Portland Transportation Recovery Plan

Version 1.0
July 2018

CITY OF PORTLAND, OREGON 1851

PBEM

Portland State UNIVERSITY

PORTLAND TRANSPORTATION RECOVERY PLAN
VERSION 1.0
JULY 2018

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TREC
Transportation Insight for Vibrant Communities
at
Portland State
UNIVERSITY

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1. INTRODUCTION

A. SUMMARY

Recovery is the process of restoring the economic and social functions of a community following a natural or human-induced hazard incident. The Portland Transportation Recovery Plan (the Plan) provides an integrated process and associated actions for the City of Portland, Oregon (the City[1]) to transition from emergency response procedures after an incident to mobility recovery strategies emphasizing the use of transit, travel demand management (TDM), social media, and intelligent transportation systems (ITS) technologies.

A significant incident has the potential to disrupt the economic and social wellbeing of not only the city but also the larger region and beyond for not just days but years. Having an agreed-upon plan for advancing recovery strategies and a commitment by affected agencies to broaden the recovery framework moving forward is critical.

An Advisory Committee consisting of representatives from the Portland Bureau of Emergency Management (PBEM), Portland Bureau of Transportation (PBOT), TriMet, Multnomah County, Oregon Department of Transportation-Region 1, Go Lloyd, and Metro provided input throughout the development of the Plan. The involvement of these agencies was critical as each plays a major role in response to hazard incidents and will continue to do so in recovery as restoration of supply chains and transportation routes from other jurisdictions is essential for the city's recovery. Figure 1.1 presents the established emergency management structure for transportation that will be in place during the response phases.

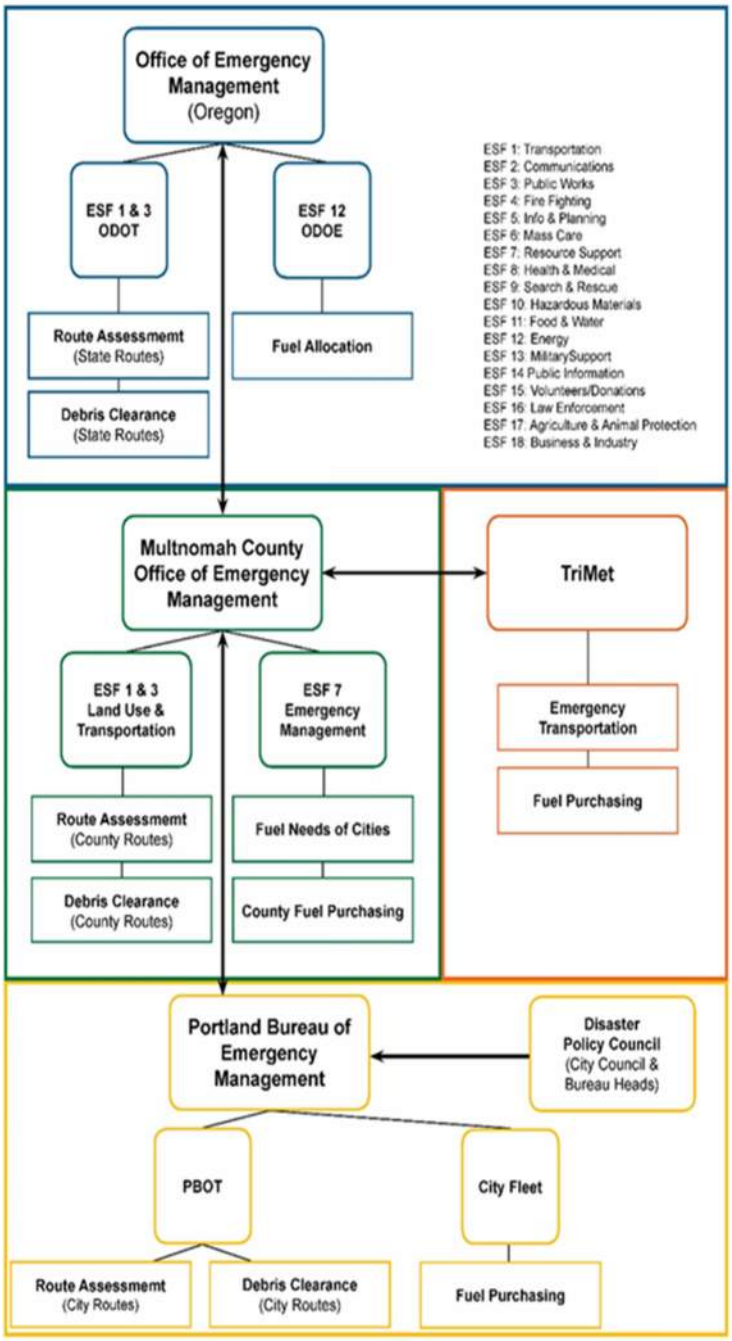

Figure 1.1 Emergency Management Structure – Transportation Full Activation

[1] Throughout the Plan, "City" refers to the City of Portland as a corporate entity and "city" refers to Portland as a place/community comprised of citizens, businesses, and public and not-for-profit institutions.

Multiple workshops were held with the Plan's Advisory Committee members, including tabletop exercises, which were conducted to assess the ability of the Plan to effectively provide the necessary direction to agencies during the recovery period. The tabletop exercises evolved from Committee discussions about the needs, existing programs, and available resources for the process of restoring normal and (where appropriate) improved functionality to the surface transportation system (i.e., roadways, bridges, tunnels, and passenger rail systems). The details incorporated into the tabletop simulations provided the insights required to revise the recommended actions contained in the Plan.

Figure 1.2 Five Phases of Emergency Management

The Plan is based on the acknowledgment of three key factors: 1) recovery is distinct from response; 2) recovery presents opportunities to increase safety, reliability, resilience, and equity; and 3) the exact severity and extent of specific incidents cannot be anticipated. Each of these factors is discussed in detail below.

- Recovery versus Response – A major difference between recovery and response is the transition from a command and management framework to a management and planning framework. The approach and framework for advancing recovery efforts is distinct from those employed in the response to an incident, which emphasizes actions to reduce loss of life, injuries, and property damage. While this distinction exists, there is some overlap between the later stages of emergency response and initial emergency recovery actions, especially in incidents that are of a shorter timeframe like a winter storm. A common example is the continued clearance and restoration of emergency transportation routes (ETRs) as not all may be able to be opened during what is considered the response phase. Figure 1.2 presents the five phases of emergency management as displayed in the City of Portland's 2016 Mitigation Action Plan. The goal of the Plan is to restore the economic and social functions of the City as quickly as possible.
- Rebuilding Better – As the City of Portland conducts recovery, an important consideration will be to restore existing elements of the transportation system (infrastructure and services) that functioned as desired prior to the incident and implement planned improvements whenever possible. This will ensure that opportunities to increase safety, reliability, efficiency, resiliency, and equity are fully maximized. The net result of recovery should be a transportation system that works better and serves the community better than before the disaster.
- Applicability of the Plan to All-Hazards – The Plan is intended to be flexible enough to adapt to recovery needs resulting from a variety of types of incidents. Four incidents were chosen as examples due to past or likely occurrence. They are detailed in "Chapter 3. Incidents." Using these incidents to develop an approach and actions to address the recovery activities

that will likely be required ensures the adequacy of the Plan to the maximum extent practicable irrespective of the incident that occurs. It should be acknowledged that incidents, whether predicted or occurring without warning, pose challenges that cannot be anticipated.

Going forward, the City of Portland will work with multiple agencies to develop a broader infrastructure recovery framework and governance strategy based on changes in technology, internal capacity, and other factors that directly influence the ability to restore and improve the pre-event functioning of the city's transportation system. This will allow the Plan to take advantage of improved conditions assessments and modeling, incorporate actions that more explicitly incorporate freight and goods movement, ascribe responsibilities for actions, and integrate additional organizations from the not-for-profit and private sectors.

The Plan is developed to focus on transportation recovery. As the City of Portland and the Greater Portland Region develop Community Recovery Plans, it will be important to align future transportation recovery efforts with the vision and goals of those plans.

B. Organization of the Plan

The Plan is organized into the following seven chapters:

1. Introduction – The current chapter discusses the purpose of the Plan, the guiding principles that serve as the key tenets that will ensure it meets the intended purpose, and the roles and responsibilities of key agencies and organizations that will be involved in transportation recovery in the city should the need arise.
2. Incidents – Summarizes the background and projected extent/severity of the hazard types that are expected to have longer lasting recovery periods and, therefore, serve as the basis for the strategies of the Plan. These include Moderate/High-Intensity Earthquake, Landslides, Flood, and Homeland Security Incident.
3. Transportation Routes & Employment Centers – Describes the boundaries, major employers/key economic clusters and sectors, governmental functions, and major transportation facilities of five focal points within the city that are also central to the well-being of Multnomah County and the Portland Metropolitan Region.
4. Portland Transportation Alternatives Prioritization Tool – Describes the methodology used to create the decision-making support application that can be customized to prioritize transportation improvements for all highway and transit facilities in the city based on user-defined weighting of three major criteria that address usage, access, and equity.
5. Recommended Actions – Constitutes the bulk of the Plan with strategies organized around seven categories each with a checklist of key items and associated tasks/actions to be undertaken both proactively before an incident and during recovery.
6. Potential Funding & Reimbursement – Discusses potential sources of funding to assist in the implementation of transportation improvements during recovery, recognizing that specific programs at the state and federal levels are created, modified, and removed as new administrations advance their priorities via annual budgets.
7. Follow-On Activities – Identifies the next steps in the recovery planning process including adoption of the Plan and the establishment of

a schedule to develop a broader recovery framework and governance strategy based on progress made in implementing the pre-event tasks/actions of the strategies.

C. GUIDING PRINCIPLES

- Equitable – Historically underserved communities of concern are disproportionately impacted by incidents. These communities include persons of color, low-income persons, persons with disabilities, persons with limited English proficiency, children, and older adults. This requires additional emphasis on equity in the recovery process to ensure that the needs of all users are met. Equity is a hallmark of the city's approach to all of its planning and development activities. Accordingly, the Plan integrates equity throughout the development of the recommended actions and in the methodology of the Alternatives Prioritization Tool.
- Improved – The overarching goal of the Plan is to restore the functioning of the transportation system as quickly as possible following an incident to support economic and social functions and services of the city and the region. It is important to recognize that many decisions made during recovery with respect to infrastructure will have decades-long impacts. Accordingly, decisions must be made in an expedient manner and result in both near-term and long-term benefits. These opportunities can create improvements and result in a more resilient and livable city. Future improvements from existing plans that enhance the functioning of the system are integral to the recovery process.
- Safe – Despite the potential damage to much of the city's transportation infrastructure, it is essential that any new routes or services developed for the Transportation Recovery Plan be safe and negotiable for all users; particularly, those travelling on foot and bicycle, people with disabilities using mobility devices, and youth and seniors.
- Shared – If an incident reduces the carrying capacity of infrastructure and services, increased sharing of vehicles, bicycles, and other means of transport will be key to restoring mobility. Beyond traditional public transportation, ridesharing (carpools and vanpools), carsharing, bikesharing, and trip making via transportation network companies, are shared mobility services that are already present within the city. Flexible, customized demand-responsive forms of transit are being experimented with by a growing number of companies with mixed results. Shared mobility is not limited to people. Courier network services could be increased for the delivery of essential goods like food and medicine.
- Smart – Technology can and should play an important role in maximizing the usefulness of available infrastructure and services during recovery. Increased coordination among agencies and, to the extent possible, interoperability of deployed ITS assets among key public agency stakeholders are critical. Emerging technologies are rapidly changing how people interact with the transportation system and how a city can provide services. An assessment of what technologies are currently and likely to be available after the incident and how quickly those technologies can be relied upon will be conducted.
- Social –The ability to provide information and receive feedback quickly and efficiently will take on increased importance during the recovery process, resulting in new lines and methods of communication, including crowdsourcing. The ability of social media to

create this continuous dialogue between agencies, employers, and the public will be invaluable. However, it is imperative that effective communication to those without access to or active on social media be a priority as well.

D. Roles & Responsibilities

Clarity of purpose is vital to successful recovery efforts. This applies to both agencies and individuals within the respective divisions of the agencies. Agency roles and responsibilities should incorporate consideration of response activities and interactions with associated personnel prior to commencing recovery efforts. This includes response activities that continue into recovery such as damage assessments, debris clearance, and other tasks.

A Transportation Recovery Working Group of City, County, Regional, and State agencies and organizations will be formed to review, assess, and make recommendations on the scope, schedule, and phasing of improvements during recovery efforts. PBOT would facilitate the activities of the group, ensuring that the city's needs are integrated into county, regional, and state recovery activities.

During the development of the Plan, it became clear that overly prescriptive roles and activities are not desirable prior to an incident. Contrasting examples include a major earthquake incident that requires a multi-year (or even decades-long) restoration effort compared to flooding in which infrastructure and services can be returned to pre-incident functionality within a matter of days or weeks. Given the wide variety and duration of potential events, roles and activities must maintain an appropriate amount of flexibility.

Transportation Recovery Working Group

The Transportation Recovery Working Group (TRWG) that will be activated by and report to the City of Portland's Disaster Policy Council. The agencies that will serve as members along with an overview of their expected functions include:

- Portland Bureau of Transportation (PBOT) – Planning, developing, inspecting, maintaining, and operating all City-owned transportation assets including roads, bridges; coordination with Portland Streetcar; oversight of aerial tram and Biketown facilities; and regulation of City-licensed private-for-hire, car-sharing (e.g., Car2Go, ReachNow & Zip Car), and ride sharing services. In addition, PBOT will provide citywide traffic management operations, incident response, and setting of traffic and parking regulations.

  PBOT will coordinate TRWG activities with its own intra-bureau stakeholders and other City bureaus (including, but not limited to, the Portland Bureau of Planning and Sustainability, Bureau of Environmental Services, and Portland Water Bureau), as well as external entities such as utility companies.

During the development of the Plan it became clear that overly prescriptive roles and activities are not desirable prior to an incident.

- TriMet – Planning, developing, inspecting, maintaining, and operating MAX and bus transit services and elderly and disabled transportation services (including contracted vendors), and repairing system infrastructure including track, signals, platforms, power, stations, etc., as well as the TriMet fleet. TriMet will provide a liaison that will

communicate decisions of the TRWG to key TriMet personnel in the scheduling/routing, capital projects, and field operations groups.

- Multnomah County Transportation Division – Planning, developing, inspecting, maintaining, and operating all County-owned transportation assets including roads, bridges, and social services transportation (inclusive of oversight of contracted providers), as well as enforcing road closures.
- Oregon Department of Transportation (ODOT) – Planning, developing, inspecting, maintaining, and operating all state-owned transportation assets including roads, bridges, tunnels, and oversight of airport, marine port, intercity rail systems, and pipelines. In addition, ODOT will provide regional traffic management operations and incident response, as well as oversee statewide emergency operations.
- Port of Portland – Planning, developing, inspecting, maintaining, and operating all Port-owned transportation assets and facilities including airport terminals, marine terminals, roadways and bridges, as well as emergency management for Port tenants. Planning personnel will serve as a liaison to the TRWG to provide input and ensure Port operational requirements are considered in the recovery process.
- Metro – Coordination of transportation recovery activities with near- and long range regional multimodal transportation priorities and capabilities. Support from the Metro Data Resource Center can fill vital needs related to assessing progress and providing the necessary analysis to determine next steps and any needed course corrections.
- Portland Bureau of Emergency Management (PBEM) – Initial focal point of all response and recovery efforts for the City of Portland, coordinating the activities of the TRWG to ensure adherence to the collaborative planning efforts intended to address the needs of the city (including the forthcoming Recovery Framework for the City of Portland) and the larger region.
- Regional Disaster Preparedness Organization (RDPO) – Serves as a collaborative forum for increasing the resiliency of the five-county Portland Metropolitan Region to disasters and is currently developing a framework for recovery. The RDPO has formed a Resource Management Committee that is conducting a critical facilities assessment that incorporates logistics and movement of goods and supplies if the region is impacted by an incident. RDPO also facilitates the Emergency Managers Work Group (REMTEC).

Stakeholders

The TRWG will interface with major employers, economic development organizations, and other key community stakeholders. The TRWG should establish a stakeholder group to interface with and to solicit input into further revisions of the Plan.

As the economic and urban development agency for the City, Prosper Portland will be a significant resource for communicating employers' needs and providing information to them on the availability of infrastructure and services, as well as assisting in setting up remote employment locations for displaced employees. Prosper Portland can also provide proactive communication to employers about the Plan so they are aware of its recommendations and protocols prior to an incident.

Portland State University has provided expertise and support in developing the Plan. As a major employer, the Transportation and Parking Services section provides discounted transit passes and free bike rentals for students, and parking within the University's garages.

Oregon Health & Sciences University (the city's largest employer) oversees ambulatory and private-for-hire services for patients and for emergency management, which is vital to the overall economy and public health of the city. Participation will ensure that transportation needs and opportunities at multiple locations around the city are accounted for and incorporated into overall transportation recovery decision making.

Transportation Management Associations (TMAs) provide information and coordinating and assisting businesses and their employees with local transportation options such as carpool-matching, transit, car-sharing, bike trip planning, ride-sharing, private-for-hire, and other services. Go Lloyd, Columbia Corridor Association, and Explore Washington Park serve as TMAs and their participation will be vital in disseminating information on the availability of transportation infrastructure and services as recovery progresses.

Regulated Private (including Transportation Network Companies) and Not-for-Profit Transportation Services provide transportation on an on-demand basis as well as through contracts for transporting seniors and persons with disabilities. Their on-the-ground input from operators (i.e., drivers) and scheduling/dispatch personnel will be sought to gather insights into impacts on motorists that can be integrated into the transportation recovery process.

Other key stakeholders include but are not limited to, Portland Public Schools, Portland Bureau of Planning and Sustainability, Portland Water Bureau, Portland Police Bureau, and Portland Bureau of Environmental Services, hospitals, the Arc of Multnomah County, other state agencies and surrounding local jurisdictions and the Oregon National Guard, as necessary.

E. Existing Plans & Future Efforts

The City of Portland and its state, county, and special district partner agencies have conducted significant planning that closely aligns with objectives related to economic development, quality of life, and social equity. The Plan builds on these efforts. Many of these planning efforts have utilized objectives, protocols, and case studies of the experiences of communities involved in similar emergency transportation response and recovery initiatives throughout the world.

Key Adopted Plans and Current Guidelines

A number of adopted plans were reviewed to ensure the Plan is consistent with and complements agreed upon principles, initiatives, and recommendations. Several of these, including ones related to emergency management, are integral to the strategies of the Plan. It is important to note that the adopted emergency management plans are intended to address needs related to preparation and response. As a result, there is a minimal amount of discussion on transportation recovery and associated activities included in these plans. This is to be expected as the predominant amount of attention is focused on increasing resiliency to proactively reduce the negative impacts of incidents before they occur and then to ensure that life and property are protected to the greatest extent practical immediately after an incident.

Existing research and guidelines on transportation recovery planning and examples from elsewhere are limited compared to mitigation and response initiatives. Accordingly, Portland is ahead of other communities in developing a pragmatic, action-oriented recovery plan for its transportation system. Summaries of several key plans that were consulted in the development of the Plan are provided below.

Portland-Specific

1. *Mitigation Action Plan [MAP], PBEM, 2016*

   The MAP served as the primary resource for understanding the types of hazards that can occur, their probability of occurrence, and the resulting extent and severity of their related impacts on people, property, and the economy. The five incidents that were deemed high and medium risks to the city (based on probability and impacts) are:

   - Severe Weather (High)
   - Earthquake (High)
   - Landslide (Medium)
   - Wildfire (Medium)
   - Flood (Medium)

   In terms of actions relevant to transportation recovery, the MAP recommended that PBOT "identify transportation routes that are likely to be impacted by landslides and identify potential alternate routes based on most likely scenarios" and "design and build a facility for PBOT Operations that can operate as a Bureau Incident Command Post following a large earthquake. Move existing road clearing equipment to a facility that is not subject to freeway ramp collapse."

2. *2035 Comprehensive Plan, City of Portland, 2016*

   The vision for a prosperous, healthy, equitable, and resilient city is supported by the five guiding principles of Economic Prosperity, Human Health, Environmental Health, Equity, and Resilience. Each of these Comprehensive Plan guiding principles is integrated into the actions of the Plan to ensure consistency with the desired course for the city's physical development. Components of the guiding principles that are relevant to transportation recovery include:

   - Increase access to complete neighborhoods (Human Health)
   - Build City Greenways (Human Health)
   - Support nature-friendly infrastructure (Environmental Health)
   - Make infrastructure decisions that advance equity (Equity)
   - Focusing growth in centers and corridors (Resilience)

   Chapter 9 contains the transportation goals and policies, which include the street design and policy classifications that (along with designated Emergency Transportation Routes) serve as the basis for calculating the "usage" component of the Alternatives Prioritization Tool developed for this Plan. Chapter 3 (Urban Form) and Chapter 4 (Design and Development) also include transportation policies that influence the strategies included herein. Significant projects are contained in the Transportation Systems Plan and were reviewed relevant to potential recovery activities, including identifying those projects that are located in high liquefaction areas.

3. *Basic Emergency Operations Plan (BEOP), PBEM, 2016*

   Serves as the core document of the City's Comprehensive Emergency Management Plan, creating a framework for citywide coordination with Functional Annexes for various response capabilities. This framework is critical to the restoration of infrastructure and services and recovery. Along with other City bureaus, PBOT's emergency responsibilities are designated within the document. TriMet, Metro, and the Port of Portland are mentioned among mutual aid agencies and organizations that represent critical infrastructure sectors. Cooperative assistance agreements for the provision of mutual aid for public works (including transportation) are listed in the

Administration, Finance, and Logistics component of the BEOP. This delineation of roles and responsibilities between City entities and other partners are integral to transportation recovery efforts and the Plan is consistent with them.

4. *Portland Transportation System Plan, PBOT 2018*

   Articulates the city's 20-year plan for its multi-modal transportation system. It identifies city transportation policies, route classifications, design practices, and its short-term, medium-term, and long-term investments. It is fully integrated with the city's 2035 Comprehensive Plan and is coordinated with state and regional transportation plans. With regard to transportation recovery after an incident, the TSP has identified three types of emergency response routes: Major Emergency Response Streets (intended to serve primarily the longer, most direct legs of emergency response trips); Secondary Emergency Response Streets (intended to provide alternatives to Major Emergency Response Streets in cases when traffic congestion, construction, or other events occur that may cause undue delays in response times); and Minor Emergency Response Streets (intended to serve primarily the shorter legs of emergency response trips).

Portland-Relevant

5. *TriMet Emergency Management Plan Revision 7, March 2017*

   This plan covers all five phases of emergency management, providing general actions for each phase. A "Basic Plan" for all types of incidents includes the following nine sections along with attachments for NIMS Compliance Certification and EOC Staff Notification:

   - Objectives
   - Medical Treatment
   - Reasonable Operational Assumptions
   - Execution
   - Logistics
   - Administration (including reporting requirements)
   - Command and Control
   - Personnel
   - Communications

   "Hazard-specific checklists" provide procedures to be followed for 18 types of potential threats that are categorized as "Large-Scale Mishaps," "Natural Disasters," and "Human-Caused Disasters."

6. *Oregon Resilience Plan, Oregon Seismic Safety Policy Advisory Commission, 2013*

   The transportation section concentrates on the recovery of the transportation system following a major Cascadia subduction zone earthquake. "The plan's recommendations highlight ways to close the gap that separates expected and desired performance" of a resilient state. The transportation system is seen as vulnerable to this type of incident from a recovery standpoint in that "the resulting lack of mobility will have direct impacts that severely limit…the state's ability to restore services leading to recovery." In short, the capabilities of the transportation system following a disaster is directly related to the state or local jurisdiction's ability to access and restore services leading to a recovery.

   As the title of the document suggests, its primary purpose is to identify strategies to improve resilience. This is accomplished within the context of what will benefit response and also recovery by providing a core network that is better positioned to withstand incidents. A "backbone" system of highways of statewide significance is identified that, when combined with other modes, will provide the greatest benefit in response and recovery at the lowest

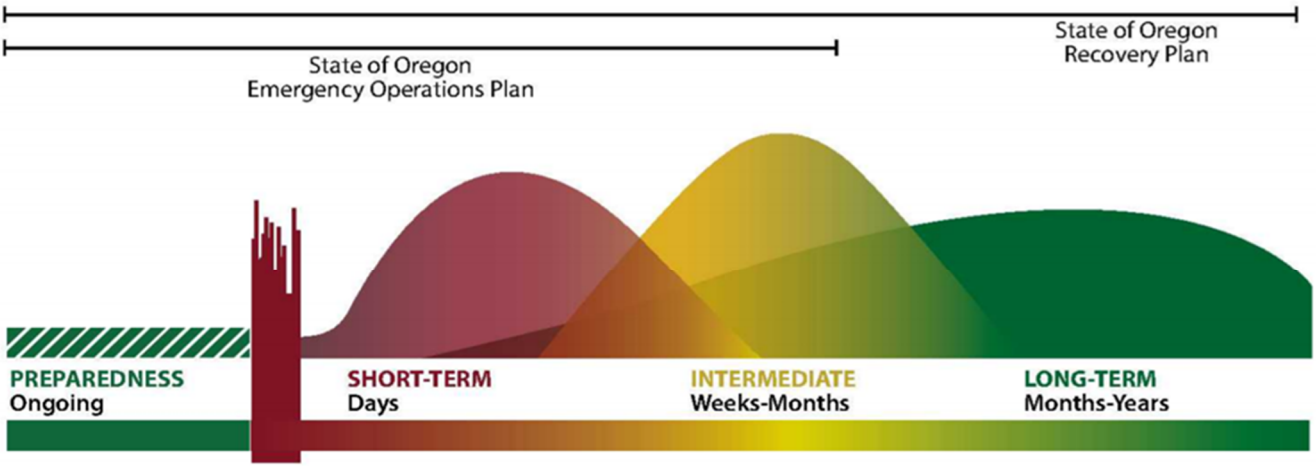

Figure 1.3 Recovery Continuum

retrofit cost. This includes I-5 from I-84 to OR 58 and I-84 from I-5 to U.S. 97, encompassing the major interstates that serve the city.

7. *Oregon Recovery Plan, Oregon Office of Emergency Management, 2014*

   This plan "[d]elineates the policies, procedures, and organizational structures that the state will use in coordinating state recovery activities in support of local and tribal partners, community-based organizations, and the private sector." It acknowledges that primary responsibility rests with local governments and state efforts are "supplementary and complementary." Like this Plan, the Oregon Recovery Plan covers all hazard types but will likely be implemented after a large-scale incident (a 9.0 Cascadia Subduction Zone earthquake is noted as the "maximum probable scenario"). Figure 1.3 presents the "Recovery Continuum" that the City will follow in addressing the impacts of an incident following emergency response.

   The bulk of the document is comprised of seven State Recovery Function Annexes, including one for Infrastructure Systems. Consistent with this Plan, the responsibilities of the Oregon Department of Energy include items related to petroleum supply, distribution, and rationing and those for the Oregon Department of Transportation include technical assistance for engineering, long range planning, and administration of funding programs (which are listed in the appendix).

8. *Portland Area Threat and Hazard Identification and Risk Assessment (THIRA) Update, RDPO, 2015*

   Represents a process for creating a common understanding of risks to determine what the region needs to prepare for and what essential capabilities and resources are required. Infrastructure systems were identified in the National Preparedness Goal as a Core Capability that applies to both response and recovery. The THIRA includes the following as a desired outcome for an earthquake threat/hazard:

   > "Assess critical infrastructure impacts, minimize health and safety threats, and achieve basic restoration of priority infrastructure systems and services to support effective response and follow-on recovery operations."

   The corresponding Capability Target for recovery is:

   > "Within 4 months after the incident, in coordination with State Recovery Function

6 (Infrastructure Systems), and other Oregon Resilience Plan partners, initiate a whole community planning process to identify priority community infrastructure for redevelopment to contribute to resiliency, accessibility, and sustainability of the community long-term."

9. *Community Disaster Recovery: A Framework Plan for Multnomah County, Oregon, Multnomah County Emergency Management, 2010*

   A "policy-oriented" approach that identifies recovery activities inclusive of coordination with other entities such as the City. Recognized transportation needs include prioritization of routes for repair, initiating closures and restricting access where appropriate, implementing repairs, and maintenance of open routes.

   Five "potential problems or issues" are identified. Among these are 1) pressure to reopen roads that allow individuals to return to their permanent residences instead of repairing major highways and 2) strong consideration of the prioritization of transit to adequately meet "social justice" needs. The Alternatives Prioritization Tool addresses these concepts by ranking roadways based on their importance to transit riders, bicyclists, pedestrians, motorists, and freight, and ensuring that passenger rail transit facilities receive scores comparable to the most important of roadways.

Transportation Response and Recovery Efforts Underway

Additional planning efforts that are underway and anticipated to begin in the next 18 months (at the time of publication of the Plan) are summarized in Table 1. The Plan is informed by these efforts, and its development can contribute to them and other future efforts.

Stakeholder Interviews

In addition to reviewing adopted plans and planning efforts that are underway, interviews were held with staff from agencies and organizations that would play important roles in providing mobility and information about mobility during the recovery period. In total, twenty-four (24) individuals representing the following organizations were interviewed:

- Go Lloyd (a transportation management association)
- Multnomah County (Emergency Management, Bridge Engineering, and Planning)
- Oregon Department of Transportation (Region 1 and Emergency Management)
- Oregon Health & Sciences University
- Port of Portland (Planning)
- Portland Bureau of Emergency Management
- Portland Bureau of Transportation (Planning and Programming, Maintenance, Bridge Engineering and Public Information and Communications)
- TriMet (Emergency Management, Planning, and Public Information and Outreach)

The interviews were purposely broad in their scope. Questions ranged from the general concept and approach to transportation recovery and whether or how it contrasts with transportation emergency response to the roles each organization plays (or hopes to play) in emergency recovery and specific lessons learned during emergency incidents. In addition, all interviewees were asked to provide input on how they envisioned the Plan benefiting them.

In general, the agencies and organizations have developed guidelines and protocols for emergency response but not for recovery. In some instances, they acknowledged that additional clarification on how their actions during emergency response would differ from those during emergency

recovery is needed. They do see a need for developing a recovery plan and see how it could contribute to their respective objectives. Consistent themes mentioned included:

- Importance of collaboration and communication between agencies, and reliable information provided to the public through a wide variety of means. Two interviewees suggested developing apps that provide a "one-stop shop" about all modes of travel with mapping tools to assist users with real time information.
- Critical evaluation factors include travel time, person trips served, providing safe and convenient pedestrian and bicycle access to transit, and providing access for communities of concern (i.e., persons of color, low-income persons, persons with disabilities, persons with limited English proficiency, children, and older adults).
- Part of recovery must include means for providing electrical power for communications and the ability to work from remote locations, as well as to provide fuel and power for transit vehicles.
- As with activities during emergencies, there should be opportunities to survey conditions in the field, report back to a command center, and have information provided to agencies via the WebEOC service. However, the actions to be taken ought to be considered with regard for prioritizing transit access and pedestrian and bicycle access to transit. In this regard, one interviewee suggested that agency staff sit with each other to understand better how each develops recommended actions.

Some other interesting points mentioned include:

- There is neither a protocol for how to conduct recovery nor a plan for decision-making.
- Two of TriMet's bus garages are not on the ETR map and they will need to be added when the ETRs are updated to ensure unimpeded access for fueling and maintenance purposes.
- Many TriMet operation and maintenance employees do not ride transit because it is not available when they begin or end their work shift.
- A very small percentage of PDX Airport employees (tenants and Port staff) use transit in large part because Airport MAX is currently the only available transit route and many employees commute from East Multnomah County and Washington State, which limits their ability to access MAX. TriMet buses will serve PDX via 82nd Ave (south terminus will be SE Washington Street) between 1 a.m. and 4 a.m. seven days a week starting in the fall 2018.
- Traffic control devices signs were basically non-existent after Hurricane Katrina for many months making it difficult for people to navigate to where they needed to get to. In some cases, the lack of traffic control signs also created a safety issue.

Rather than create a lengthy set of contingency plans for a wide variety of assumed incidents that may or may not occur (and/or may not occur on the facilities considered in those assumptions), it was suggested that both a "one-pager" of what's important for emergency recovery, and a checklist of the components that need to be considered for transportation recovery be prepared.

Table 1: Emergency Response and Recovery Planning Efforts Recently Completed, Currently Underway and Anticipated to Begin in the Next 18 Months (as of July 1, 2018)

Planning Efforts	Summary	Lead Agency	Publication
Metro Debris Management Plan -- Regional Disaster Debris Management Plan (Regional Waste Plan, Appendix B)	Metro is leading a regional effort to update the Regional Disaster Debris Management Plan including enhancing debris forecasting for multiple hazard scenarios, which account for the Emergency Transportation Routes. Staff hosted a tabletop exercise in 2016 to inform planning efforts, and are now convening a quarterly regional work group. This Plan identifies our preparedness strategy for the removal and disposition of debris generated by a natural or human-caused disaster. The Plan specifies goals and objectives, potential mitigation strategies and highlights "potential implementation strategies to ensure that disaster debris efforts are coordinated, efficient, effective, and environmentally sound."	Metro	Spring 2018
City of Portland Disaster Debris Management Annex	This Plan outlines the strategies and actions that will be used by the City of Portland to clear roadways and remove debris in the event that debris from a major disaster or emergency would constrain movements or otherwise threaten human health and safety. The Plan identifies the roles and responsibilities of local, state, federal and private industry partners; and calculates the resources needed for different volumes of debris, describes the contracts needed for private contractors to assist, templates for public service messages, and means of ensuring that FEMA requirements and regulations are obtained including regulatory permits and licenses.	PBEM	Ongoing; last edition January 2014
RDPO: Regional Recovery Framework	The Regional Disaster Preparedness Organization (RDPO) is working with the five counties that make up the Portland Metropolitan Region to develop a framework to guide rebuilding, redevelopment, and recovery efforts following a disaster. The framework looks beyond the disaster event itself, to imagine life in the weeks, months, and years after the disaster; to seize the opportunity to creatively re-design our region to be even stronger and more resilient for the future.	RDPO	Ongoing; next addition anticipated 2019

Mass Shelter Plan	Multnomah County is developing a mass shelter plan for the aftermath of an earthquake that is estimated to displace as many as 90,000+ residents from their homes. Staff are working with property owners to identify shelter facilities; consideration of access routes to these facilities will be important.	Multnomah County	December 2018
Continuity of Operations Plan	All City bureaus, including PBOT, have developed continuity of operations plans (COOP), which define essential functions and establish a plan to continue performance of these functions in the aftermath of a disruption. TriMet is also developing their own COOP. Both efforts can help establish a better sense of agency functions in short and medium-term recovery.	PBOT and TriMet	Ongoing; last edition August 2017
Post-Disaster Facility Assessment, Allocation, and Reporting	This project through the Regional Disaster Preparedness Organization (RDPO) and PBEM will provide a framework for regional emergency managers to identify the best facility sites for various uses after a disaster. The final product will be a web tool that queries all available facility data sources and maps to produce meaningful and manageable sites. Tie in with transportation recovery would come in providing access to key facility sites via ETRs and secondary route priorities (such as Fire Management Area Emergency Routes).	RDPO/PBEM	May 2018
Regional Fuel Management Tabletop Exercise	Working with the Oregon Department of Energy (ODOE), RDPO is organizing a tabletop exercise to test emergency fuel management protocols between State and County staff in the region, following an earthquake. Requires careful analysis of lifeline routes and ETRs adjacent to fuel storage facilities for bulk delivery and distribution, among many other factors.	RDPO/ODOE	January 2018
Time-To-Recovery Framework	Working with the City Asset Managers Group, PBEM is developing a time-to-recovery framework for the City of Portland. Building on the work of the Oregon Resilience Plan, this will help bureaus assess interdependencies for critical infrastructure and set citywide time-to-recovery goals.	PBEM/City of Portland	Late 2018

Regional Utility Coordination Update	Working with NW Natural, Portland General Electric and Pacific Power, the region is updating a decade-old coordination plan to share information during an emergency or major incident; this includes setting criteria for activations and protocols for information sharing. This is essential for transportation recovery because restoration of utilities is needed to bring on traffic controls, traffic monitoring systems, lighting and advisory signs, and other equipment (including vehicle fleets) that is electrically powered.	Utility Providers/ RDPO	2018-2019
Oregon Resilience Plan	The Oregon Resilience Plan outlines the expected impacts to life and livelihoods from a Cascadia subduction zone earthquake and tsunami, and recommends "risk reduction measures and pre-disaster planning" to allow Oregon communities to recover more quickly and with less continuing vulnerability following such an incident. Regarding the resilience of the state's transportation system, an assessment was made of the seismic integrity of Oregon's bridges and highways, rail, airports, water ports, and public transit systems, and Columbia and Willamette River navigation channels, and identified the investments needed to restore and maintain transportation lifelines.	Oregon Seismic Safety Policy Advisory Commission	Ongoing; last edition February 2013
Oregon Recovery Plan	The Oregon Recovery Plan, also known as the Oregon Emergency Management Plan, is the State's plan for recovery activities in the aftermath of an emergency (referred to as "natural, technological, or human-caused disasters"). It established a state recovery organization and a chain of command to support recovery activities, assigns roles and responsibilities to state agencies, identifies points of coordination with governmental and non-governmental organizations, and is implemented at the direction of the Governor or other official authorized by state law. While the Oregon Recovery Plan is in line with the National Disaster Recovery Framework published by FEMA, it is not direct or authorize the activities of local jurisdictions or federal and volunteer agencies. It does, however, provide a reference for their actions, plans, and emergency procedures. Transportation is	OR Office of Emergency Management	Ongoing; last edition December 2014

	addressed under State Recovery 6: Infrastructure Systems		
Metro Regional Transportation Plan	Metro is preparing the 2018 update to Regional Transportation Plan, which will contain a section on emergency services preparedness.	Metro	2018
Portland Transportation System Plan	PBOT is updating the City's Emergency Transportation Routes, which includes Major Emergency Response Streets (intended to serve primarily the longer, most direct legs of emergency response trips); Secondary Emergency Response Streets (intended to provide alternatives to Major Emergency Response Streets in cases when traffic congestion, construction, or other events occur that may cause undue delays in response times); and Minor Emergency Response Streets (intended to serve primarily the shorter legs of emergency response trips).	Metro	2018

2. HAZARD INCIDENTS

The 2016 Mitigation Action Plan (MAP) is the authoritative source for information on the relevant background, profile, extent, and severity for the select incidents upon which the approach and actions of the Plan were developed. Of the seven natural hazards types identified in the MAP, earthquakes, floods, and landslides were determined to be those that would have longer lasting recovery periods and would be more relevant to the needs of the Plan. In addition, the Transportation Recovery Plan includes a fourth hazard – homeland security incidents – which in some instances could also require an extensive period of recovery.

Some of the natural hazard incidents could trigger other natural hazard incidents. For example, an earthquake or flood incident could result in landslides, and any of these four incidents could have very localized impacts or have citywide and even regional effects. Depending on the magnitude of any of these four incidents, the time needed for response and recovery will be specific to the actual incident.

For the purposes of the Plan, it is essential to understand that while each of these four incidents would have dramatically different impacts on infrastructure and services and the time needed to restore them, our actions during the recovery period would have many similarities regardless of the incident.

A. MODERATE/HIGH-INTENSITY EARTHQUAKE

1. Background – The Portland area has experienced numerous earthquakes in the past, ranging in magnitude from 4.5 to 9.2. Since historic records have been kept on earthquakes in the Pacific Northwest (i.e., about 300 years), as many as seven earthquakes occurred in Portland ranging from a magnitude 4.5 to 5.5, and as many as ten earthquakes were felt in Portland (ranging in magnitude from 5.0 to the 9.2 magnitude Prince William Sound quake in 1964). In addition, the geologic record has identified as many as eight Cascadia subduction zone earthquakes that were felt in Portland ranging from magnitude 8.0-9.0 from the year 1400 BC to the last one in the year 1700. Moreover, geologic evidence indicates that a magnitude 6.5 earthquake may have occurred in the Portland Hills fault zone in the last 10,000 years. The most recent large earthquake felt in Portland was the 1993 Scotts Mills quake – with its epicenter located about 40 miles south of Portland – registering a magnitude 5.6 and was felt by Portland residents, caused only minor damage but did require deployment of damage assessment teams to assess bridges and other infrastructure.

   The overwhelming majority of Portland's buildings were built prior to the adoption of the 1993 building code seismic requirements and many would not survive a major seismic incident. According to the MAP, damage from a magnitude 9.0 Cascadia earthquake would displace nearly 6,000 Portland households. A 6.5 magnitude Portland Hills incident would displace over 25,000 Portland households.

2. Extent/Severity – The Oregon Resilience Plan estimates that the recovery period to restore infrastructure damaged in a moderate to severe earthquake could take weeks to months to years. For example, damage to bridges, tunnels, retaining walls, elevated ramps, poles, signs, etc., could be irreparably damaged or require years to repair. Debris clearance may also delay repairs and accessibility to several routes and facilities. In addition, traffic signals, advisory signage,

street lighting, other traffic controls, battery-powered electric vehicle fleets, and other equipment and resources that rely on electrical power could be disrupted for one to three months or longer.

B. LANDSLIDES

1. Background – Both human actions (such as grading and excavation) and natural processes (such as excessive rainfall and earthquakes) can cause landslides. Hundreds of landslides have occurred in Portland in the past 20 years and the city can expect many more in the future. Landslides are most likely on steep slopes when the ground is saturated from rainfall or poor drainage. More than 89,000 people in Portland live in landslide hazard areas and over $20 billion worth of buildings and contents are located within them.[2] Landslides will be prevalent in an earthquake incident as well but represent a separate threat from flooding. Due to heavy rain and ground saturation, the city experienced 61 landslides during the winter and spring of 2017, which were estimated to result in approximately $7 million in damage.[3]

2. Extent/Severity – Damage from landslides is typically localized and is often repaired in a matter of days. However, the debris and runout from landslides can significantly affect transportation corridors and services. The winter 2017 landslide across West Burnside Street forced its closure for over nine days. The Oso, Washington landslide in 2014 resulted in 43 fatalities and destroyed 49 homes, and forced the closure of a critical north/south roadway, which stranded the area's residents for several days. When landslides are the result of heavy rains or seismic incidents, they can affect multiple areas and take longer to repair, as larger numbers of roadways need to be repaired.

C. FLOOD

1. Background – Being at the confluence of two major rivers and fed by the Tualatin and Sandy Rivers, several streams, and snow melt from mountains to both the east and the west, Portland experiences some measure of flooding every year and during all seasons of the year. Johnson Creek in the southeastern section of the city experiences the most frequent number of flood incidents, and other urban areas are often overwhelmed by flooding from blocked storm drains and runoff from impervious surfaces. According to the MAP, "[T]here are 2,925 structures in the 1-percent-annual-chance flood hazard area, and over 9,500 people who live in these areas. Only about half of the people who live in the 1-percent-annual-chance flood hazard area have flood insurance."

2. Extent/Severity – Floods can be due to heavy periods of rainfall or accelerated snowmelt. The winter 1996 flood was a mixture of both excessive rainfall and snowmelt from a sudden warm jet stream that overwhelmed rivers and streams. City staff and citizens placed 40,000 sandbags and erected 600 plywood boards along the banks of the Willamette River in Downtown Portland, which mitigated much of

[2] *Estimating Losses from Landslides in Oregon*, by William J. Burns, Nancy C. Calhoun, Jon J. Franczyk, Kassandra O. Lindsey, and Lina Ma, 3rd North American Symposium on Landslides, Roanoke, Va, June 4-June 8, 2017 http://www.oregongeology.org/pubs/ims/IMS-57/NASL-2017-Burns.pdf

[3] Landslide Prevention and Response, Climate action in Portland: Updates from City-PSU partnership, Laura Gleim, Institute for Sustainable Solutions, posted May 30, 2017, https://www.pdx.edu/news/climate-action-portland-updates-city-psu-partnership

the expected damage. Still, Multnomah County was declared a federal disaster area and the cleanup effort took months.

Similar rain and snowmelt conditions resulted in the 1948 floods that destroyed dikes in the Columbia River basin, which claimed 15 lives and completely obliterated the 18,500-resident community of Vanport. In 2007, severe storms, winds, mudslides, landslides, and flooding shut down roads and highways (including I-5), and 73,000 Oregon residents were without power.

D. HOMELAND SECURITY INCIDENT

1. Background – – In contrast to the natural incidents described above, homeland security incidents are those hazards perpetrated by individuals and groups against governments, cultural institutions, businesses, educational systems, recreational and touristed areas, monuments and structures, as well as against an individual's race, religion, ethnic background, economic class, job type, and other characteristics. They are often experienced as violent acts resulting in death, injury, and property damage. In other instances, such as disabling computer systems, they are intended to disrupt lives by instilling fear, confusion, and even wide-scale economic loss. Further, terrorist acts can be directed at fresh water supplies, power grids, petroleum storage tanks and pipelines, and agricultural products. A frequent secondary effect of terrorist acts is the degradation of the environment.

2. Extent/Severity - – In 2015, the Federal Bureau of Investigation in Portland reported that it had 70 active terrorism investigations in Oregon. The impacts of these incidents can vary greatly with respect to both direct impacts (loss of life, injury, and property damage) and indirect impacts (the fear created by them that results in reduced travel, economic activity, and social interaction).

   Homeland security incidents frequently target places where large numbers of people congregate as well as where individuals are vulnerable – e.g., while using public transportation systems – and can result in mass casualties. Many homeland security acts, such as those directed at individuals or incidents, may have localized and short-term effects, but others may be intended to have a wide-scale impact affecting our electrical grids, communications lines, and transportation systems for weeks, months or years to restore.

3. TRAVEL ROUTES AND EMPLOYMENT CENTERS

To ensure the actions contained in the Plan will be effective in restoring mobility for people and freight, the ETRs and five major employment centers within the city were assessed. The centers were chosen as they include significant numbers of employees and have civic, health care, and other vital services located within their boundaries. Annotated descriptions of each are provided in this chapter and should be consulted as recovery actions are advanced.

Approximately 350,000 individuals commute to workplaces in the City of Portland every weekday: 72 percent of whom travel by automobile, 12 percent by transit, and 12 percent by bicycle or on foot.

Approximately 350,000 individuals commute to workplaces in the city every weekday: 72 percent of whom travel by automobile, 12 percent by transit, and 12 percent by bicycle or on foot. In addition, there is an untold number of individuals traveling to schools, personal appointments, shopping, recreational areas, and other places within the city. These trips occur over the course of the day with concentrations during peak commute periods. The majority of these trips originate in and are destined for the city's five major employment centers from all directions.

Fortunately, there are a wide array of transportation modes available in Portland. The city accommodates a much higher level of transit service and bicycle lane mileage than its peer cities, and trip making by non-auto modes is as high as 35 percent in some areas of the city. From a recovery standpoint the availability of these non-auto options will be essential. Should a roadway be closed due to a natural or human-caused incident, most travelers will have the option of using the city's extensive and connected transit, bicycle, and pedestrian networks.

There are also challenges that need to be considered. The city's steep geography on the west side results in a limited number of corridors, and the Willamette River bisection of the city makes it highly dependent on bridges that may or may not be available after an incident, depending on the severity and extent.

A. EMERGENCY TRANSPORTATION ROUTES

ETRs have been established through a regional agreement between the five counties of the Portland Metropolitan Region. These ETRs were adopted by the Portland City Council in 2006 and these routes are planned to be the first to be cleared of debris after an incident. They serve as the principal routes for emergency service vehicles and construction equipment. In addition, the ETRs connect the city with the remainder of Multnomah County and the larger region. The ETRs are presented along with the TriMet MAX lines and the City's priority bikeway network in Figures 3.1 and 3.2, respectively.

These routes provide for system-wide mobility and are made up of collector and arterial streets that have ample capacity to handle large volumes of traffic. Intentionally, many of the ETRs also accommodate transit routes, and are Enhanced Transit Corridors, and, in some cases, bicycle lanes. In addition, some are designated freight routes and include interconnected pedestrian networks. After an incident and all emergency activities are completed, the ETRs can serve as the primary recovery routes.

The ETR map needs to be updated. Since its creation in 2006, there have been a number of new and/or improved facilities such as the new Sellwood Bridge or the Tilikum Crossing. In addition, direct access to TriMet's Merlo and Center Street bus garages should be added to ensure the maximum number of buses are available to support recovery efforts without much interference. The Merlo facility is included even though it is outside the city because its operation directly affects bus service to, from, and within city limits. Consideration should also be given to an ETR with direct access to the OHSU campus.

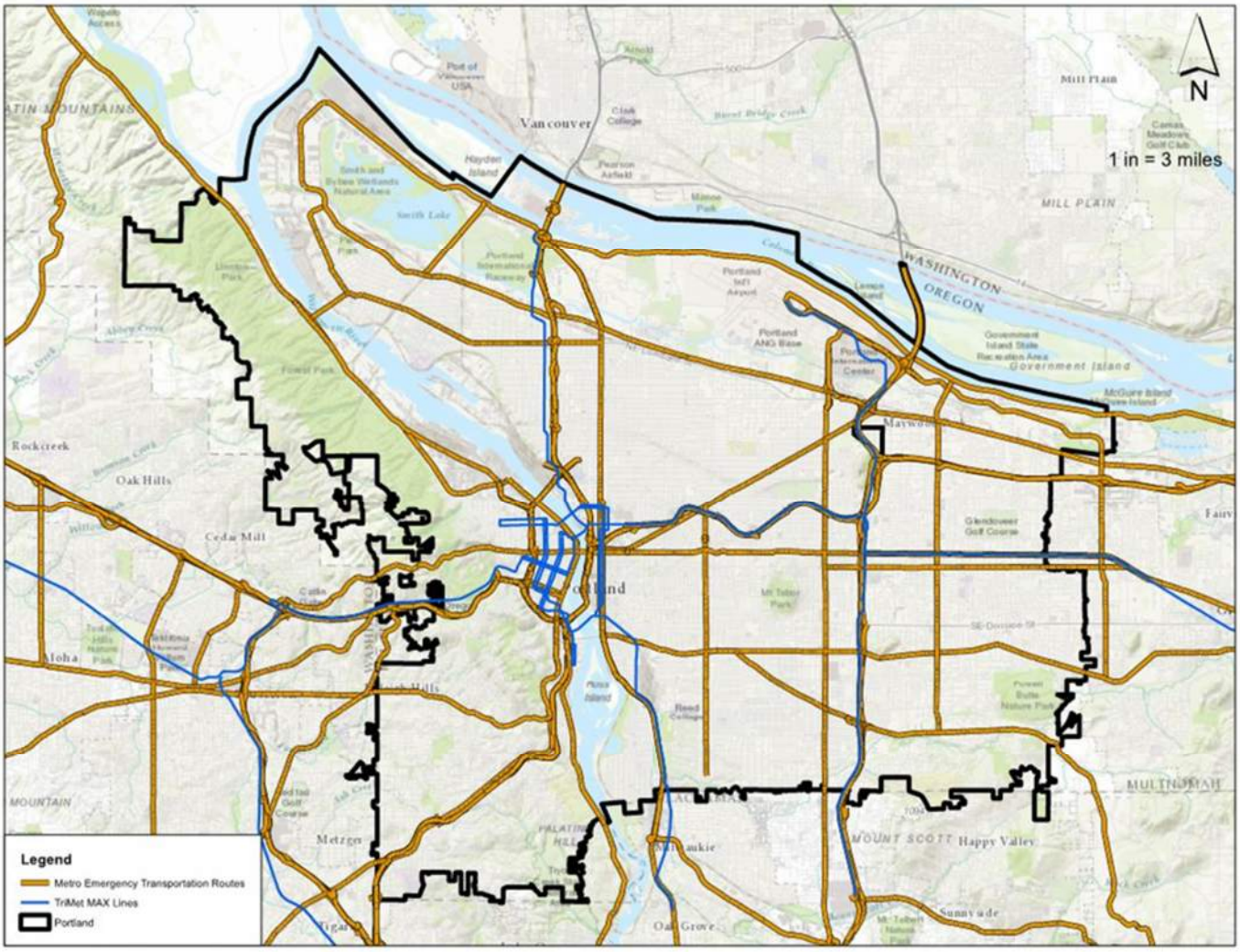

Figure 3.1 ETRs and TriMet MAX Lines

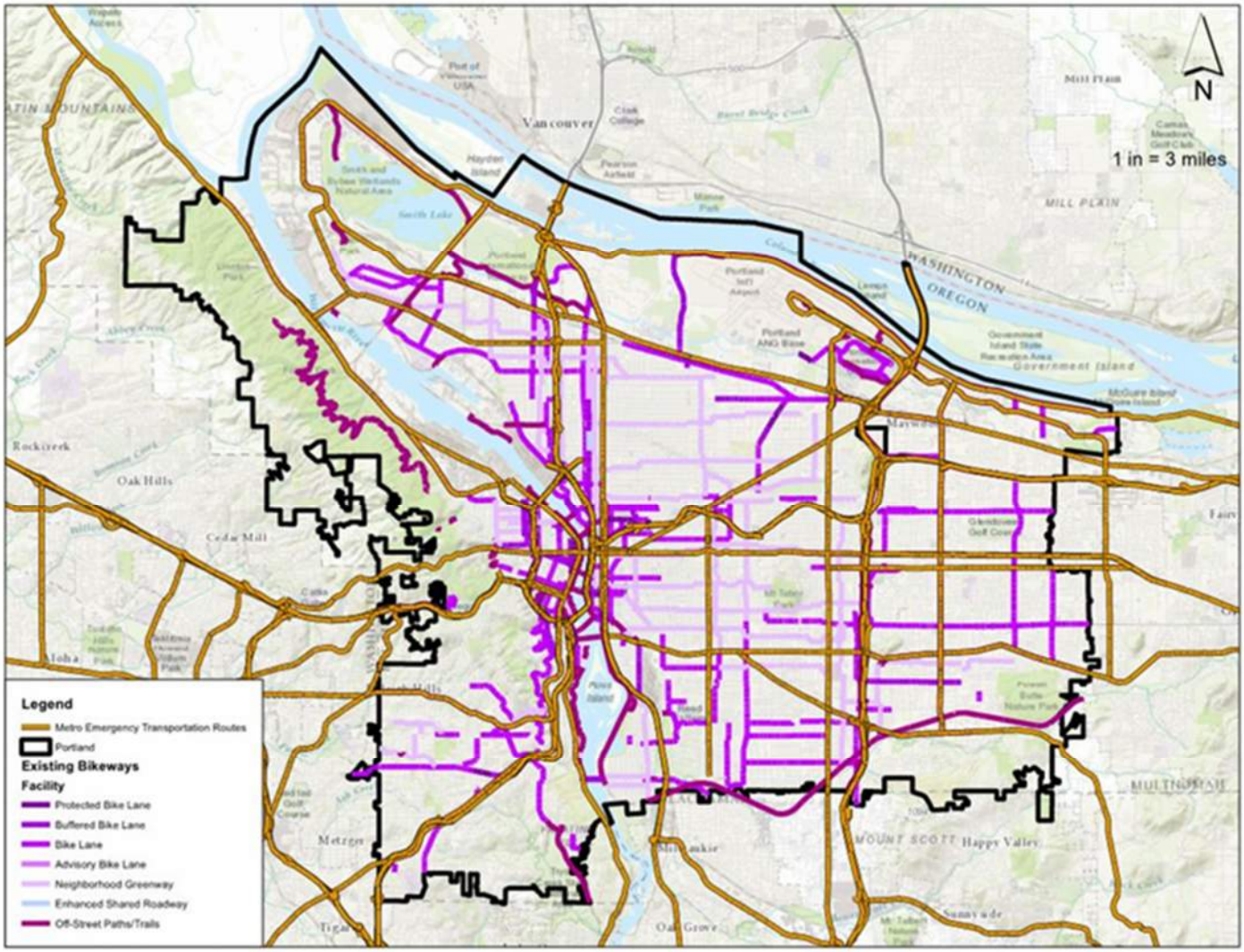

Figure 3.2 ETRs and City of Portland Priority Bicycle Network

B. EMPLOYMENT CENTERS

Over the course of the development of the Plan, stakeholders often characterized issues and opportunities as they related to the city's major destinations. Four current employment centers and one future center were considered focal points, representing many of the commercial, residential, civic, and other basic community activities that are central to the economic and social well-being of the City of Portland, as well as Multnomah County and the Portland Metropolitan Region. A description of these centers, their physical and socioeconomic characteristics, and their relationship to the ETRs is discussed below.

1. Downtown Portland – Downtown Portland is the central business district of the city and a major economic engine regionally and statewide

   a. Boundaries – Downtown Portland encompasses the area south of Burnside Street to SW Market Street from the Willamette River to I-405. Nearly 100,000 workers are located within these boundaries as are over 30,000 residents (see Figure 3.3).

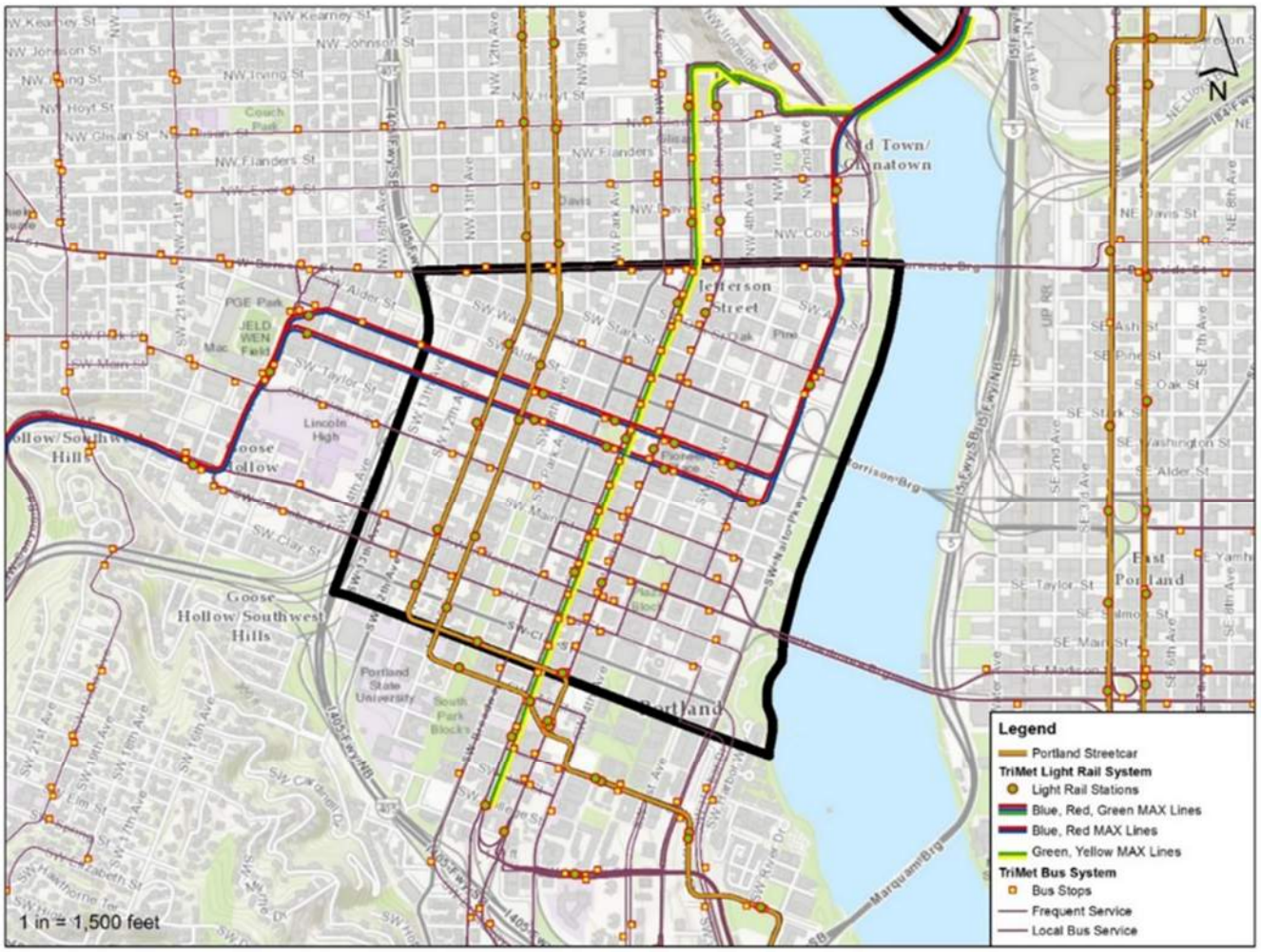

Figure 3.3 Downtown Portland

b. Major employers/key economic sectors and clusters – The Downtown Portland area accommodates most major economic sectors: professional/technical services to retail, finance/insurance/real estate, hospitality/tourism, legal services, education, advertising/ public relations, and telecommunications. Some of Downtown Portland's largest employers include Schnitzer Steel, Portland General Electric, Northwest Natural Gas, and the City of Portland.

c. Emergency/health facilities – The Portland Police Bureau's Central Precinct is located downtown. Its front desk is open 24 hours and jail/central booking is located there. Portland Fire & Rescue (PF&R) Station 01 serves as the command post for PF&R. Just north and west of Downtown Portland is the Legacy Good Samaritan Hospital, a full service major hospital with emergency room facilities, and a large number of neighboring medical clinics and physicians' offices.

d. Governmental functions – The City of Portland has facilities located throughout the Downtown area centered around City Hall and the Portland Building. Nearby are TriMet's administrative headquarters and a few blocks north of Burnside Street is the Oregon Department of Transportation Region 1 office. The federal government has a large complex in Downtown, and both Multnomah County and other State of Oregon agencies have multiple social services and administrative/regulatory units in Downtown

Portland. Finally, the U.S. District Court and the Multnomah County Courthouse are located here as well.

e. Major transit routes/highways/bicycle facilities – Downtown Portland is where: one interstate highway and several primary arterial and collector streets meet; nearly all of TriMet's buses and all MAX routes converge (many of them on the Transit Mall) as do all of the Portland Streetcar routes; CTRAN express service from Downtown to Clark County; several bike boulevards, bicycle lanes, and two greenways (Waterfront Park and the Park Blocks); and a fully integrated pedestrian network provide short- and long- distance connections.

f. ETRs – Downtown Portland is host to two north-south ETRs (I-405 and Naito Parkway) and one east-west ETR (Burnside Street), each of which provide access to the intercity transportation network, as well as serve some of the city's densest neighborhoods.

2. Lloyd District – After Downtown, the Lloyd District hosts the largest number of employees in the Central City and is served by a comprehensive multimodal transportation network.

a. Boundaries – The Lloyd District is bounded by NE Hancock Street and I-84 on the north and south, and the Willamette River and NE 12th Street/NE 15th Street on the west and east. The neighborhood is home to approximately 25,000 workers and 3,500 residents (see Figure 3.4).

b. Major employers/key economic sectors and clusters – The Lloyd District accommodates major employers including PacifiCorp and the Bonneville Power Administration, retailers at the Lloyd Center mall, the Oregon Convention Center (1.0 million square feet), Moda Center (19,800 seats), Memorial Coliseum (11,500 seats), and 2.5 million square feet of office space.

c. Emergency/health facilities – Just to the north of the Lloyd District is Legacy Emanuel Hospital, a full service major hospital with emergency room facilities with a large number of neighboring medical clinics and physicians' offices.

d. Governmental functions – The Metro Regional Center is located in the Lloyd District as are multiple federal facilities.

e. Major transit routes/highways/bicycle facilities – In addition to highway access provided by I-5, I-84, NE Grand Avenue, Martin Luther King, Jr, Boulevard, and NE Broadway, the Rose Quarter Transit Center accommodates four MAX routes. The Portland Streetcar and nine bus routes traverse Lloyd. A fully interconnected pedestrian network and several streets accommodate protected and striped bike lanes as well as shared bike routes.

f. ETRs –The Lloyd District accommodates three ETRs – I-5, I-84 and the Martin Luther King, Jr Blvd/ NE Grand Avenue couplet (OR 99E). Access to the freeway ETRs is provided via Broadway, NE Williams Avenue and NE Grand Avenue, and as the Martin Luther King, Jr/NE Grand Avenue couplet is part of the Lloyd District street grid, it can be accessed from multiple streets.

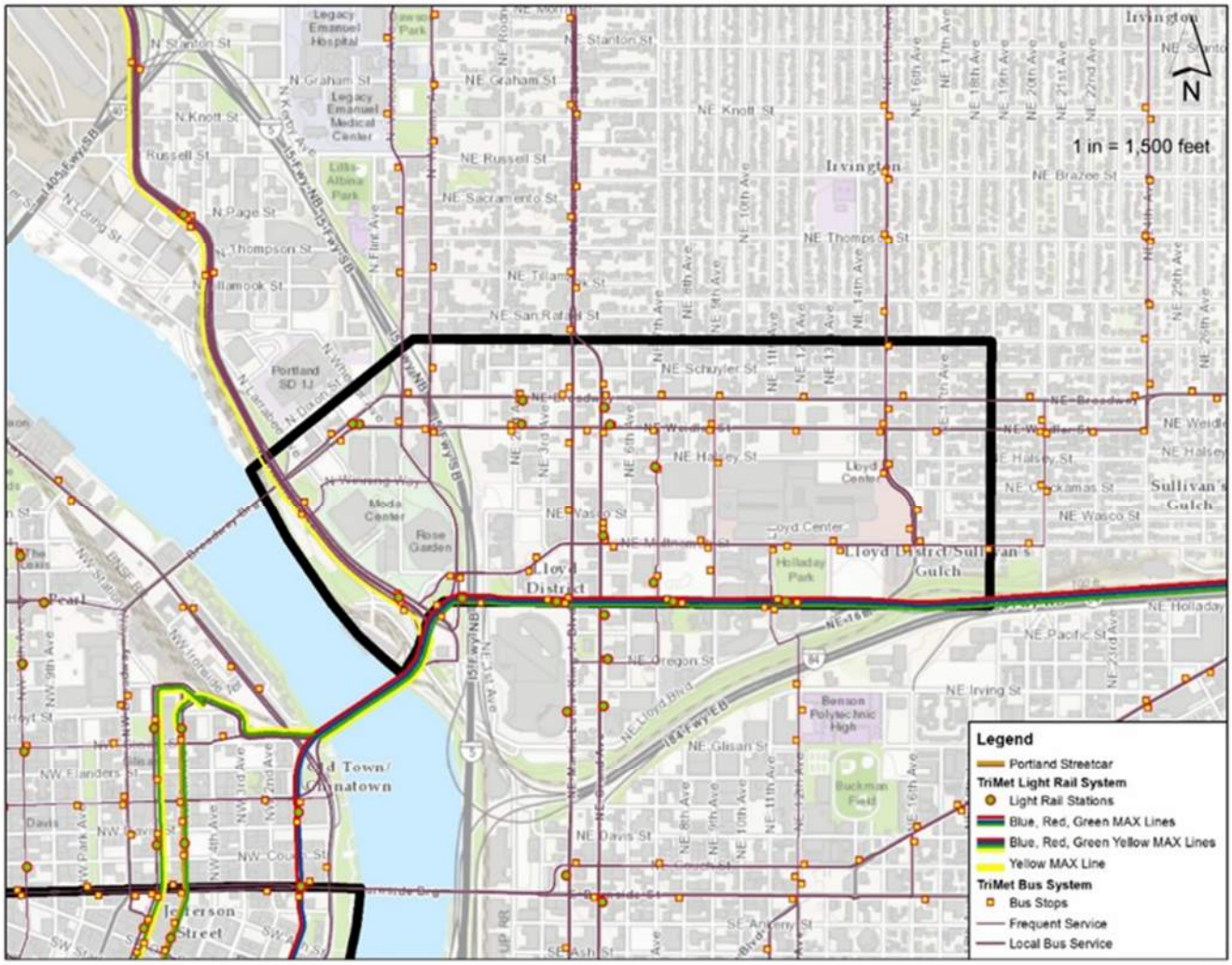

Figure 3.4 Lloyd District

3. Oregon Health & Sciences University (OHSU) – OHSU is the fourth largest private sector employer in Oregon (largest in the City of Portland), and it accommodates over one million annual patient visits.

a. Boundaries – OHSU has facilities in southeast inner Portland and Washington County, but its primary concentration of facilities is on both Marquam Hill and its facilities on the South Waterfront, which employ approximately 16,000 workers (see Figure 3.5).

b. Major employers/key economic sectors and clusters – Major employers are OHSU, Shriner's Hospital, the Veteran's Administration, and the physicians' offices contained within them. The cluster includes health care facilities, hospitals, and medical academic and research facilities.

c. Emergency/health facilities – Emergency facilities at OHSU; non-emergency medical care is provided at OHSU facilities, Shriner's Hospital, and the Veterans Affairs Medical Center.

d. Governmental functions – Veteran's Administration services.

e. Major transit routes/highways/bicycle facilities – Marquam Hill facilities are accessed by SW Terwilliger Boulevard and SW Sam Jackson Road, as well as by the Aerial Tram, one all-day bus route, and five peak period

express bus routes. OHSU's South Waterfront facilities are served by SW Moody Avenue and the Tilikum Crossing, MAX Orange Line, Portland Streetcar, the Aerial Tram, Gibbs Street Pedestrian and Bicycle Bridge, and two bus routes.

f. ETRs – There are no ETRs directly serving the OHSU District, though I-5 and SW Barbur Boulevard (OR 99W), both of which are ETRs, are near the campus.

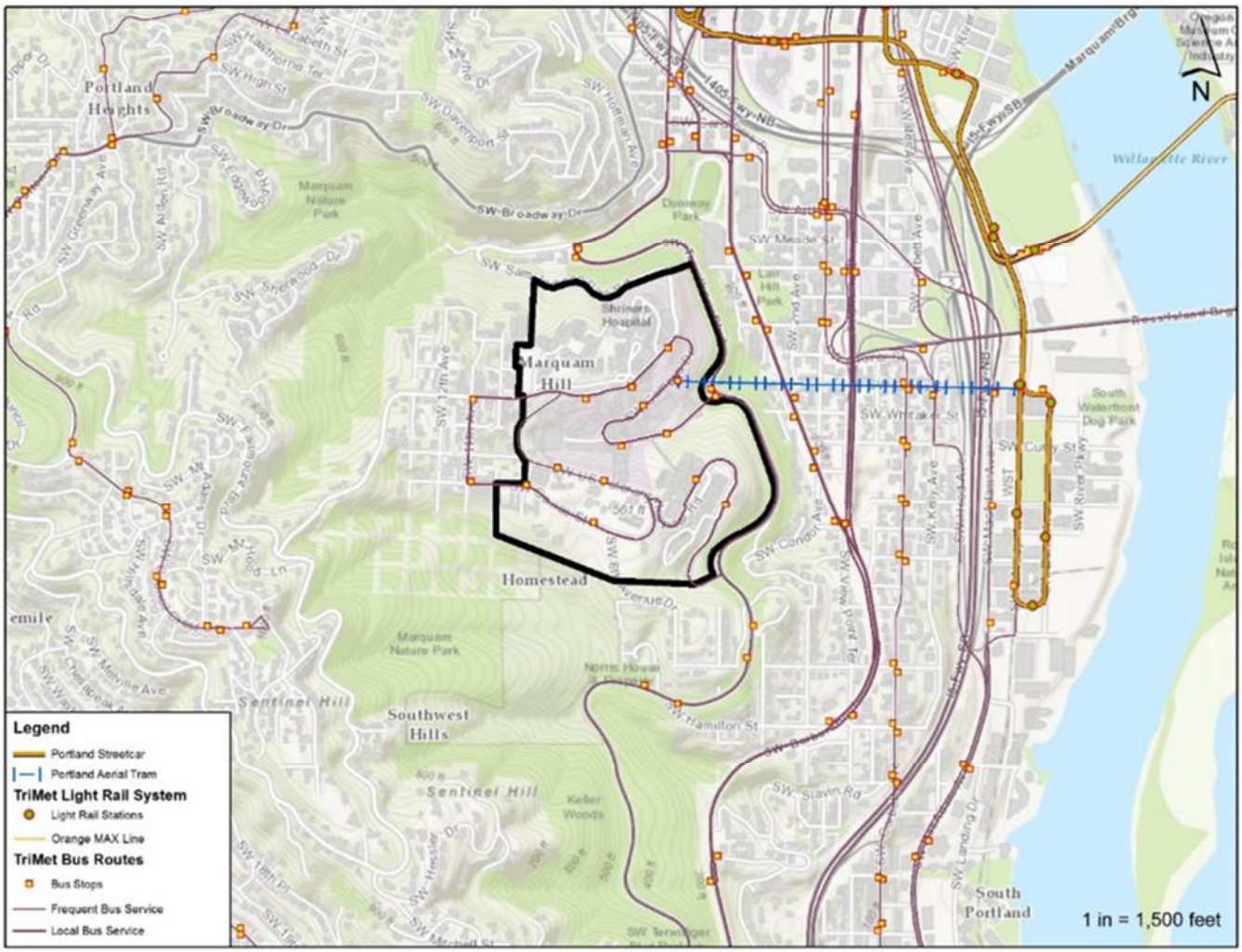

Figure 3.5. OHSU District

4. Port of Portland –Within the City of Portland's boundary, the Port of Portland is comprised of four marine terminals (T-2, T-4, T-5, and T-6) and the Portland International Airport (PDX), as well as the Cascade Station, Portland Industrial Center, Rivergate Industrial District, and Swan Island Industrial Park properties. The activities undertaken at the Port of Portland are important to the economic functions of the City and larger region with respect to storage, processing, and transport of bulk commodities and large fabricated goods.

a. Boundaries – From the confluence of the Columbia and Willamette Rivers on the west to I-205 on the east, the Oregon-Washington state line on the north, and NE Lombard Street on the south (see Figure 3.6). It is important to note that the portion adjacent to the Columbia River is at high risk for liquefaction due to certain hazard incidents.

*b. Major employers/key economic sectors and cluster*s – Employers include those industries that rely on bulk raw materials and intermediate inputs for production of typically larger, heavy items that are best transported by water or rail. This includes metal and steel fabricators, recyclers, and manufacturers (e.g., IRC Aluminum & Stainless, Lampros Steel, Northwest Pipe, Far West Recycling, etc.). In addition, logistics firms and intermodal shippers, receivers, and carriers are vital components of the economy that, like the industries described above, rely on the locational advantages of the Port and its transport facilities and properties.

c. Major transit routes/highways/bicycle facilities – The Port of Portland is crucial to recovery for both passengers and freight. The rivers can serve as marine highways capable of transporting not only goods but also people in the event that surface transportation facilities are not functional, provided they are navigable and not compromised by the hazard incident. PDX and its air cargo facilities can handle increased traffic of needed supplies and the influx of emergency personnel and craftsman from outside the region during response and recovery. Major highways include I-5, I-84, I-205, NE Portland Highway, NE Columbia Boulevard, Marine Drive, NE 82nd Avenue, and NE Martin Luther King, Jr. Boulevard. The MAX Red and Yellow lines serve this area, including the Parkrose/Sumner Transit Center and North Lombard Transit Center.

d. ETRs – All Port properties are well served by ETRs including Marine Drive, Columbia Boulevard, Lombard Street, I-5, I-205, OR 99E (i.e., Martin Luther King, Jr Boulevard), NE 82nd Avenue, and Airport Way. Except for OR 99E and portions of Columbia Boulevard and Lombard Street, these roadways can all accommodate oversize vehicles and have direct interchange connections.

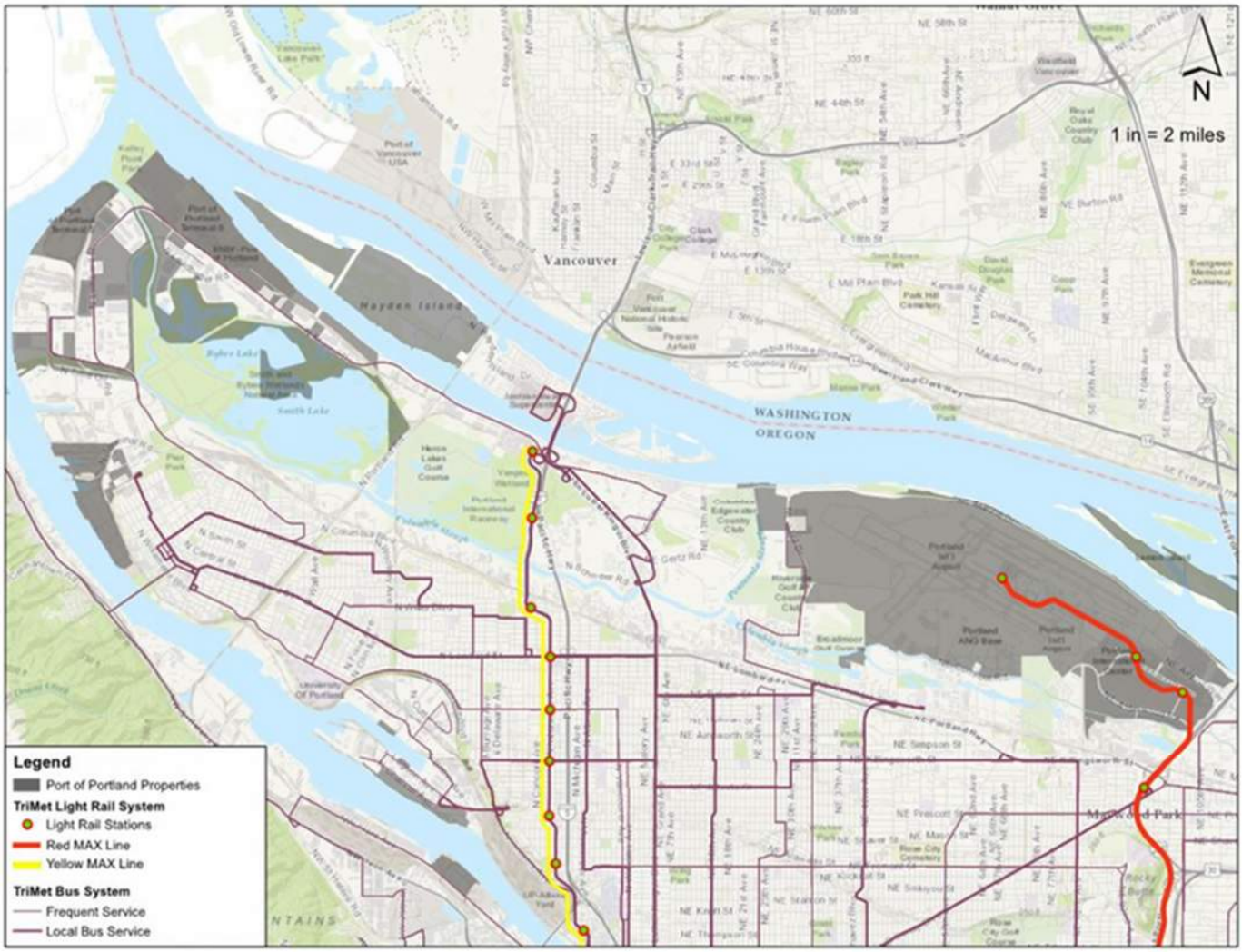

Figure 3.6 Port of Portland

5. Gateway District – The Gateway District is just south of PDX and adjacent to I-205. It is a significant hub for the region's transportation system and is a designated future growth area ("Gateway Regional Center") in the 2035 Portland Comprehensive Plan as well as in Metro's RTP.

a. Boundaries – From just north of NE Weidler Street south to SE Market Street, and I-205/SE/NE 102nd Street to an easterly boundary ranging from SE/NE 103rd Street to NE 114th Street (see figure 3.7).

b. Major employers/key economic sectors and clusters – Mall 205, Fred Meyer, Win Co Foods, Kohls, Oregon Clinic, Portland Adventist Academy, Adventist Medical Center.

c. Emergency/health facilities – Adventist Medical Center is an in-patient and out-patient medical center with emergency room facilities.

d. Governmental functions – Multnomah County Administration (Social Services), Multnomah County Tax Reassessment, The Gateway Center (Portland social services), and the U.S. Post Office.

e. Major transit routes/highways/bicycle facilities – Major roadways include I-84, I-205, NE Halsey Street, NE 102nd Avenue. The Gateway Transit Center accommodates MAX Red Line, MAX Blue Line, and MAX Green Line routes and seven bus routes. The sidewalk system is nearly complete and interconnected

and there is a network of bike lanes and shared roadways.

f. ETRs – The Gateway District hosts four ETRs including I-205 and I-84, and East Burnside Street and SE Stark Street. District streets have interchanges with I-205 and I-84.

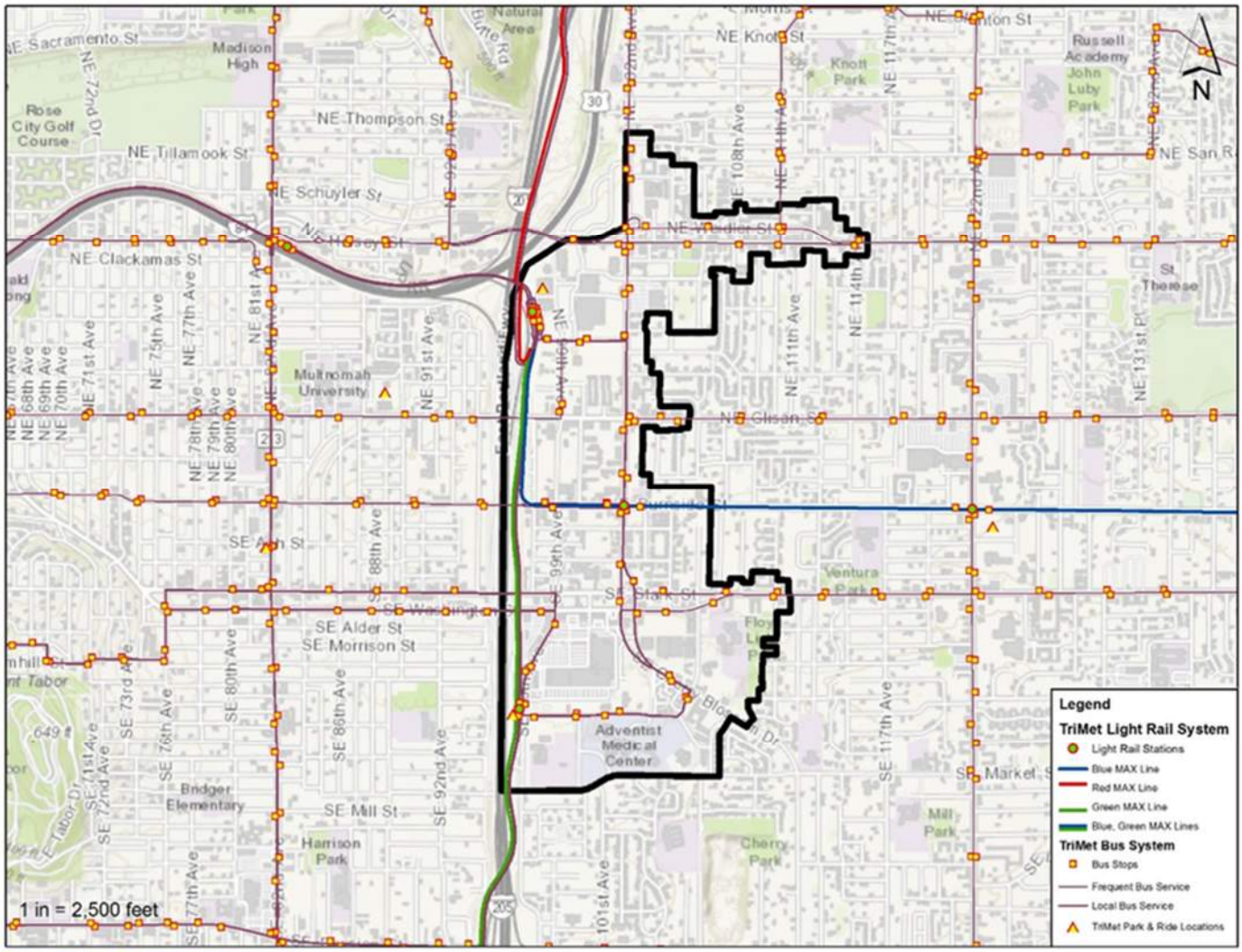

Figure 3.7 Gateway District

4. PORTLAND EMERGENCY RECOVERY ALTERNATIVES PRIORITIZATION TOOL (PDX APT)

As part of the Plan, the Portland Alternatives Prioritization Tool (PDX APT) was developed. The PDX APT is an easy-to-use, straightforward application that the TRWG can utilize to create an initial ranking of transportation projects for further analysis and discussion prior to funding and implementation. The PDX APT will provide a prioritized list of over 1,000 segments that encompass all major roadways and passenger rail lines (TriMet MAX and Portland Streetcar) in the City of Portland based on the methodology discussed below. During response, the TRWG will access the PDX APT and enter the status of the roadways' and passenger rail lines' ability to serve the traveling public by segment (fully open, partially open, closed) along with a generalized cost for those facilities that require repair prior to being placed back in service. The prioritized list that the PDX APT provides will serve as a primary resource for many of the actions included in "Element #2: Infrastructure Assessment/Repairs" of the recommendations (see Chapter 5).

To be clear, the PDX APT is a decision support tool for use during recovery. It is not intended to replace existing capital project selection processes. Figure 4.1 presents the major steps and the associated sequencing used to develop the PDX APT.

The technical exercise of creating a tool such as the PDX APT is rather straightforward, but its usefulness during recovery planning is dependent on understanding the environment in which it will be employed, the perspective of those that will be using it, and a well-founded analytical framework. The following represent the key considerations that guided the development of the PDX APT:

1. Adaptive

   The MAP provides a large amount of information on the exposure and vulnerability of people, property, critical facilities and infrastructure (including transportation), and the environment for numerous hazards including (but not limited to) multiple earthquake scenarios (Cascadia Zone and Portland Hills), floods, landslides, severe weather, and drought. The PDX APT needs to be applicable to each of these and the varying levels of severity that can accompany each hazard.

   This requires that the PDX APT be able to account for an extremely large number of potential cumulative impacts to transportation infrastructure, operations, and services. Beyond the impacts of the incidents themselves, there will be restoration of transportation infrastructure during the response phase that needs to be accounted for and considered during recovery. It is also important to remember that the PDX APT is neither predictive nor overly prescriptive. With respect to the latter, the PDX APT is dynamic in that it allows emphasis on various elements to be changed.

2. Performance-Based

   The PDX APT is intended to rank potential actions based on their impact in attaining the greatest benefit to the traveling public. In this sense, the PDX APT is similar to any capital (or service or operations) programming process: it should assess and arrange the inputted transportation improvements in order of their contribution to the safe, efficient, reliable movement of people of freight. The scoring methodology is based on calculating a 100-

Figure 4.1 PDX APT Workflow

point score across three major categories comprised of multiple criteria as follows:

a. *Usage* – Maximum of 50 total points for rail and 50 total points for roadways based on the level of usage by users and the role of the facility in emergency management activities.

MAX Light Rail Service or Portland Street Car

i. Ridership by line (maximum of 50 points)

Roadway

i. PBOT Traffic Classification (maximum of 9 points)
ii. PBOT Transit Classification (maximum of 9 points)
iii. PBOT Bikeway Classification (maximum of 9 points)
iv. PBOT Pedestrian Classification (maximum of 9 points)
v. PBOT Freight Classification (maximum of 9 points)
vi. PBOT Emergency Response Route (maximum of 5 points)

b. *Access* – Maximum of 35 total points based on degree to which priority areas and facilities are served.

i. Centers and Corridors (maximum of 7 points)
ii. PBEM Tier I Critical Facilities (maximum of 5 points)
iii. Hospitals (maximum of 5 points)
iv. Fire Stations (maximum of 5 points)
v. Police Stations (maximum of 5 points)
vi. Large Employers (maximum of 4 points)
vii. BEECN Location (maximum of 4 points)

c. *Equity* – Maximum of 15 total points based on the degree to which communities of concern are positively impacted.

   i. Persons of Color Served (maximum of 3 points)

   ii. Low-Income Persons Served (maximum of 3 points)

   iii. Persons with Disabilities Served (maximum of 3 points)

   iv. Persons with Poor Vehicle Access Served (maximum of 3 points)

   v. Persons with Limited English Proficiency Served (maximum of 3 points)

3. User-Friendly

   There are five phases of emergency management. The one that immediately precedes recovery is response. The primary goal during response is to reduce loss of life, injuries, and property damage resulting from the direct effects of the incident. This requires that the PDX APT be provided in a software application that is familiar to the vast majority of potential users so that they can feel comfortable manipulating and modifying the tool as needed.

   MS Excel is one of the most widely used software applications and the most popular spreadsheet program by both Windows and Mac users. Professionals across a wide range of occupations use MS Excel for both basic and advanced tasks related to manipulating and sorting data, inventorying and tracking assets and services, and general project management and accounting. For this reason, MS Excel was chosen as the preferred software application for the PDX APT.

5. Recommended Actions

The purpose of the recommended actions contained herein is to serve as the "playbook" for members of the TRWG as they strive to restore the city's transportation system to its full function.

The actions combine operating procedures and proactive activities that that are intended to enhance the ability to recover and restore infrastructure and services.

A. Transportation Recovery Working Group Roles & Responsibilities

Perhaps the most critical component of the Plan is the management and coordination of all government (local, state, federal and special district) leadership, staff, and resources to be working collaboratively toward the same goals. Such collaboration allows for the most expedient and managed approach to decision-making, resolving problems, and allowing groups with different but complementary missions to develop the best solutions for organizing resources to address problems.

In the aftermath of a large-scale incident, it is anticipated that the City of Portland Disaster Policy Council *will establish a* ***Disaster Recovery Office****. This office could be made up of personnel from Prosper Portland, the Bureau of Planning and Sustainability, and the Office of Community and Civic Life (formerly the Office of Neighborhood Involvement) with assistance from PBEM. A Recovery Task Force will incorporate a Recovery Support Function related to infrastructure systems, of which transportation is a key component. For the purposes of the Plan, such an authority is considered to be in place to lead decision-making and provide command and control responsibilities. This office will coordinate regionally with state, county and other regional agencies and partners. The Transportation Recovery Working Group would support the Disaster Recovery Office.*

1. Establish a Transportation Recovery Working Group – Implementation of the Plan actions would be the responsibility of the TRWG led by PBOT with direct participation by PBEM, ODOT, TriMet, Multnomah County, Metro, the RDPO, and the Port of Portland. The TRWG would prepare recommended actions and strategies for implementation for review by the Disaster Recovery Office.

   The TRWG would have responsibilities for advance planning and preparations including:

   - Developing a framework for transportation recovery and a means of assessing conditions and recommending actions.
   - Establishing member agency roles and responsibilities, as well as those of other transportation entities not on the TRWG (e.g., transportation network companies, human service transportation agencies, etc.). These responsibilities would be as similar as possible to the respective roles and responsibilities during emergency response, including, but not limited to, debris management, monitoring, inspection, mobility restrictions,

enforcement, repairs, administration, maintenance, operations, etc.

- Ensuring that systems are in place to account for the financial implications of completing infrastructure repairs and initiating unique services during recovery with regard to the criteria and qualifications for expense reimbursements that may be eligible under USDOT and FEMA rules and other programs.
- Developing an understanding of each member agency's resources and desired outcome, as well as how each member agency collects and assesses information and what actions they take given different incidents.
- Developing a streamlined process for actions and responsibilities (using a flow diagram) during recovery periods.
- Coordinating the prioritization of investments and advance planning activities.

The TRWG would be activated during recovery (if not during the later stages of response) and have responsibilities for coordinating and collaborating all communications, data, and actions with federal, state and local agencies and providers involved in transportation recovery efforts. Some of the primary coordination and collaboration actions would include:

- Coordinate with response efforts through the Emergency Operations Center (EOC) to transition to recovery efforts.
- Coordinate with regional transportation recovery efforts.
- Identify and prioritize all transportation needs in the impacted region.
- Coordinate with state and federal agencies on fuel availability and rationing.
- Review damage assessments and debris removal activities.
- Determine priorities for additional repair and clearance of routes.
- Identify any permit or other regulatory requirements associated with infrastructure repairs or initiation or discontinuation of transportation services.
- Identify equipment, communications, and staffing requirements for implementation of transportation recovery strategies for review by the Disaster Recovery Office.

With direction from the Disaster Recovery Office, the TRWG would begin initiating some of the fundamental transportation recovery plan strategies, such as:

- Continue the oversight, schedule, and prioritization of continued debris clearance from ETR roadways with consideration of those that provide maximum mobility including river crossings, those with MAX, Streetcar and Frequent Bus Route service, priority bicycle routes and greenways.
- Assess fuel, prioritization of use, and options for rationing for emergency and construction/maintenance vehicles, supply trucks, and buses
- Communicate available travel routes and travel options.
- Implement TDM strategies and policies, including (as appropriate) travel restrictions, gasoline rationing, and priority lanes for certain users such as emergency and maintenance vehicles.

- Begin developing transit service recovery plans including associated fleet and staffing level needs.
- Ensure that sufficient transportation options are available to communities of concern including persons of color, low-income persons, persons with disabilities, persons with limited English proficiency, children, and older adults.

B. Transition from Response to Recovery

As the actions and roles and responsibilities of the recovery stages are entirely dependent on the accomplishments and ongoing work being conducted during the response stage, it's important to illustrate where there is overlap between the two stages and where the actions in one support the actions in the other.

In the development of the Plan there were many discussions about when the recovery period should begin. Since there are differences in the needs, personnel, skillsets, and necessary timeliness of actions between the response and the recovery stages, many individuals wanted to develop a blueprint for when we transition from response to recovery. Those transitions, however, are dependent on the type and severity of each incident. Further, it became clear that there is typically some overlap between the two stages. Finally, there may be declarations by elected officials that the city is transitioning to recovery as a means to reassure and give confidence to their constituents even though many response actions may still be underway.

The conclusion reached was that recovery begins during response and progresses via successive stages. That is, there is a near-term stage of recovery when response activities are still being conducted. There is a mid-term stage where new mobility is being put into service, which expands as more infrastructure becomes available. Finally, there is a long- term stage where restoration is nearing pre-event functionality.

In some instances, there will be "triggers" or accomplishments in the aftermath of an incident which would signify when to transition to recovery or when recovery efforts can be expanded. For example, in support of emergency response efforts, some commercial vendors who provide transportation, communication or administrative services might be asked to provide staffing and equipment to the response effort which would begin their return to regular operations. Further, as more roadways are cleared and businesses open for businesses, added transit service could be provided.

Figure 5.1 on the following page presents high-level activities organized into four recovery stages along with responsible agency.

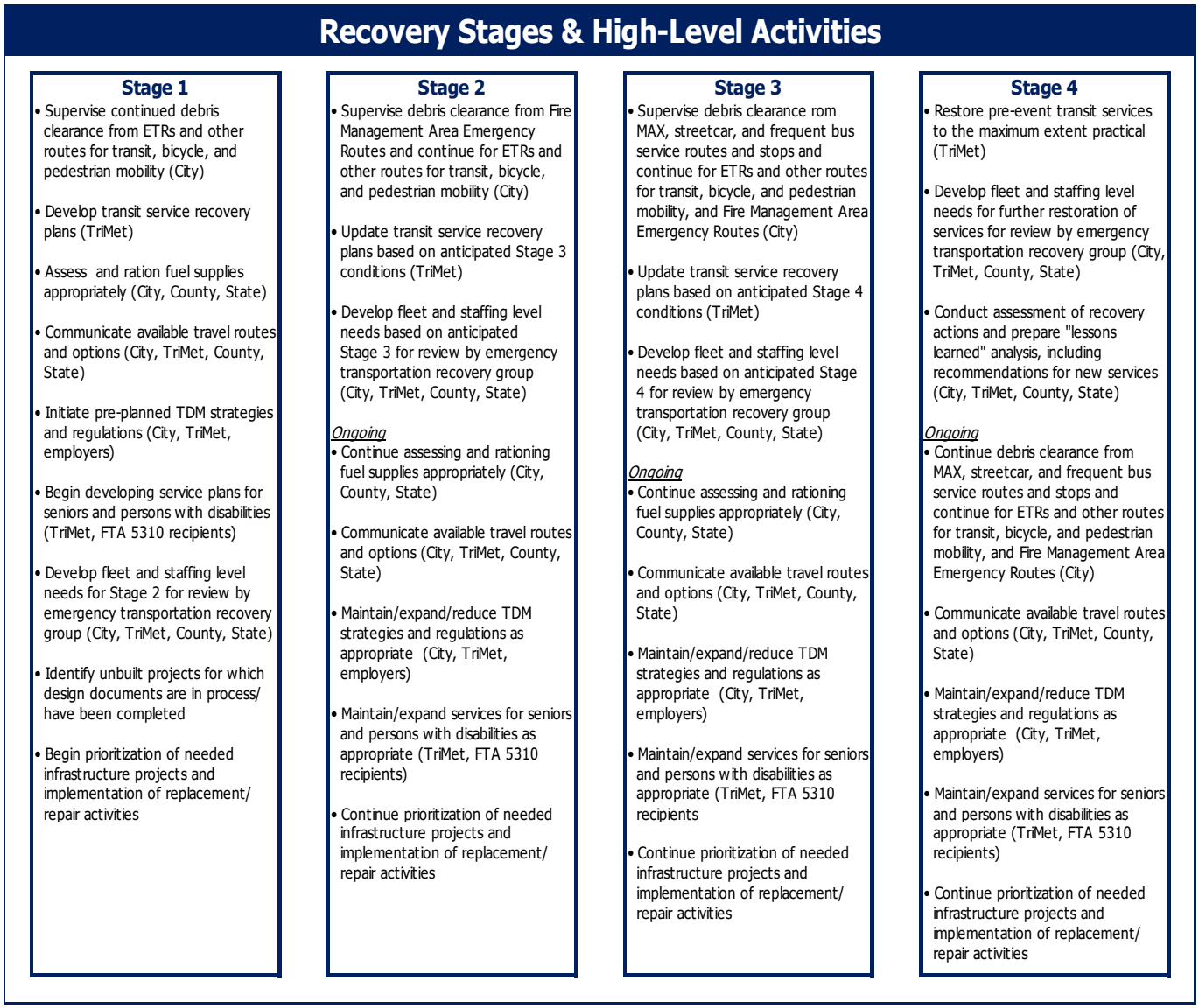

Figure 5.1 Recovery Stages & High-Level Activities

C. TRANSPORTATION RECOVERY PLAN ACTIONS

Once the emergency response effort is underway, the TRWG should be activated in order to develop an understanding of conditions, needs, available resources, and timelines of activities underway, as well as reacquaint themselves with the Plan. Based on conditions, such as the availability of roadways, bridges, tunnels, and other transportation system assets, the TRWG may need to put the greatest amount of their efforts into identifying temporary means for providing mobility and accessibility to the traveling public.

This section provides the recommended actions of the Plan organized into seven elements for the TRWG to consider as they undertake their collective activities. Some are intended to manage traffic flows, while others seek to increase the capacity and service levels for certain modes. Others, such as Legal Framework and Contracting Options are essential to providing the authority to implement certain strategies and for advising the traveling public about their options.
Members of the Plan's Advisory Committee and other stakeholders played a crucial role in

developing the actions. The process involved workshops, committee discussions, and interviews, as well as reviews of existing plans and recovery guidance literature.

Moreover, several elements have been developed as part of official adopted documents including the Portland Comprehensive Plan, Portland Transportation System Plan, Portland Climate Action Plan, Multnomah County Natural Hazards Mitigation Plan, TriMet Emergency Management Plan, as well as the MAP and several others.

The seven (7) elements, outlined in Figure 5.2, are tools that can be applied based on the conditions present during response and as recovery advances. Some of the actions are noted to have a beginning and expansion period (indicated in Figure 5.2 with cells colored green and blue, respectively), while others require continuous activity by Transportation Recovery Plan personnel (indicated in yellow).

	Recovery Stage 1	Recovery Stage 2	Recovery Stage 3	Recovery Stage 4
1. Communications Framework				
2. Infrastructure Assessment/Repairs				
3. Transit Service and Multimodal Planning and Coordination				
4. Transportation Demand Management				
5. Communities of Concern				
6. Legal Contracting Options and Agreements				
7. Plan Evaluation /Evolution/ Training				

- Continuous Recovery Actions
- Initiate Recovery Actions
- Expand Recovery Actions

Figure 5.2 Transportation Recovery Elements by Stage

ELEMENT #1: COMMUNICATIONS FRAMEWORK

Delivering accurate information, including condition assessments and suggested transportation options to the public via traditional media outlets, social media, directly to individuals and households, and in the field is essential. The City of Portland and its partner jurisdictions have extensive experience reporting these kinds of messages during emergencies and the days following. The strategies used in recovery continue many, if not all, of the communication strategies initiated during emergency response. However, the frequency and content may differ when transitioning into recovery dependent on conditions. The recovery communication functions should be closely aligned with the activities of the Joint Communication Team established during the response phase. This existing framework should be used through the transition and until a recovery communication framework is established.

Below are strategies for consideration during all stages of recovery. In particular, social media tools have proven to be a highly effective communication tool for governments to transmit press releases, information on planning processes, and as means of soliciting public input. Prominent social media channels include Facebook, Twitter, Instagram, YouTube, LinkedIn, and Pinterest with new apps being developed and used regularly. Social media offers the potential to interact with the public on an iterative basis, providing initial content and then responding based on feedback received. It is important to be flexible with emerging social media platforms to ensure communication frameworks are evolving.

Advance Planning/Preparations

- Reiterate to employers the availability of the Plan and presence of alternative means of transportation.
- Partner with Get Portland Moving and the private sector to get the message out beyond just transportation.
- Update Portland's online *Map App* (https://www.portlandmaps.com/bps/mapapp/), including those for transit, bicycle, and pedestrian routes so that users can identify the status of potential routes.
- Support the creation of apps that provide a "one-stop shop" for all modes of travel with mapping tools to assist users with real time information.
- Determine if the City has an adequate number of fixed and portable variable message signs (VMS) and associated equipment that can be deployed quickly.
- Develop post-event safety and travel messages for traditional and social media based on the 2013 report Day Labor, Worker Centers & Disaster Relief Work in the Aftermath of Hurricane Sandy.
- Increase PBEM's capacity to partner with the Office of Community and Civic Life, Diversity in Civic Leadership program, and Community Engagement Liaisons program to connect communities of concern with information of transportation options *(also listed in Element 5).*
- Prepare culture- and language-appropriate webpages for Portlanders to access information on available transportation options in their preferred language *(also listed in Element 5).*
- Conduct citywide preparedness tours of elected and appointed officials and prominent community associations to highlight projects that improve the resiliency of transportation infrastructure.

Execution

- Continue the operation of the Joint Information Center (JIC), as described in the MAP and ensure a PIO representative is assigned to be there.
- Evaluate communications requirements and make recommendations for ensuring communications capabilities.
- Communicate to the public where repairs have been completed and where they are underway.
- Use vehicle-tracking systems in City maintenance vehicles to transmit up-to-date conditions via Bluetooth about conditions in the field, which may be forwarded on to media outlets, web pages, social media, and VMS to advise travelers.
- Provide real-time information to the public about the availability of fuel.
- Work directly with staff from Google Maps, WAZE, and other internet traffic advisory services about suggested routes – requesting that those services know of road closures/detours that are expected to last more than five days, where maintenance crews are working, etc.
- Use direct and assertive language in conveying road conditions information via variable message signs (e.g., use message "Traction Devices Required" instead of "Snow Route" signs on steep and slippery roadways.
- Always provide direct routes for travelers to detour to because of closures (including when conducting repairs).

Element 1 Checklist

COMMUNICATIONS FRAMEWORK	
ITEM #	**ACTIONS**
1. Advance Planning/Preparations	a. Partner with the private and not-for-profit sector organizations to: Educate employers about alternative means of transportation so that they can inform their employees to both leave early and to use alternative modes. Get the message out – beyond just transportation. For example, suggestions to commuters to stay over in hotels or to eat at local restaurants. Provide cultural- and community-specific training for community leaders on how to identify alternative arrangements (e.g., routes and modes) for making trips. Provide education for rental property owners and property managers on available transportation options. b. Develop post-event safety messages related to transportation that can be deployed on VMS.
2. Advance Planning – Materials	a. Send out mailers to Portland households and in neighborhood newsletters about our natural incident hazard risks and how to be prepared. b. Determine if City has an adequate number of signs and associated materials. c. Mapping Updates use common software that most agencies and the public utilize to provide access to WEBEOC of Portland transit, bicycle and pedestrian routes so that they are highly visual and user-friendly d. Web pages, culture- and language-appropriate webpage for new Portlanders to access emergency information, videos, and events in their preferred language. e. Create apps that provide a 'one-stop shop' about all modes of travel with mapping tools to assist users with real time information. "I want to get from A to B" and the app would show you how to do so with a car, via a carpool, bus/LRT, bicycle route, and pedestrian route, with real field information.
3. Communications Delivery	a. Assemble information for Evaluating communications requirements and make recommendations for ensuring communications capabilities Using vehicle-tracking systems in City maintenance vehicles to transmit up-to-date conditions via Bluetooth about conditions in the field. Working with traffic advisory services about suggested routes – requesting that those services know of road closures/detours that ate expected to last more than five days, where maintenance crews are working, etc. Assigning a PIO representative to the Joint Information Center (JIC), if activated. b. Communication Delivery: Inform public where repairs have been completed and where they are underway Provide real-time information to the public about the availability of fuel Use "assertive' (in contrast to "suggestive") direction in field and media messages about road conditions and detour routes

ELEMENT #2: INFRASTRUCTURE ASSESSMENT/REPAIRS

Much of the emphasis during the response and recovery periods will be in repairing, replacing, and demolishing infrastructure. The methods and protocols for completing these actions involve completion of assessments, preparing designs, completing environmental reviews, acquiring permits, programming funding, hiring contractors, managing traffic during construction, undertaking construction, and inspecting the facility or structure prior to opening it to the public. These are traditional activities conducted by the City and its partner agencies; however, the circumstances of response and recovery requires some special considerations. An important objective of reconstruction activities is that they strive to meet both immediate needs and longer-term considerations as many of the permanent facilities and structures built will have life cycles of several decades. This is why aligning infrastructure repairs with broader goals and objectives of adopted plans is imperative.

Advance Planning/Preparations

- Update the ETR map to include bridges that are now seismically improved and OHSU. Alternatively, consider the addition of secondary ETRs for these areas. Also provide overlays to the ETRs which distinguish state, county and city roadways.
- Collaborate with the RDPO and Metro in their work to update ETRs and emergency/recovery plans.
- Update current inventory with risk and vulnerability assessments of assets including roads, bridges, tunnels, signs, poles, traffic control devices, vehicles, equipment, etc.
- Position some City and County maintenance vehicles on the west sides of the Willamette River in case bridges fail and east-west access is blocked.
- Identify high-traffic bridges and flood-prone routes and establish alternative routes to be used in case they are flooded.
- Identify vulnerable and non-resilient infrastructure.
- More fully incorporate resiliency into the designs and equipment/materials for infrastructure projects in TIPs and CIPs for ETRs that are seismically vulnerable and prone to floods and landslides.
- Replace unsafe or structurally-compromised bridges and rebuild to more flood-resistant standards.
- Research and recommend temporary solutions to river crossings in the event that bridges are closed.
- Develop a process for determining whether permanent (i.e., full) or temporary repairs to bridges and other transportation system structures is more prudent given need to reopen versus cost and other key factors.

Coordination and Collaboration

- The Plan actions should inform agencies preparing CIPs about where the recovery routes are so that they receive adequate attention in capital planning processes.

Execution

- While each agency will conduct damage assessments and field inspections of their transportation facilities per each agency's procedures, those inspections should be scheduled to report conditions to the TRWG within a window of time and should utilize consistent reporting procedures.
- Using the PDX APT, each agency should develop its recommended plan for reconstruction actions for each damaged

facility including their order of priority, a preliminary construction schedule, and their construction cost to the TRWG within a window of time and should utilize consistent reporting procedures.

- These reconstruction plans should also identify debris removal needs, utility reconstruction, construction staging areas, required permits, environmental protection requirements, procurement of services methods, hazardous materials inspections and safety procedures, monitoring and quality control, and traffic management including detours, advisory signage, and field staff.
- Document any and all financial expenditures
- Prepare progress reports that satisfy the needs of both the TRWG as well as the agency PIOs and other Communications staff.

Element 2 Checklist

	INFRASTRUCTURE ASSESSMENT/REPAIRS
ITEM #	**ACTIONS**
1. Advance Planning/ Preparations	a. Update: - ETR map to include seismically improved bridges and OHSU - risk and vulnerability assessments of assets including roads, bridges, tunnels, signs, poles, traffic control devices, vehicles, equipment, etc. b. Position some City and County maintenance vehicles on the west side of the Willamette River in case bridges fail and east-west access is blocked. c. Identify: - High-traffic bridges and flood-prone routes and establish alternative routes to be used in case they are flooded - Vulnerable and non-resilient infrastructure. d. Develop: - Resiliency designs and equipment/materials for infrastructure projects in TIPs and CIPs for ETRs that are seismically vulnerable and prone to floods and landslides. - Contingency plans for when to complete permanent (i.e., full) vs temporary repairs to bridges and other transportation system structures. e. Replace unsafe or structurally-compromised bridges and rebuild to more flood-resistant standards. f. Research and recommend temporary solutions to river crossings in the event that bridges are closed.
2. Coordination/ Collaboration	a. The Plan actions should inform agencies preparing CIPs about where the recovery routes are so that they receive adequate attention in capital planning processes. b. Promote and/or require the use of resilient design systems and features and sustainable materials in reconstruction/replacement projects.

Element 2 Checklist (continued)

INFRASTRUCTURE ASSESSMENT/REPAIRS	
3. Execution	a. Schedule multi-agency damage assessments and field inspections and report to Transportation Recovery Working Group. b. Develop and prioritize reconstruction and repair plans. c. Reconstruction/Repair plans should include plans for debris removal needs, utility reconstruction, construction staging areas, required permits, environmental protection requirements, procurement of services methods, hazardous materials inspections and safety procedures, monitoring and quality control, and traffic management including detours, advisory signage, and field staff. d. Document any and all financial expenditures e. Prepare progress reports that satisfy the needs of both the TRWG as well as the agency PIOs and other Communications staff.

ELEMENT#3: TRANSIT SERVICE AND MULTIMODAL PLANNING AND COORDINATION

Transit service and multimodal planning (including pedestrians, bicyclists, and carsharing and carpooling) during recovery will be a dynamic process based on the available infrastructure, debris clearance, emergency route needs, and availability of staff, equipment, and fuel. All members of the TRWG (including Operations, Maintenance, Communications, Social Service providers, etc.) must work closely to make sure that their plans are feasible and efficient. While some transit plans may be similar to pre-event operations, others may be very different and require a careful description of changes that can effectively be publicized to the general public in a clear and understandable manner. Two major priorities for recovery planning are to provide service on the Frequent Bus Service network (similar to what happens during snow and ice events) and communicate current services and availability of infrastructure to both households and employers.

<u>Advance Planning/Preparations</u>

- Update the ETR map by including access to TriMet's Center Street and Merlo garages. Any future facilities that are critical to transit operations should be included on the map and serviced by ETRs.
- Identify MAX, Portland Streetcar, and Frequent Bus Routes that are on ETRs.
- Identify secondary level of ETRs as alternatives and next level of prioritization.
- Review for gaps in serving communities of concern including persons of color, low-income persons, persons with disabilities, persons with limited English proficiency, children, and older adults.
- Identify streets / corridors that are parallel to MAX and Enhanced Bus Route network that may act as surrogates should some of those routes be unavailable, utilizing MAX bus bridging plans to the fullest extent possible.
- Identify priority pedestrian routes – considering those that are within greenways, trails, and sidewalks/crosswalks at, as well as to and from MAX stations and Enhanced Bus Route bus stops.
- Identify priority bicycle routes – consider bike boulevards, bicycle lanes, and Biketown and other bike share facilities - with emphasis on

routes that access MAX stations and Enhanced Bus Route bus stops.

- Consider expansion of on-site fuel supplies or fuel distribution for TriMet buses.
- Prepare and adopt MOUs to allow agencies to establish dedicated transit and/or HOV bus lanes during recovery periods (which are only now permitted under an Emergency Declaration) (also listed in Element 6)
- Consider requesting that Neighborhood Emergency Teams (NETs) support debris clearance of sidewalks and bicycle lanes.
- Work with TriMet to understand fleet composition, fuel and electric charging/future clean power bus needs, and prioritization criteria for determining use of the fleet.
- Work with complementary paratransit and other demand response providers to understand services that can be provided for older adults and people with disabilities.
- Utilize non-TriMet bus fleets such as school buses and buses from other service districts. Prepare and adopt MOUs with those non-TriMet organizations that could provide buses to help support recovery of public transportation services.

Coordination and Collaboration

- Schedule debris clearance to coincide with introduction of new transit routings, hubs, and stations/stops. Be explicit about the street space to be made available during debris clearance – e.g., in some cases, clearing sidewalks and bicycle lanes of debris may be required.
- TriMet to coordinate introduction of transit services with actions being performed and scheduled by PBOT, Multnomah County and ODOT, including the location and operation of mass sheltering facilities.
- The Transportation Recovery Plan strategies and services should inform agencies preparing CIPs about where the recovery routes are so that they receive adequate attention in capital planning processes.
- Promote and/or require that any re-construction project utilize resilient design systems and features and sustainable materials.
- Coordinate with transportation network companies and carsharing, ridesharing, and other shared mobility providers to ensure they are aware of the current status of infrastructure and services.

Execution

- Begin developing transit service recovery plans (Recovery Stage 1, Recovery Stage 2, Recovery Stage 3, and Recovery Stage 4) in accordance with roadway and track conditions for review by emergency management teams.
- Utilize Alternative Prioritization Tool (APT) to identify corridors that accommodate the greatest pre-event travel demand.
- Where conditions permit, restrict usage or dedicate lanes on the ETR routes to emergency responders, MAX, Portland Streetcar, TriMet buses, and other high-occupancy vehicles.
- Ensure that pedestrian and bicycle pathways to and from transit services are safe and maintained. For buses, maintain high levels of access within a ¼-mile of bus service, and a ½-mile for LRT service.
- Consider use of park-and-rides as temporary hubs for multiple routes, including routes that are not currently served by park-and-rides.
- Match priority transit, pedestrian and bicycle routes to Safe Routes to Schools pathways that may be given priority for clearance during selected incidents.

- Emphasize linking external modes to the ETRs – e.g., dedicated lanes between ETRs and Amtrak, PDX, Greyhound buses, and planned TriMet bus service to PDX beginning in 2018.
- Assess fuel and ration appropriately.
- Communicate available travel routes and travel options.
- Develop fleet and staffing level needs, and implementation schedule for Recovery Stage 1, Recovery Stage 2, Recovery Stage 3, and Recovery Stage 4 conditions.

Element 3 Checklist

TRANSIT SERVICE AND MULTIMODAL PLANNING AND COORDINATION	
ITEM #	**ACTIONS**
1. Advance Planning/ Preparations	a. Update ETR map to include access to TriMet's Center Street and Merlo garages to ETR route map. b. Identify: - corridors with greatest pre-event travel demand using APT - MAX, Portland Streetcar, and Enhanced Bus Routes that are on ETRs. - secondary level ETRs as alternatives to next level prioritization - review for gaps in serving vulnerable communities - streets / corridors that are parallel to MAX and Enhanced Bus Route network that may act as surrogates should some of those routes be unavailable. - priority pedestrian routes – considering those that are within greenways, rails, and sidewalks/crosswalks at, as well as to and from MAX stations and Enhanced Bus Route bus stops. - priority bicycle routes – consider bike boulevards, bicycle lanes, and Biketown and other bike share facilities - with emphasis on routes that access MAX stations and Enhanced Bus Route bus stops. c. Consider expansion of on-site fuel supplies or fuel distribution for TriMet buses. d. Prepare and adopt MOUs to: - allow agencies to establish dedicated transit and/or HOV bus lanes during recovery periods (which are only now permitted under an Emergency Declaration). - allow for use of non-TriMet buses to support public transportation services during recovery.
2. Coordination/ Collaboration	a. Schedule debris clearance to coincide with introduction of new transit routings, bubs, and stations/stops. b. TriMet to coordinate introduction of transit services with actions being performed and scheduled by PBOT, Multnomah County, and ODOT. c. Transportation Recovery Plan strategies and services should inform agencies preparing CIPs about where the recovery routes are so that they receive adequate attention in capital planning processes. d. Promote and/or require that any re-construction project utilize resilient design systems and features and sustainable materials.

Element 3 Checklist (continued)

TRANSIT SERVICE AND MULTIMODAL PLANNING AND COORDINATION	
3. Execution	a. Begin developing transit service recovery plans (Recovery Stage 1, Recovery Stage 2, Recovery Stage 3, and Recovery Stage 4) in accordance with roadway and track conditions for review by emergency management teams b. Assess fuel and ration appropriately c. Communicate available travel routes and travel options d. Provide transportation for elderly/disabled customers where needed e. Develop fleet and staffing level needs, and implementation schedule for Recovery Stage 1, Recovery Stage 2, Recovery Stage 3, and Recovery Stage 4 conditions

ELEMENT #4: TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) includes strategies that improve the efficiency and reliability of travel without building additional infrastructure (i.e., activities by users that get more out of the existing inventory of roads, bridges, rail lines, and bicycle facilities). They may involve incentives to travel in carpools, by transit, bicycle, or on foot and, conversely, disincentives to driving alone. TDM also includes enabling technologies that help manage traffic flow and communicate with travelers in real-time. Some TDM strategies are focused on encouraging people to travel during off-peak periods, while others seek to make options to driving alone more convenient and, therefore, attractive. TDM strategies will be a valuable tool during transportation recovery when mobility may be limited by damaged infrastructure or paralyzed services. Within the city, there are several TDM strategies currently in use. During recovery periods, the usage of these programs would likely take on a more prominent role and could be supplemented with more intense mobility techniques.

<u>Advance Planning/Preparations</u>

- Disseminate information about transportation options in all communications with the public through media advisories and reports, websites, social media, signage, and mailers to households and businesses.
- Develop outreach to employers to emphasize the benefits of alternative work schedules such as flextime, staggered hours, and telecommuting.
- Continue promotions and incentives for carsharing and bikesharing programs and services.
- Prepare and adopt MOUs to allow agencies to establish various TDM strategies such as dedicating roadway space to HOVs, restricting vehicle access during portions of the day or days of the week, restricting or limiting on-street parking, increased parking fees, and others (some of which are only now permitted under an Emergency Declaration).

<u>Coordination and Collaboration</u>

- Schedule debris clearance to coincide with introduction of new TDM strategies where appropriate.
- Coordinate with employers, TMAs and other similar organizations about the timing and type of TDM strategies to be employed during recovery.

- PBOT to coordinate introduction of TDM strategies with actions being performed and scheduled by TriMet, Multnomah County and ODOT.
- Leverage public and private resources to increase the use of ridesharing and other shared commuting options.

Execution

- Begin developing TDM strategy plans (Recovery Stage 1, Recovery Stage 2, Recovery Stage 3, and Recovery Stage 4) in accordance with roadway and track conditions for review by emergency management teams.
- Where conditions permit, restrict usage or dedicate lanes on the ETRs to emergency responders, MAX, Portland Streetcar, TriMet buses, and other high-occupancy vehicles.
- Ensure that highly utilized and available pedestrian and bicycle pathways are safe and maintained. For buses, maintain high levels of access within a ¼-mile of bus service, and a ½-mile for LRT service.
- If demonstrated to improve conditions, consider requiring two or more passengers in each private vehicle on certain roadways or at geographic screen lines.
- Optimize rideshare services to complement and supplement other TDM services. Look for ways to prioritize operations such as operating as jitneys with a minimum of three passengers per vehicle.
- Consider restricting or limiting on-street parking to carpool vehicles.
- Leverage public and private resources to increase the use of ridesharing and other commuting options
- Actively work with major employers to develop staggered work schedules, flextime, and telecommuting programs.
- Consider rationing fuel to conserve supply for emergency and disaster relief vehicles as well as buses, if appropriate.
- Communicate to media and public about any TDM strategies that may modify normal travel decision-making and patterns.
- Develop staffing level and equipment needs, and implementation schedule for Recovery Stage 1, Recovery Stage 2, Recovery Stage 3, and Recovery Stage 4 conditions.

Element 4 Checklist

	TRANSPORTATION DEMAND MANAGEMENT
ITEM #	**ACTIONS**
1. Advance Planning/ Preparations	a. Disseminate information and promote: - Transportation options in all communications with the public through media advisories and reports, websites, social media, signage, and mailers to households and businesses. - Benefits of alternative work schedules, such as flextime, staggered hours, and telecommuting. b. Continue promotions and incentives for carsharing and bikesharing programs and services. c. Prepare and adopt MOUs to allow agencies to establish various TDM strategies such as dedicating roadway space to HOVs, restricting vehicle access during portions of the day or days of the week, restricting or limiting on-street parking, increased parking fees, and others (some of which are only now permitted under an Emergency Declaration).

Element 4 Checklist (continued)

	TRANSPORTATION DEMAND MANAGEMENT
2. Coordination/Collaboration	a. Schedule debris clearance to coincide with introduction of new TDM strategies where appropriate. b. With employers and TMAs about timing and type of TDM strategies to be employed. c. PBOT to coordinate introduction of TDM strategies with actions being performed and scheduled by TriMet, Multnomah County and ODOT. d. Leverage public and private resources to increase the use of ridesharing and other shared commuting options.
3. Execution	a. Begin developing TDM strategy plans (Recovery Stage 1, Recovery Stage 2, Recovery Stage 3, and Recovery Stage 4) in accordance with roadway and track conditions for review by emergency management teams. Consider: - Restricting usage on the ETRs to emergency responders, MAX, Portland Streetcar, TriMet buses, and other high-occupancy vehicles. - Requiring two or more passengers in each private vehicle on certain roadways or at geographic screen lines. - Allowing ridesharing services to operate as jitneys with a minimum of three passengers/vehicle. - Restricting or limiting on-street parking to carpool vehicles. - Allowing ridesharing services to operate as jitneys with a minimum of three passengers/vehicle - Restrictions to ratio fuel to conserve supply for emergency and disaster relief vehicles as well as buses, if appropriate. b. Ensure that highly utilized and available pedestrian and bicycle pathways are safe and maintained. For buses, maintain high levels of access within a ¼-mile of bus service, and a ½-mile for LRT service. c. Leverage public and private resources to increase the use of ridesharing and other commuting options. d. Work with major employers to develop staggered work schedules, flextime and telecommuting programs. e. Communicate to media and public about any TDM strategies which may modify normal travel decision-making and patterns. f. Develop staffing level and equipment needs, and implementation schedule for Recovery Stage 1, Recovery Stage 2, Recovery Stage 3, and Recovery Stage 4 conditions.

ELEMENT #5: COMMUNITIES OF CONCERN

There are equity considerations that need to be incorporated into the transportation recovery process. Those without access to private automobiles are more highly dependent on public transportation, walking, bicycling than the rest of the population. People who rely on paratransit services or other demand responsive services will continue to require those services during recovery. These include persons of color, low-income persons, persons with disabilities, persons with limited English proficiency, children, and older adults. In addition, under some incident scenarios, tens of thousands of individuals will be displaced due to damages to their homes from any number of incidents.

Advance Planning/Preparations

- To the maximum extent possible, site temporary shelters within walking distance of the ETRs and primary transit facilities.
- Utilize location specific information from vulnerability assessments prepared by Multnomah County, PBEM, Metro and others to identify specific transportation services and facilities that are not provided in Elements 3 and 4.
- Develop post-event safety and travel messages for traditional and social media based on the 2013 report "Day Labor, Worker Centers & Disaster Relief Work in the Aftermath of Hurricane Sandy" (also listed in Element 1).
- Increase PBEM's capacity to partner with the Office of Community and Civic Life, Diversity in Civic Leadership program, and Community Engagement Liaisons program to connect communities of concern with information on transportation options (also listed in Element 1).
- Expand the NET program (Neighborhood Emergency Team—volunteers trained by PBEM and Portland Fire & Rescue to provide recovery assistance within their own neighborhoods) into every neighborhood in Portland and expand beyond the neighborhood structure to non-geographic communities (e.g., immigrant and refugee communities) (also listed in Element 1).
- Prepare culture- and language-appropriate webpages for Portlanders in communities of concern to access information on available transportation options in their preferred language (also listed in Element 1).

Coordination and Collaboration

- Ensure that transportation service schedules are coordinated with the schedules for shelters – e.g., some shelters require residents to leave so that maintenance and cleaning can be conducted.
- Partner with Portland Office of Community and Civic Life, Multnomah County (Community Services, Health, Diversity and Equity, and Emergency Management) to identify, review and prioritize the provision of transportation services and infrastructure repairs where needed.
- Continue providing assistance at temporary Local Assistance Centers established during emergency response to provide a centralized location for ("one stop shop") for services and resource referrals for the unmet needs of disaster victims.

Execution

- Implement those services and repairs for communities of concern recommended by Portland Office of Community and Civic Life and Multnomah County agencies.

Element 5 Checklist

	COMMUNITIES OF CONCERN
ITEM #	**ACTIONS**
1. Advance Planning/ Preparations	a. To the maximum extent possible, site temporary shelters within walking distance of the ETRs and primary transit facilities. b. Utilize location specific information from vulnerability assessments prepared by Multnomah County, PBEM, Metro and others to identify specific transportation services and facilities that are not provided in Strategies 3 and 4. c. Provide cultural- and community-specific training for community leaders on home safety, hazard mitigation (e.g. non-structural seismic strengthening), food and supply storage, response considerations for people with special needs, and household and neighborhood preparedness. d. Develop post-disaster safety and travel messages based on the 2013 report "Day Labor, Worker Centers & Disaster Relief Work in the Aftermath of Hurricane Sandy." e. Provide education for rental property owners and property managers on communicating information about available transportation options. f. Provide training on evacuation and sheltering for retirement home staff and all licensed nursing homes and assisted living care providers. g. Increase PBEM's capacity to provide community trainings and partner with the Office of Community and Civic Life, Diversity in Civic Leadership program, and Community Engagement Liaisons program to connect underserved communities with training opportunities. h. Prepare culture- and language-appropriate webpages for Portlanders in communities of concern to access information on available transportation options in their preferred language.
2. Coordination/ Collaboration	a. Ensure that transportation service schedules are coordinated with the schedules for shelters – e.g., some shelters require residents to leave so that maintenance and cleaning can be conducted. b. Partner with Portland Office of Community and Civic Life, Multnomah County (Community Services, Health, Diversity and Equity, and Emergency Management) to identify, review and prioritize the provision of transportation services and infrastructure repairs where needed. c. Continue providing assistance at temporary Local Assistance Centers established during emergency response to provide a centralized location for ("one stop shop") for services and resource referrals for the unmet needs of disaster victims.
3. Execution	a. Implement those services and repairs for communities of concern recommended by Portland Office of Community and Civic Life and Multnomah County agencies.

ELEMENT #6: LEGAL CONTRACTING OPTIONS AND AGREEMENTS

The City of Portland and many of its partner agencies contract with private vendors to assist in meeting its maintenance/construction and mobility obligations on an as-need basis. These agreements are critical to the clearing of debris, completing repairs, moving citizens and other actions that are essential to the success of any recovery effort. In addition, there are several laws, ordinances, plans, and programs at the federal, state, and local level that need to be

consulted in carrying out the Transportation Recovery Plan. At the federal level alone, there are numerous transportation (e.g., the Americans with Disabilities Act) and environmental (e.g., the Clean Air Act) related laws that govern how we construct repairs to infrastructure repairs and how we provide transportation services.

With respect to funding, the Disaster Mitigation Act, FEMA, National Incident Management System (NIMS), and the Community Development Block Grant Disaster Resilience Program require that hazard mitigation plans are in place and provide opportunities for funding elements of those plans. Funding for reimbursements is, however, dependent on following procedures related to oversight and reporting that must be met. The City and its partners should be mindful of these requirements to ensure that eligible costs can be reimbursed.

<u>Advance Planning/Preparations</u>

- Emergency Declarations to Undertake Recovery Activities
  - Identify recommendations contained herein that can be included in an emergency declaration(s) for recovery along with the associated timelines and agencies and/or officials charged with carrying them out (as determined at the time of the declaration) pursuant to Oregon Revised Statutes 401.309 and Portland City Code and Charter Chapter 15.04.
  - Create an inventory of said recommendations and associated timelines and agencies and/or officials charged with carrying them out.
- Waivers and Expedited Review of Permitting Activities
  - Catalog permits needed from Federal, State, County, and City agencies as part of infrastructure construction activities.
  - Create a list of permits that will be required from Federal and State agencies as part of the recovery process.
  - Determine which permits can request temporary waivers from their requirements and which would benefit from expedited review during the recovery process.
  - Meet with appropriate staff from the oversight agencies to discuss the need for a waiver or expedited review.
  - Create associated templates to request waivers and/or expedited review for each permit and/or oversight agency during recovery.
- Alternative Delivery & Contracting Procedures
  - Identify appropriate opportunities for alternative project delivery methods; namely, Design-Build and Construction Management at Risk for construction (Integrated Project Delivery can be considered but are prone to take longer to develop a contract) and Operate-Maintain-Manage where preferred Transportation System Management & Operations (TSMO) activities outstrip PBOT personnel capabilities.
  - Identify financial incentives and incorporate them into contracts to accelerate delivery (e.g., additional fee for early completion/opening to traffic, incorporating time in addition to cost in fee structures, etc.).
  - Develop a listing of currently programmed improvements and types of projects that would benefit from alternative delivery and/or incentive contracting for reference during recovery.

- Draft, review, and finalize language needed for inclusion of incentive provisions in contracts for construction and operations contracts.

- Prepare Memoranda of Understanding (MOUs)
  - For developing partnerships with staff from Google Maps, WAZE and other internet traffic advisory services about suggested routes – requesting that those services know of road closures/detours that ate expected to last more than five days, where maintenance crews are working, etc.
  - To allow agencies to establish dedicated transit and/or HOV bus lanes during recovery periods (which are only now permitted under an Emergency Declaration) (also listed in Element 3)
  - To allow agencies to establish dedicated transit and/or HOV bus lanes during recovery periods (which are only now permitted under an Emergency Declaration).
- Contractor Pre-Qualification
  - Institute a pre-qualification program for vendors (e.g., design, materials, construction) consisting of:
    - Development of solicitation materials and evaluation criteria that considers elements instrumental to the recovery process.
    - Solicitation of qualifications/capabilities and selection of responsive vendors.
    - Creation of pre-qualified vendor database for use during recovery.
- Interagency Agreements
  - Inventory existing agreements, MOUs, etc. between the City and transportation partners including but not limited to:
    - Oregon DOT
    - Multnomah County DOT
    - TriMet
    - Port of Portland
    - Transportation Management Associations
    - Ride-hailing/Transportation Network Companies
  - Identify how these agreements allow for the implementation of various TSMO strategies and actions such as planned lane closures, variable/dynamic lane assignments, etc.
  - Determine needed updates to existing agreements and develop agreements that do not exist to address needed coordination and cooperation for implementation of TSMO strategies.

Element 6 Checklist

	LEGAL CONTRACTING OPTIONS AND AGREEMENTS
ITEM #	**ACTIONS**
1. Emergency Declarations to Undertake Recovery Activities	a. Issue necessary emergency declarations based on inventory of said recommendations and associated timelines and agencies and/or officials charged with carrying them out. b. Monitor progress of recommendations and rescind emergency declarations upon completion.

Element 6 Checklist (continued)

	LEGAL CONTRACTING OPTIONS AND AGREEMENTS
2. Alternative Delivery & Contracting Procedures	a. Review recommended post-response/recovery improvements for opportunities to utilize alternative project delivery methods and contracting incentives. b. Based on review, include language needed for inclusion of incentive provisions in contracts for construction and operations contracts of recommended post-response/recovery improvements.
3. Memoranda of Understanding	a. For developing partnerships with staff from Google Maps, WAZE and other internet traffic advisory services about suggested routes – requesting that those services know of road closures/detours that ate expected to last more than five days, where maintenance crews are working, etc. b. To allow: - agencies to establish dedicated transit and/or HOV bus lanes during recovery periods (which are only now permitted under an Emergency Declaration) - agencies to establish dedicated transit and/or HOV bus lanes during recovery periods (which are only permitted under an Emergency Declaration)
4. Contractor Pre-Qualification	a. Determine what pre-qualified contractors are available and able to participate in recovery efforts. b. Engage available pre-qualified contractors based as needed. c. Re-determine what pre-qualified contractors are available and able to participate in recovery efforts as said efforts progress and engage newly available contractors.
5. Interagency Agreements	a. Utilize interagency agreements for aforementioned transportation partners to implement needed strategies and actions.

ELEMENT #7: PLAN EVALUATION /EVOLUTION/ TRAINING

As the Transportation Recovery Plan requires participation, commitment, and coordination with multiple bureaus, partner jurisdictions, and private sector stakeholders, it is critical that the Plan's actions be carried out in a programmatic manner and that its priorities, implementing authorities, and staffing resources evolve and expand. Future recovery planning efforts should be overseen by PBOT with participation by a steering committee representing the Plan partners, community leaders, and the Portland City Council.

Advance Planning/Preparations

- Future recovery planning efforts may use or refer to the data prepared for the Mitigation Action Plan update, including revised risk assessment and vulnerability analysis and coordinated mitigation activities with regional communities and agencies.

Coordination and Collaboration

- Monitor FEMA hazard mitigation grant programs and seek opportunities to leverage City and other funding programs for the development of resilient infrastructure. In seeking resources from non-City sources, the goals and objectives of the following City plans and programs are consistent with the Plan and should be cited in applications requesting funding to demonstrate community support:
  - Portland Comprehensive Plan

- Portland Transportation System Plan
- Climate Action Plan
- PBEM Strategic Plan
- Portland Parks & Recreation Master Plan
- BPS Strategic Plan
- BES Strategic Plan
- Portland Water Bureau (PWB) Water System Seismic Study
- Johnson Creek Restoration Plan
- Portland Watershed Management

Element 7 Checklist

PLAN EVALUATION / EVOLUTION / TRAINING	
ITEM #	**ACTIONS**
a. Advance Planning/ Preparations	a. Consider ways to incorporate mitigation actions that will support transportation recovery in future regular updates to the Mitigation Action Plan.
b. Coordination/ Collaboration	a. Monitor grant opportunities and other means to support the development of resilient infrastructure.

6. POTENTIAL FUNDING & REIMBURSEMENT

Identifying and securing funding and financing for improvements to the transportation system will be a key action item during the recovery process. Traditional transportation revenue sources will continue to be critical during recovery, but there will also be other programs that will need to be accessed. This requires that staff across bureaus (e.g., PBEM, PBOT, etc.) and in various roles (e.g., budgeting, procurement, project management, etc.) be aware of and understand the various requirements of what may be unfamiliar funding programs to them. This can range from eligibility requirements so that effort is not spent pursuing funding that cannot be used for the intended purpose to documentation requirements to ensure that records are properly produced and maintained for expenditures.

While federal and state funding programs can change as the administrations and legislatures in Washington, D.C. and Salem do, there are certain departments, administrations, and offices that have provided funding for transportation and emergency recovery, and will continue to exist into the foreseeable future. In the case of federal funding and financing programs, the Catalog of Domestic Federal Assistance includes information on all programs at the national level that are currently authorized regardless of whether the current year's budget includes funding for them through appropriations or allocations. Federal and state agencies that typically administer applicable funding programs include:

Federal

- U.S. Department of Homeland Security
  - Federal Emergency Management Agency
- U.S. Department of Transportation
  - Federal Highway Administration
  - Federal Transit Administration
  - Federal Railroad Administration
- U.S. Department of Commerce
  - Economic Development Administration
  - Small Business Administration (for private entities to restore improve access from the public roadway network)
- U.S. Army Corps of Engineers
- U.S. Department of Housing and Urban Development
  - Community Development Block Grant Program (this has been a means for the allocation of additional funds for disaster relief and recovery)

State

- Business Oregon
- Oregon Department of Administrative Services
- Oregon Office of Emergency Management
- Oregon Department of Transportation

An important pre-event activity is to create a catalog of these programs and maintain it by revisiting it periodically. This should include obtaining and organizing information on processes and procedures for reimbursement through each program, creating a matrix of key elements, and distributing this information and associated matrix to affected personnel.

POTENTIAL FUNDING & REIMBURSEMENT CHECKLIST	
ITEM #	**TASK/ACTION**
1. Federal & State Assistance Programs	a. Initiate e-mail/phone contact with Federal and State agencies from whom funding and assistance is expected to be sought. b. Meet with appropriate Federal and State agency staff to discuss funding opportunities and details on applying, recordkeeping, and reporting. c. Conduct a workshop(s) with City purchasing, project management, and construction management personnel to ensure all funding requirements are met to ensure reimbursement. d. Monitor progress and periodically internally audit application, recordkeeping, and reporting documentation to ensure adherence to funding agency procedures, processes, and formats. e. Based on meeting with appropriate Federal and State agency staff, develop a punch list for closing out of funding instruments (e.g., grants).

7. Follow-On Activities

The Portland Transportation Recovery Plan (the Plan) was submitted to the Advisory Committee and may be presented to and adopted by the Portland City Council.

Consistent with the City of Portland's 2016 Mitigation Action Plan, implementation of pre-event activities should begin at the earliest possible time and be completed within five years. The implementation and maintenance strategy developed by the MAP steering committee will guide this phase. Implementation is dependent on the commitment of all City bureaus, elected officials and Portlanders to reducing risk from natural hazards.

As noted from the outset, the type of incidents that may occur in the city and the extent and severity of them are uncertain. What is known is that, like other phases of emergency management, the ability to address the impacts of an incident effectively is dependent on good working relationships. A solid plan and clear course of action need proper execution and this comes from building familiarity and trust between bureaus and individuals that will be responsible for overseeing the transition from response to recovery to full restoration of community and economic functions.

Specific actions that should be undertaken include:

- Expand on the Plan to Create a More Robust Recovery Framework: Per Element #7, PBOT will coordinate the development of a broader infrastructure recovery framework and governance strategy. It is suggested that the Plan be revisited within the next five years and expanded upon based on changes in conditions and modeling and analysis capabilities. This identification of opportunities to strengthen and advance the strategies of the Plan will include review and comment by the members of the TRWG.
- Tabletop Exercises: The tabletop exercises used to develop the Plan were vital in not only vetting its contents and receiving feedback from the members of the TRWG but also for building relationships among agency staff in the context of recovery. Tabletop exercises should be conducted no less frequently than every two years. These incidents can serve as the foundation for identifying additional recovery strategies.
- ETR Updates: As noted in Chapter 2, the ETRs were adopted in 2006. A full review and update should be conducted at the earliest opportunity. While major modifications may not be necessary, it is important to ensure that changes in the city over the past decade are fully considered both in terms of new and/or improved transportation facilities (such as the new Sellwood Bridge or the Tilikum Crossing) and key public buildings that will be critical during emergency response and recovery. There are currently efforts by RDPO and Metro to facilitate a regional update in 2019.
- TriMet Coordinated Damage Assessment Plan: Coordinating assessments of damage to the public transportation system based on populations, businesses, and public resources served would benefit from the development of a document that identifies how this will occur, including coordination with the City government, neighborhood organizations, businesses, and not-for-profit agencies.
- Create the Framework for a Disaster Recovery Office: Determine the roles, responsibilities, structure, staffing, interagency agreements (e.g., memoranda of understanding, mutual aid agreements, etc.), and associated

resources required to activate, operate, and disband a disaster recovery office. The City should work with the RDPO to connect the office with the regional recovery framework being planned. Enact the enabling legislation to establish a Portland Disaster Recovery Office when deemed necessary. The creation of such an entity has been an important "lesson learned" from the Canterbury Earthquake Recovery Authority formed in New Zealand after the 2011 earthquake in Christchurch.

- Economic Impact Assessment: The potential disruption to the city's economy by the incidents described in Chapter 3 should be quantified via an assessment of direct, indirect, and induced impacts. This can serve the dual purposes of both making the case for needed investments in resiliency improvements prior to an incident and serving as the foundation of an expanded discussion on freight in future recovery efforts.
- Comprehensive City Recovery Plan: The City should consider developing an organizational structure and operating plan specific to this role. This would provide the TRWG with a clear understanding of how to proactively conduct the implementation of the Plan in accordance with the City's overall redevelopment strategy following an incident.
- Emerging Technologies: The City should work with regional partners to track emerging technologies in the transportation field, such as connected and autonomous vehicles, unmanned drones, and smart sensors and infrastructure, and determine how these could be used during recovery. The City should also invest in alternative fuel vehicles and infrastructure and support TriMet's use of electric buses. These vehicles could be import during disasters where diesel and gasoline are limited.
- Freight: The Plan focuses primarily on the movement of people during recovery. Transportation recovery planning for Portland should be expanded to incorporate the movement of goods. A freight and business stakeholder group assembled from the Portland Freight Committee and others should be established to understand their needs and challenges, allowing for the integration of goods movement activities into future recovery effrots. The assessment of marine- and rail-based goods movement capabilities should be assessed after an incident to determine capacity and prioritize repairs similar to the recommendations for highway, transit, bicycle, and pedestrian facilities and services in this version of the Plan.

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