs, volunteer information and the ability to match needs with available offers of assistance.

   b) Establish a structure responsible for receiving, tasking and delivering needed goods and services to affected individuals, families and communities.

Figure V-12 Volunteer and Donations Management



O. General Guidance for all City Employees and the Public

1. If you are indoors when an earthquake strikes – *drop and take cover under a sturdy table or other furniture. Hold on to it and stay put until the shaking stops.* If there is no nearby table or desk, sit on the floor against an inside wall, away from windows, tall furniture, bookcases or other heavy furniture that can fall and injure you. Protect your head and neck with your arms. Stay inside – breaking glass and falling objects (bricks, cornices, ornamental facades) may injure you if you run outside.

2. If you are outside, move to a clear, open area if safe to do so – avoid power lines, trees, signs, buildings, vehicles and other hazards.

3. On-duty City personnel not assigned to emergency duties shall report to their normal pre-designated bureau reporting location as specified in their bureau emergency plan and/or continuity of operations plan. Supervisors from all bureaus should conduct roll call and determine employee and bureau status as soon as practicable.

4. After the shaking stops off-duty employees and the public should take care of their family's emergency needs, ensure the safety and welfare of their family and home and prepare to report for emergency assignment as soon as possible.

5. Employees should check local television or radio, or www.portlandonline.com and www.publicalerts.org for information on the situation and emergency instructions, including instructions about returning to work. Emergency public information will be provided through broadcast and social media, the First Call community notification system and other available means.

6. After the initial earthquake shock, additional after-shocks should be expected. Generally, these are smaller in intensity than the main quake; however, they could cause additional damage.

P. Emergency Coordination Center Responders

1. All personnel assigned to perform ECC duties should respond to the ECC immediately regardless of notification. Notification may come in the form of a page/SMS text, phone call, email or other method. Disruption or failure of communication systems may prohibit timely notification, therefore ECC responders should assume they are needed and respond to the ECC after stabilizing their families and notifying their immediate supervisor of their status and availability.

Q. Residents of Portland

1. In the event of a large earthquake, residents must be prepared to be self sufficient for no less than five days following the event. Individuals and households play an important role in the overall emergency management strategy. Community members can contribute by:

    1) ***Reducing hazards in and around their homes.*** By taking simple actions such as securing water heaters, refrigerators, furnaces and free-standing furniture to walls; installing an automatic gas shut-off valve triggered by strong vibrations and flexible pipe fittings to avoid gas rupture and securing cabinets with latches, people can reduce the amount of damage to their home caused by an earthquake.
        - Check your home's earthquake fitness – Is your house properly bolted to its foundation? Do you need to reinforce a cripple wall with plywood? Have you checked for faulty materials in the concrete or wood framing?
        - Your home may qualify for earthquake insurance depending on (among other things) its location, age, and construction type.

    2) ***Preparing an emergency supply kit and household emergency plan.*** By developing a household emergency plan and assembling disaster supplies in advance of an event, people can take care of themselves until assistance arrives. This includes supplies for household pets and service animals. In addition to food, water, first aid and medical supplies (including extra prescription medicines), warm clothes/blankets, sturdy boots, flashlight and battery or hand-powered radio, residents should also consider emergency sanitation supplies including two five gallon buckets, toilet seats and organic matter such as shredded newspaper, woodchips or untreated sawdust.
        - Smartphones and other mobile devices offer opportunities to store and access emergency information at any time. Save your family's emergency communication and reunification plan on your smartphone or similar device. Free mobile apps for Android or iPhone offer useful information for emergency events: FEMA mobile app, S.O.S emergency support by the Red Cross, American Red Cross Shelter View.

    3) ***Following emergency information carefully.*** Throughout an emergency, critical information and direction will be disseminated to the public via various media. By carefully following the directions provided, residents can reduce their risk of injury, keep emergency routes open to response personnel and reduce demands on landline and cellular communication.

4) ***Volunteering with an established organization.*** By volunteering with an established voluntary agency, individuals and households become part of the emergency management system and ensure that their efforts are directed where they are most needed.

5) ***Enrolling in emergency preparedness training courses.*** Emergency preparedness training, such as Neighborhood Emergency Team program, will enable residents to take initial response actions required to take care of themselves and their households, thus allowing first responders to focus on higher priority tasks that affect the entire community. All residents are encouraged to familiarize themselves with how to:

   i. Extinguish small fires with extinguishers.

   ii. Shut off gas and water valves when appropriate.

   iii. Cordon off hazardous areas: (broken glass, large cracks in streets/sidewalks, downed power lines, etc).

   iv. Conduct a search of homes with damage and check to see if neighbors need help.

VI. DIRECTION & CONTROL

A. Incident Command / EOC

1. Portland Fire & Rescue, Portland Police Bureau, Portland Bureau of Transportation and the Water Bureau will share incident command responsibilities during the initial response to a large earthquake. Incident Command bureaus will likely change as the emergency situation is stabilized and the emergency response transitions to recovery.

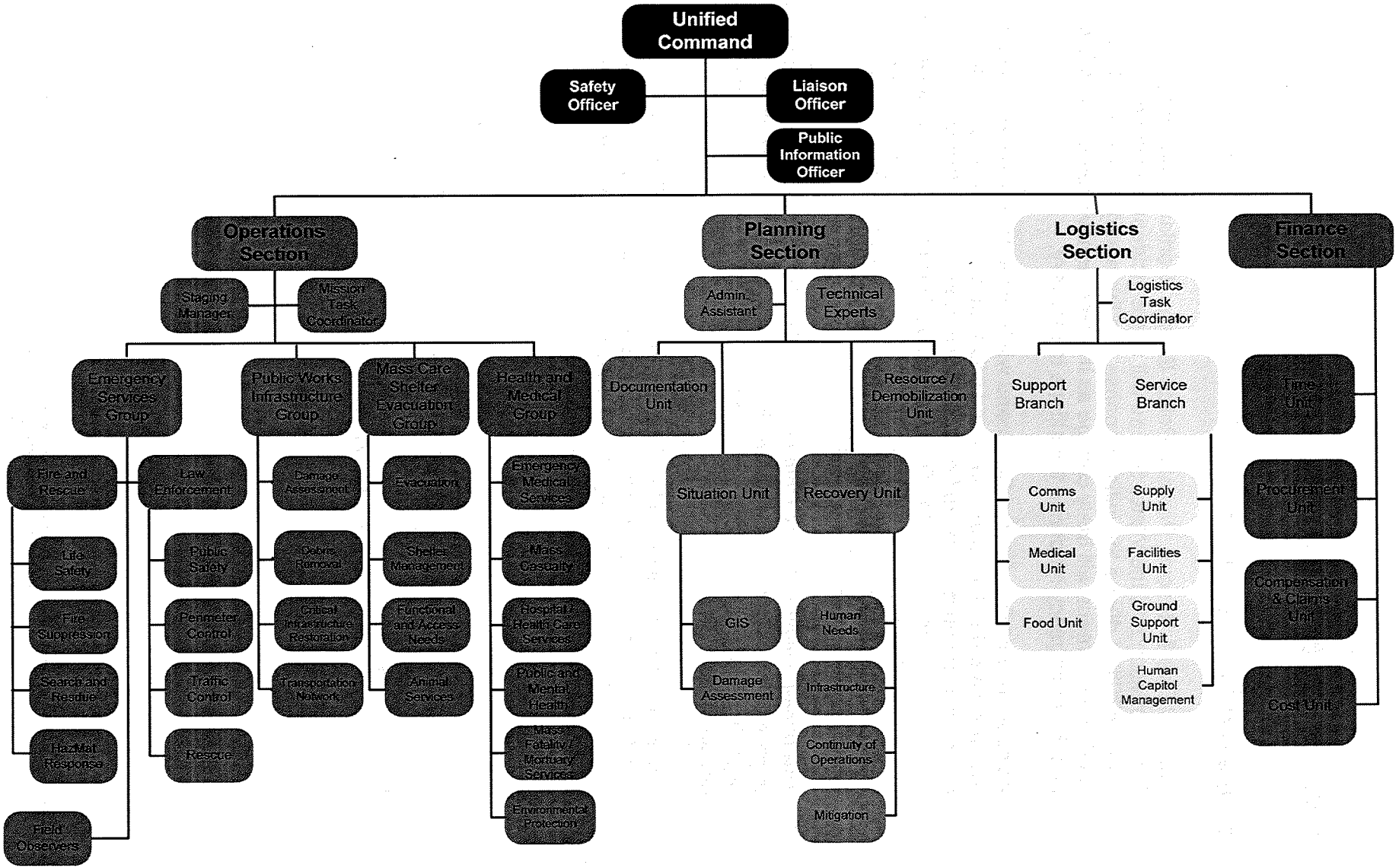
2. As soon as possible, Unified Command will be established to determine and execute citywide objectives, plans and priorities. Due to the size and the complexity of damage created by a major earthquake, establishing an incident command post in the field may not be feasible. It may be necessary to transition the ECC to a command post or EOC. The ECC Manager and Unified Command will examine the circumstances and make a decision based on the needs of the situation.

3. The Mayor, Disaster Policy Council and PBEM Director will meet as required to provide oversight of citywide needs, providing policy level decisions regarding response priorities, safety and security and continuity of essential city services.

4. The Mayor and members of the Disaster Policy Council will face challenges initiating recovery while directly addressing the immediate needs of the community, working within significant fiscal constraints, and addressing employee shortages. Facilities owned by the City may be damaged in a moderate to large earthquake, hampering normal response and recovery actions. Damage may occur to the structure of buildings, equipment, building contents and vital records.

5. The issues faced and the decisions made by the Mayor and the Disaster Policy Council must ensure the continuity of operations for city government that ensures adequate staffing and resources, expedited decision-making, and streamlined procedures for recovery.

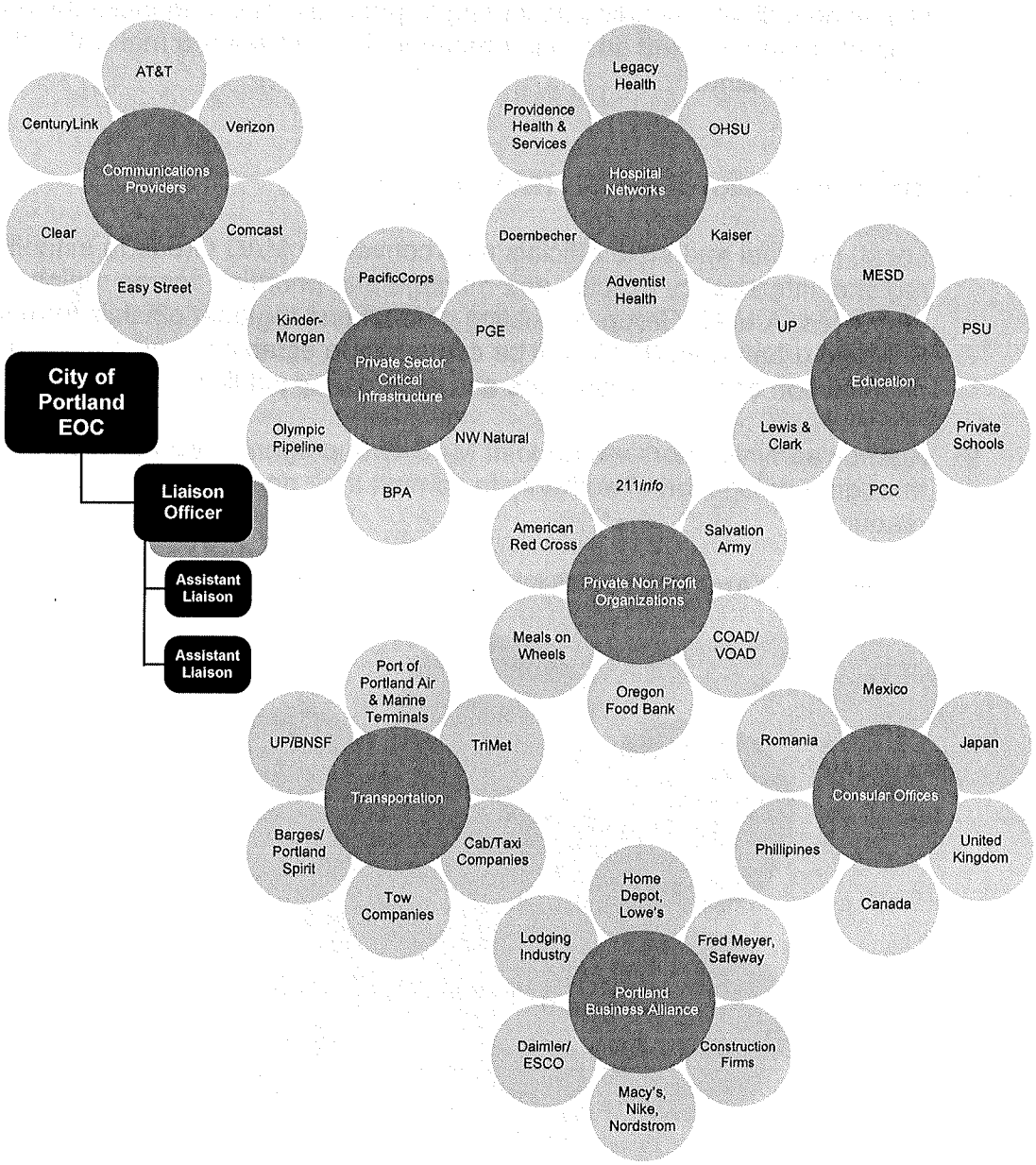
Figure VI-1 Full EOC Activation



B. Liaison Officer

1. The Liaison Officer (LNO) serves as the point of contact for agency representatives from assisting organizations and agencies outside the City. The LNO assists Incident/Unified Command in determining how to incorporate outside agencies into citywide response and recovery operations and objectives.

Figure VI-2 Liaison Officer



The agencies identified above are representative of a larger list of participants involved in disaster management.

C. Area Command

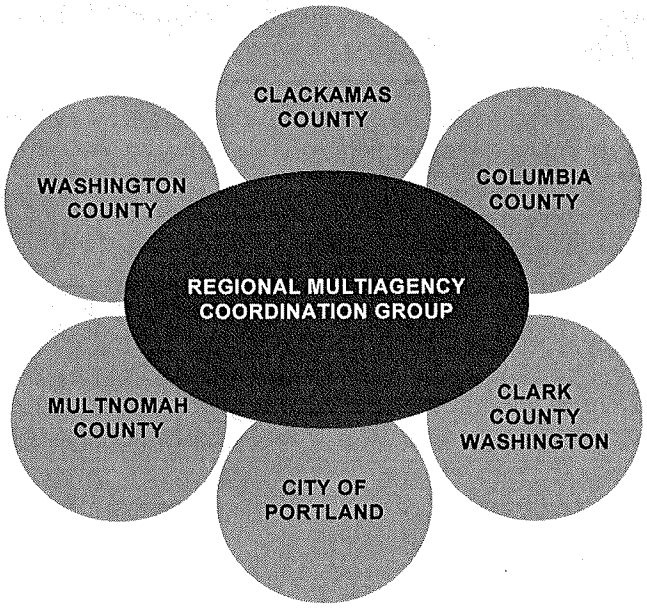
1. A large earthquake may produce widespread damage that results in multiple incidents within an impacted area. If necessary, an Area Command will be established to oversee the management of multiple Incident Command Posts and will have the responsibility for: setting overall strategy and priorities, allocating critical resources according to priorities, ensuring incidents are properly managed and ensuring operational objectives are met within their area of command.

D. Multiagency Coordination (MAC) Group

1. Local, regional and state officials may convene a MAC Group to establish regional interagency policies and manage and prioritize scarce regional resources. A MAC Group consisting of local and regional officials from the Portland urban area (PUA) will be convened to establish regional policies, prioritization of scarce resources and emergency public information.

2. Agency administrators will appoint MAC Group agency representatives through a delegation of authority to commit their agency funds and resources.

Figure VI-3 Portland Urban Area Regional Multiagency Coordination Group



3. The primary functions of the MAC Group are to:

   a) Support regional incident management policies and priorities.

   b) Facilitate logistical support and resource tracking of scarce regional resources.

   c) Inform resource allocation decisions using incident management priorities.

   d) Coordinate incident-related information.

   e) Coordinate and resolve interagency and intergovernmental issues regarding incident management policies, priorities and strategies.

E. Integration of Local, State and Federal Response Agency Personnel

1. The impact of a large earthquake will require coordination with local, state and federal agencies. As the response effort unfolds, additional resources and personnel will be requested.

2. The City will coordinate the request for an emergency through Multnomah County. State assistance may be provided after local resources are exhausted, nearing depletion, or projected to be inadequate and mutual aid agreements have been initiated. Additional requests for assistance may be coordinated through the Regional MAC Group or thru Multnomah County Emergency Coordination Center in close coordination with the State Emergency Coordination Center and the Federal Joint Field Office.

3. In the event that the capabilities of the state are not sufficient to meet the requirements as determined by the governor, federal assistance may be requested. The governor will submit a presidential request for assistance in accordance with the National Response Framework (NRF). Under the NRF, FEMA will begin coordinating the mobilization of federal resources that will be necessary to support local and state response activities within the affected region.

4. As soon as possible, FEMA will establish a joint field office (JFO) with its federal partners and state emergency management and will become the focal point of federal response operations.

5. Personnel and resources from local, state and federal agencies will integrate into incident command posts, area command and the City EOC, augmenting existing capabilities to effectively respond to the event.

6. Federal support may include direct assistance from federal agencies such as the U.S. Army Corps of Engineers or from specialized teams, such as USAR, DMATs and DMORTs.

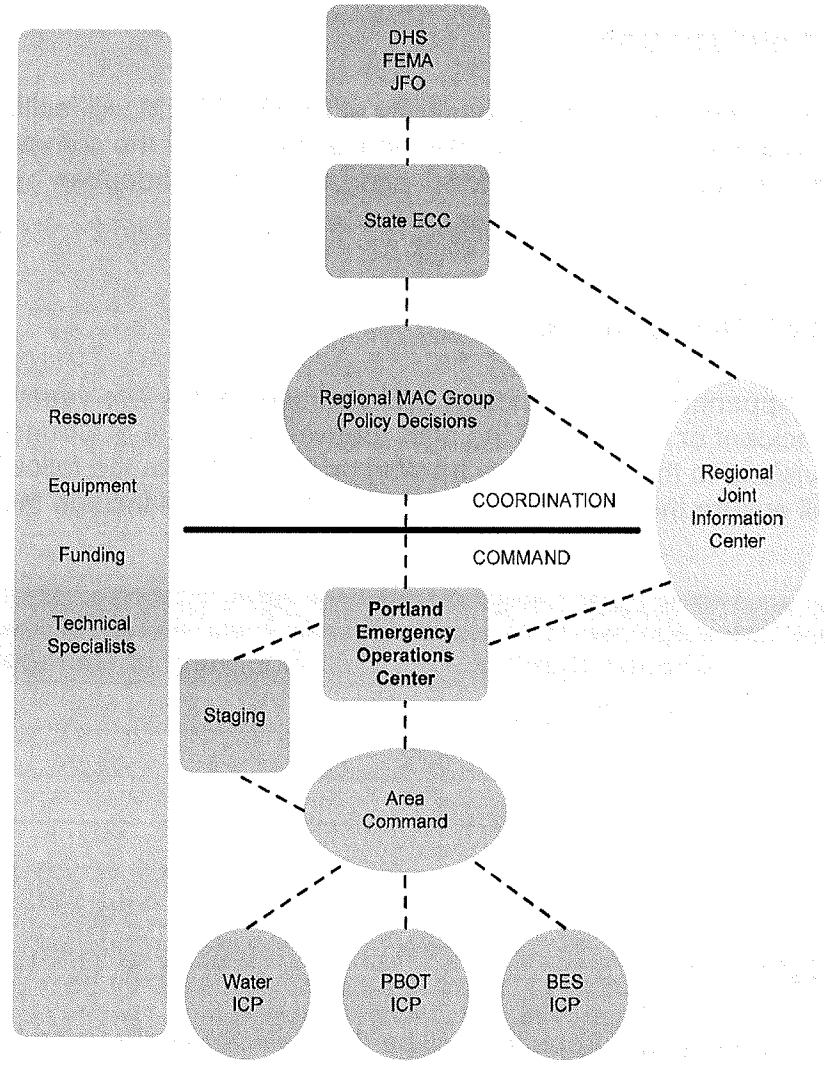
7. FEMA may deploy an Incident Management Assistance Team (IMAT) to coordinate with state and local officials to identify needs and shortfalls impacting disaster response and recovery. FEMA may also dispatch a Mobile Emergency Response Support (MERS) team, including an emergency operations vehicle, to provide self-sustaining telecommunications, logistics and operations support elements.

8. FEMA also has commodities staged at locations throughout the state and throughout the country to supplement supplies of the American Red Cross, Salvation Army and other voluntary agencies should their resources become depleted.

9. Activation of Emergency Support Function (ESF) 8 authorizes the U.S. Department of Health and Human Services to coordinate hospital medical needs and patient evacuations, if necessary.

10. The integration of these teams and resources into Portland operations will be coordinated by the appropriate City EOC Section. The Logistics Section will coordinate logistics requirements with the deployment of these teams.

Figure VI-4 Local, State and Federal Coordination



VII. PLAN DEVELOPMENT & MAINTENANCE

A. Plan Administration

The update of this appendix is the responsibility of PBEM. PBEM will facilitate the vetting and coordination of this appendix with stakeholders and the community. All plans will be reviewed and approved by the EMSC and DPC prior to adoption by Portland City Council.

B. Record of Plan Changes

The Earthquake Appendix will be reviewed and approved every five years or as needed after an actual incident or exercise of the plan. Between the date of Council adoption, updates and revisions to the plan will be tracked and recorded in the following table. This process will ensure the most recent version of the plan will include these changes.

Table VII-1 - Record of Plan Changes for the Earthquake Appendix

Date	Change Number	Summary of Changes
April 2012	Original Release	

C. Plan Distribution

Distribution of the Earthquake Appendix will be done electronically using the Adobe Portable Document Format (.PDF) version 8 or later. The Earthquake Appendix will be posted on the www.portlandoregon.gov/bem intranet website. Electronic copies will contain ***hyperlinked text*** (in blue) that will allow users to immediately jump to other portions of the document or to associated information on the Internet. Paper copies will not be distributed but will be available upon request.

VIII. AUTHORITIES & REFERENCES

- Portland City Code Chapter 5.33.130 - Emergency Procurements.
- Portland City Code Chapter 5.33.135 - Declaration of State of Emergency or Disaster.
- Portland City Code Chapter 14C.30 – General Procedures and Authority of the Bureau of Police.
- Portland City Code Chapter 24.85 – Seismic Design Requirements for Existing Buildings.
- Oregon Revised Statutes Chapter 176, Section 750-820
- Oregon Petroleum Contingency Plan
- City of Portland Traumatic Event Management Guideline
- Portland Local Energy Assurance Plan (LEAP).
- City of Portland, Bureau of Development Services Damage Assessment Plan.
- Portland Fire and Rescue General Order #3, Operational Guidelines 2.8 Mass Casualty Incident and Multiple Patient Scene September, 23, 2008; 6.2 Structural Collapse Tactical Plan, January 23, 2006; and, 6.7 Earthquake Emergency Operations Tactical Plan, July 26, 2006.
- Police Directives 785.00 Earthquake Procedures and 790.00 Evacuation Procedures, Portland Police Bureau.
- Post-Earthquake Bridge Inspection Response Plan, Portland Bureau of Transportation, October, 2009.
- Memorandum of Understanding, Emergency Transportation Routes Earthquake Damage Assessment and Coordination Portland, Oregon/Vancouver, Washington Regional Area No. 21,273 and City of Portland Ordinance No. 180656.
- Regional Water Providers Consortium
- Oregon Regional Water/Wastewater Agency Response Network (ORWARN)
- Portland Metropolitan Area Transportation (PMAT) Co-Operative Intergovernmental Agreement
- Portland Region Animal Shelter Plan December, 2010.
- Multnomah County Health Department, Public Health Emergency Response Plan and Emergency Medical Services 2011 Patient Treatment Protocols.
- Multnomah County Health Department Emergency Operations Plan – Tab C Medical Care Points, Tab O Mass Fatalities, and Multnomah County Emergency Medical Services 2011 Patient Treatment Protocols.