Agenda

Metro
600 NE Grand Ave.
Portland, OR 97232-2736

Meeting: Transportation Policy Alternatives Committee (TPAC) and Metro Technical Advisory Committee (MTAC) Workshop
Date: Wednesday, November 7, 2018
Time: 10 a.m. – 12 p.m.
Place: Metro Regional Center, Council Chamber

Call To Order and Introductions

10:00 am **1.** **Public Communications On Agenda Items** — **Tom Kloster, Chair**

10:05 am **2.** * **Transportation Resiliency and Emergency Preparedness Efforts in the Region** — **Denise Barrett and Laura Hanson, Regional Disaster Preparedness Organization**

Purpose: Increase awareness of regional and local efforts related to emergency response and recovery and opportunities for future work and enhancing regional coordination and collaboration.

- RPDO Overview, Denise Barrett, RPDO Manager *https://rdpo.net* *https://rdpo.net/planning/* *https://rdpo.net/annual-report/* — **John MacArthur, Portland State University**
- Regional Recovery Framework and Work to Support Emergency Transportation Routes (ETR) Update, Laura Hanson, RPDO Regional Planning Coordinator *https://rdpo.net/regional-recovery-framework/* — **Jonna Papaefthimiou, Portland Bureau of Emergency Management**
- Portland Transportation Recovery Plan, John MacArthur, PSU Transportation Research and Education Center Researcher https://trec.pdx.edu/research/project/1185/
- Portland Resilient Infrastructure Planning Exercise (RIPE), Jonna Papaefthimiou, PBEM Planning, Policy, and Community Programs Manager *https://www.pdx.edu/sustainability/resilient-portland* — **Kim Ellis, Metro**
- 2018 Regional Transportation Plan and Regional ETR Update, Kim Ellis, Metro Principal Transportation Planner

Questions to consider related to transportation resilience and recovery:

- What is the role of cities and counties?
- What is the role of RPDO, state agencies and Metro?
- What opportunities exist for enhancing coordination and collaboration?

11:30 am **3.** **Accessory Dwelling Unit (ADU) Code Audit Work** — **Frankie Lewington, Metro**

Purpose: Provide an overview of the Build Small Coalition's ADU zoning code audit report and summarize next steps.

11:50 am **4.** **Discussion and Review of TPAC/MTAC Workshops – Looking Ahead to 2019** — **Tom Kloster, Chair**

Purpose: Review 2018 workshop format and discuss joint workshops for 2019.

12 p.m. **5.** **Adjourn** — **Tom Kloster, Chair**

Next TPAC/MTAC Workshop Meeting: Wed. Dec. 5, 2018

* Material will be emailed with meeting notice

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Metro

August 2016

600 NE Grand Ave.
Portland, OR 97232-2736
oregonmetro.gov

2018 TPAC/MTAC Workshop Work Program

As of 10/23/18

NOTE: *Items in* ***italics*** *are tentative*

December 5, 2018 Comments from the Chair: • **Agenda Items:** • Air Quality (AQ) Year in Review (Cho, 30 min) • Mobility for All (Winter and others TBD; 45 min) • Continuation Discussion of TPAC/MTAC Workshops – Next Steps 2019 (Kloster; 45 min)	

Parking Lot

- State of Vision Zero Within the Region (Lake McTighe)
- DEQ-PSU Diesel Monitoring Project
- Designing Livable Streets and Trails Update (Lake McTighe)

For agenda and schedule information, call Marie Miller at 503-797-1766. E-mail: marie.miller@oregonmetro.gov
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Meeting minutes

Metro
600 NE Grand Ave.
Portland, OR 97232-2736

Meeting: Transportation Policy Alternatives Committee (TPAC) and Metro Technical Advisory Committee (MTAC) Workshop

Date/time: Wednesday, Oct. 3, 2018 | 9:30 a.m. – 12 p.m.

Place: Metro Regional Center, Council chamber

Attending	**Affiliate**
Tom Kloster, Chair	Metro
Glenn Koehrsen	TPAC Community Member
Carol Chesarek	Multnomah County
Raymond Eck	Washington County Representative
Nancy Kraushaar	Clackamas County, City of Wilsonville
Eric Hesse	City of Portland
Todd Juhasz	City of Beaverton
Joanna Valencia	Multnomah County
Jon Makler	Oregon Department of Transportation
Marlee Schuld	City of Troutdale
Dr. Gerry Mildner	Portland State University
Denny Egner	City of Milwaukie
Emily Lai	TPAC Community Member
Colin Cooper	MTAC, City of Hillsboro
Bev Drottar	TPAC Community Member
Yi-Min Ha	Kittelson & Associates
Erika Palmer	MTAC, City of Sherwood
Anne Debbaut	DLCD
James Adkins	Home Builders Association of Metropolitan Portland
Brendon Haggerty	Multnomah County Public Health
Tom Armstrong	City of Portland
Mary Kyle McCurdy	1000 Friends of Oregon
Katherine Kelly	City of Gresham
Tyler Bump	City of Portland
Karen Buehrig	Clackamas County
Theresa Cherniak	Washington County
Paul Grove	Home Builders Association of Metropolitan Portland
Anna Slatinsky	City of Beaverton
Kelly Betteridge	TriMet
Jae Douglas	Multnomah County Public Health
Jeannine Rustad	Tualatin Hills Park & Recreation District
Dave Unsworth	TriMet

Metro Staff

Malu Wilkinson, Investment Areas Manager
Ted Leybold, Planning Manager
Eliot Rose, Senior Tech & Transportation Planner
Chris Ford, Principal Regional Planner
Jamie Snook, Principal Transportation Planner
Marie Miller, TPAC Recorder

1. Call to Order and Introductions

Chair Tom Kloster called the workshop meeting to order at 9:30 a.m. Introductions were made.

2. **Comments from the Chair and Committee Members**
    - **TPAC Community Member Recruitment (Marie Miller)** Ms. Miller announced the open recruitment for TPAC Community members, to be appointed by Metro Council for 2-year terms. There are currently 3 positions open that begin January 2019. Applications are available online and will be accepted until October 23. Asked what qualifications and expertise is most encouraged for applications, Chair Kloster explained what the process entailed for application, interviews and appointments. For more information committee members were encouraged to reach Ms. Miller or Chairman Kloster, and help spread word to their communities.
    - Dr. Gerry Mildner commented on materials received from the workshop packet regarding proposed Accessory Development Units (ADUs). More economic costs and implications from these developments may be needed beyond what the current study shows. More information on this was presented during the workshop.
    - Raymond Eck commented on the letter from the Audubon Society regarding their concern with the I-5 and Rose Quarter transportation projects listed in the RTP. The clarification for this concerning RTP consideration through policy committees and Metro Council stems from project lists in corridor planning and state funding already allocated to designated projects.

3. **Public Communications on Agenda Items** – none

4. **SW Corridor Light Rail Preferred Alternative (Chris Ford, Metro/Dave Unsworth, TriMet)**

Mr. Ford provided an update of the SW Corridor Light Rail Preferred Alternative project. A map was referenced of the Regional High Capacity Transit (HCT) System Plan identified in the RTP and another map indicating where the project fits into the existing HCT network of MAX and WES trains. Mr. Ford reminded the committee this project is intended to help address expected future growth in the region, the concept adopted with HCT plans adopted in 2019, in the 2018 RTP, with priority on corridors for HCT.

Metro growth projects 340,000 residents in the Southwest Corridor by year 2015; an added growth of 70,000 people from today. This expected growth impacts not only commutes within the corridor region, but outside the area for work, housing, education and daily living travel. Prediction of 13-17 hours of congestion daily on I-5 between Portland and Tigard in 2015; it was noted this project will not eliminate congestion but provide travel options to lessen impact.

The study started with land use to connect critical places for context with growth, evaluating over 60 alignment options for consideration. Project partners for the study included TriMet, City of Portland, Metro, Tigard, Sherwood, Tualatin, ODOT, King City and Beaverton. As the project plan unfolded, major decisions included evaluation of tunnels, Bus Rapid Transit (BRT) and light rail. However, more than light rail is included in the project:

- New walk and bike connector between Barbur and Marquam Hill (OHSU/Veterans Administration and more major industries)
- 2-mile shared transit-way to allow buses to bypass traffic congestion
- Shuttle between PCC-Sylvania and nearby stations
- Continuous sidewalks and protected bike lanes where light rail transit is in Barbur

The benefits and impacts from an investment like light rail has not always been equitably felt by those in the region. To help address this, Metro has partnered with others on housing grants, strategies and the upcoming housing bond measure. In addition, the SW Equitable Development Strategy, supported by a

grant from FTA, is addressing housing issues, workforce development to help create livable wages, and six pilot programs for housing and workforce opportunities.

Comments from the committee:

- Emily Lai asked what the amount of funding for the pilot project was, and how this was being allocated. Mr. Ford stated the amount for pilot grant funding was $275,000 to be spent by next summer, 2019. Evaluations were performed on 11 applications received, with six grants awarded. With a question on financial resources toward staffing projects and how displacement of homes/properties with the light rail project was affecting in the long-term range plan, Mr. Ford reported that Metro's housing bond measure had strategies in place addressing these issues. In addition, there is a constitutional amendment under consideration requiring project development for affordable housing, with further options for funding through regional partners.

Dave Unsworth, Director of Project Development & Permitting, TriMet, noted the project would provide 43,000 riders on average weekdays in 2035. This equates to 1 in 5 commuters southbound I-5 during rush hour from downtown Portland to Tigard and Tualatin.

The project is undergoing Environmental Review to become eligible for federal funds. The public review period on the Draft Environmental Impact Statement received over 1,000 comments. This led to the recommendation by the SW Corridor Steering committee on a preferred alternative chosen based on purpose and need, public and agency input, and FTA rating criteria. The alignment of the line was discussed. Considerations given included Barbur Blvd., Marquam Hill connections, and Tigard/Tualatin connections.

Comments from the committee:

- Denny Egner asked why the line stopped at Bridgeport and not finish in Tualatin. Mr. Ford explained cost considerations and environmental impacts with crossing the river detracted from this idea.
- Nancy Kraushaar commented on unsafe bike lanes between Tualatin and Bridgeport. Were other bike/ped lanes planned for improvements? Mr. Ford reported that station access improvements with Tualatin were considered, but would need other funding sources yet to be determined. A separate bridge was considered too costly when considered. Mr. Unsworth added that partnerships were possible on other bike/ped lanes outside this project.
- Carol Chesarek commented on the lack of Park & Ride space at the Sunset transit station. What plans are being made for adequate parking with this line? Mr. Unsworth listed the Park & Ride locations under consideration with the plan, but acknowledged that not enough space would permanently fill needs. Considerations planning for the future included mobility huts, Automated Vehicles (AVs), and shuttles. Currently it costs $50,000 per single Park & Ride space, with decisions to be made balancing costs and future space needed.
- Theresa Chernaik asked if elevations with transit structures was considered to address congestion. Mr. Unsworth reported that for now structures were not being planned for changes, but some removal of stations to increase speed between downtown Portland south was planned. Consideration of replacing the Steel Bridge or placing a tunnel below has been given. There are also environmental concerns with grades to lanes leading to the committee preferring the project going further south.
- Collin Cooper asked for the reasoning with the Barbur Transit Station placements. Mr. Unsworth reported this was based on the study of the Barbur concept plan. Considerations that lead to this being the preferred transit stations in the plan were travel time, liability, affordable housing, accessibility,

reliability/speed, and development/housing. Asked what the relationship between ridership on different lines in the region, this varies on if light rail plays a mix for service and the challenge predicting reliability of time on I-5. More study will be done on the concept of the west as its own corridor. Light rail replacements help on time, with connections between light rail and buses serving Tigard for current needs.

- Emily Lai asked how other states are able to fund projects like this with future sustainability. Mr. Unsworth reported that state sales taxes provided revenue that Oregon does not, requiring us to utilize our resources carefully and work with communities on strategies. Asked how we addressed vacant housing along transit corridors for equitable development, Metro Council and regulations apply to prevent acquisition for these purposes.
- Dr. Gerry Mildner asked if the bridge over Highway 217 was being designed for multi-modal traffic. Mr. Unsworth stated this was not in the budget for the project, but could possibly be developed with a bike-ped lane with Tigard planning.
- Collin Cooper commented on the goal of having 20-minute neighborhood commutes, but with TriMet such a complex system, this wasn't the reality. Choices for equitable transit travel with reliability is challenging. Agreement on this from the committee, noting that federal funding 50% partnership on transit projects with less resources, working from aging systems, limitations of single tracks, and commitment to ongoing and proposed projects makes it challenging.
- Emily Lai commented on utilizing further efforts to create designs and strategies outside bonds proposed by Metro, and working with others early on to think outside the box.

Mr. Ford concluded the presentation with the project schedule. In Nov. 2018 Metro Council will consider adding the final preferred route to the RTP, weighing input from local jurisdictions. In 2019, TriMet takes the lead with a new steering committee and advancing designs, and will work with Metro to complete environmental review and identify funding strategies. Following a proposed regional funding measure in 2020, the project would work to acquire federal matching funds in 2022, with the light rail opening in 2027.

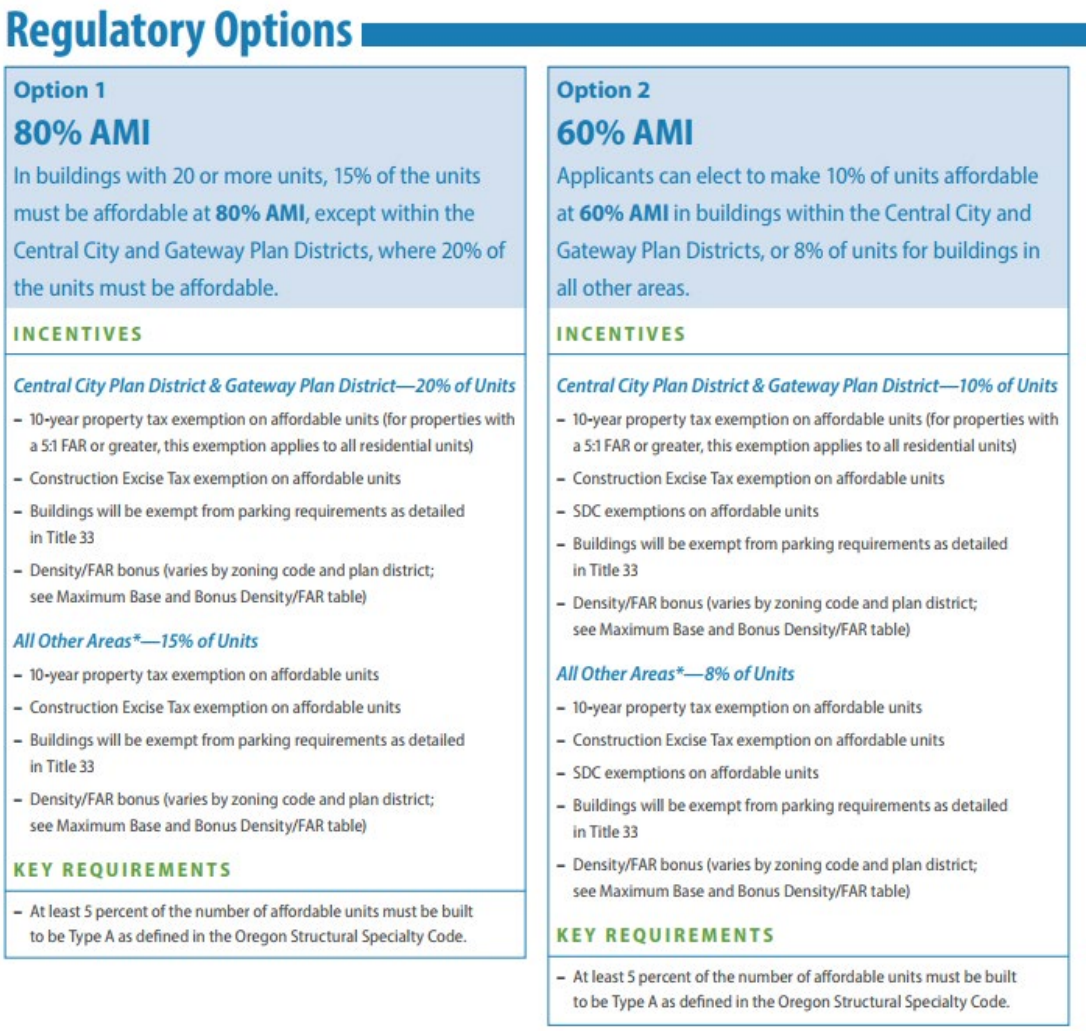
5. Portland Housing Strategy (Tom Armstrong/Tyler Bump, City of Portland)

Tom Armstrong and Tyler Bump with the City of Portland Bureau of Planning and Sustainability provided an overview of housing issues and residential zoning projects in process. Homes sales by affordability shown from 2000 to 2017 displays the high degree in loss of affordable homes to average households in Portland. Dynamics driving this trend includes increase in educated households, 25% increase in jobs, which has resulted in Portland having the 10th highest median household income in the country, ahead of New York and Los Angeles.

Housing development in Portland has increased from 4,000 units per year in 2015 to 7,000 units in 2017. A graph of housing types shows the majority of units are multi-family, with single-family units relatively flat as greenfield sites in Portland are scarce. Since 2011, Portland has seen an increase in Accessory Dwelling Units (ADU). Asked if the change in county tax assessments on ADUs have had, there is no indication that is has had an impact on permit for ADUs.

Mr. Bump provided an overview of the Inclusionary Housing program, designed to help meet the need for a minimum of 23,000 additional housing units to serve low and moderate income households, working to preserve economically diverse neighborhoods and housing affordability. Inclusionary Housing requires that all new residential buildings with 20 or more units provide a percentage of the new units at rents affordable to households at 80% of the median family income (MFI). The City of

Portland has defined additional regulatory options under the umbrella of this requirement. Permit applications must include one of the options to provide affordable housing in their proposal, or applicants can opt to pay a fee-in lieu at permit issuance.



Maximum Monthly Rent Considered Affordable

Bedroom	30% MFI	60% MFI	80% MFI
0	$392	$855	$1,140
1	$458	$916	$1,222
2	$549	$1,099	$1,466
3	$635	$1,270	$1,694
4	$708	$1,417	$1,890
5	$781	$1,563	$2,085

The above table provided by HUD, updated annually, adjusted per region.

Theresa Cherniak asked how long was the rate required to maintain affordability. The Portland Housing Bureau requires 99 years of affordability to comply with the program. To ensure this requirement, they have a compliance team that reports and monitors the program and permits. From March 2016 to Feb. 1, 2017, development applications for 19,000 units were placed in the pipeline before the Inclusionary Housing program took effect. There are now 8,600 still in the pipeline, which will take 4-5 years before

these applications are all considered. Affordability housing in Portland will be a rolling issue, as will comparisons to other parts in the region for years to come.

Comments from the committee:

- Theresa Cherniak asked how Inclusionary Housing are distributed, and how both renters and landlords know if a tenant is qualified. What type of marketing is done for this program? The City of Portland's Housing Bureau provides the outreach and engagement for the program. Property managements, landlords, and developers are required to report on income with renters to qualify and track this program.
- Emily Lai asked how the allocation of these units could be provided to the more vulnerable low-income for rent. Mr. Bump explained this was one component of the city's affordable housing programs. Resources are being leveraged directly for mixed use development with residential housing, among which are affordable rent. Property tax, CET and exemption waivers help offset costs to developers for these units. Lost revenues to these have not been calculated as yet.
- Nancy Kraushaar asked if the SDC waivers are popular, was there a concern of shortage on this development and losing capital investments. It was explained that SDC in the agreements are only on affordable units, meant to provide a balance with development.
- Following graphics of pre-IH Vested Projects and Units, and Post-IH Permit Activity, Dr. Gerry Mildner asked how soon in the process were the 8,000 applicants as of July 2018, moving to post-permit activity. Mr. Armstrong reported that they'd continue to monitor, with several variables to watch for, among them interest rates, construction costs, the timeline in the permit schedules and land use applications for consideration.
- Paul Grove asked that there seemed to be a great deal of attention to the central city areas with the projects, but a different dynamic on development across the region could show a different projection and result for development. Mr. Bump agreed that relooks at growth projections and incentives across the city will be reviewed for housing mix in the future.

A spectrum of residential zones have been designed for Portland that include the Residential Infill Project for single dwelling zones, and the Better Housing by Design project for multi-dwelling zones. The Residential Infill Project takes a fresh look at the rules governing the types of housing allowed in our neighborhoods. This proposal would allow more housing units to be built in residential neighborhoods but only if they follow new limits on the size of new buildings. Single dwelling makes up 40% of land area, with the challenge to better utilize this efficiently.

To address the issue of new houses that are out of character with existing houses, Portland proposes to limit the size of houses with a floor to area ratio standard. The floor to area ratios will varying depending on what the housing types, which will be expanded from single-houses and duplexes to include additional ADUs, triplexes and (maybe) four-plexes. Portland is also exploring a visitability requirement, when there are three units or more, at least one unit is required to be "Visitable":

- No-step entry
- Bathroom and halls with wider doors
- Area to socialize

The additional housing options overlay zone will apply to most residential areas, shown on a map to the committee. Some areas where it would not apply are the Johnson Creek planning district with environmental issues, and displacement risk areas. At the end of this year the decision is expected to proceed for review of the draft proposal, with the recommended draft at City Council in early spring 2019.

Comments from the committee:

- Paul Grove asked if there would be a reworked/revised economic analysis recently reported by Jerry Johnson. This was expected in the next month or so.
- Carol Chesarek asked why areas prone to landslides and steep slopes allowed consideration with these new building zones. The decision was made after much discussion to look at a mix of housing not limited for choice. Ms. Chesarek noted it will be hard to reach some houses in these areas after disasters.
- Dr. Gerry Mildner asked if the analysis by Jerry Johnson came before the study now being discussed. It was agreed that a higher output in the housing units would increase from the updated analysis. Redevelopment proposed did not factor in additional units.

With a 2040 grant, the Better Housing by Design project is revising development and design standards in Portland's multi-dwelling residential zones outside the Central City. These middle-and higher density zones provide opportunities for new housing to meet the needs of current and future residents. Elements include diverse housing options and affordability, outdoor spaces and green elements, building design and scale to pedestrian friendly streets, and east Portland standards and street connections.

The new framework for the multi-dwelling zones include four zones that are based on existing zones, but are more responsive to different types of places. The Bonus FAR is provided for projects with affordable housing or FAR transfers from sites where historic buildings, existing affordable housing or trees are being preserved. Mr. Armstrong noted that at this time next year, up-zoned residential development in the city will have taken place.

Comments from the committee:

- Nancy Kraushaar asked if this applies to redeveloping existing buildings. That was confirmed, 50-60% of Portland's multi-family zoning has existing single family houses that are expected to be redeveloped to multi-family housing.
- Carol Chesarek asked if incentives to preserve trees was new. The incentives for preserving existing affordable housing and trees comes through transfers of development rights. They are looking to expand this areas.
- Anna Slatinsky asked if it was possible to layer bonuses on top of the Inclusionary Housing bonus. No, since the calculated base and bonus is near the maximum building space (lot coverage and building height) allowed.
- Theresa Cherniak commented on the different approach based on floor to area ratios, which could be duplicated in other areas of the region. Mr. Armstrong agreed, adding that this was a form-based code approach rather than counts of units. We can't control the number of people in units, but focus on sizes of buildings. With a question on transit structure and parking, Mr. Armstrong reported they focused on the distance to transit as the key to regulating the minimum number of parking spaces.
- Dr. Gerry Mildner recommended adding a footnote to the statement that up-zoning all residential areas of the city will produce more housing. Some neighborhoods may not absorb this zoning or have the economic capacity. ADUs have a lower value with smaller size area. Mr. Armstrong said it might be debatable. Opportunities for providing creativity in development, future demographics in the region and population needs, and market demand will affect housing choices.

- Paul Grove asked if garages were counted in the plan. There are allowances for accessory structures. Narrow lots were at one time taken out of consideration in the proposal, but are back in. Mr. Grove commented on the 3-year process with the project, and recommended that with the RFA established and project planned, it would be beneficial to have a review and look back with updates at a later time.

6. Metro Emerging Technology Strategy PILOT Program (Eliot Rose, Metro)

Eliot Rose provided an overview of the Emerging Technology Strategy Partnerships and Innovative Learning Opportunities in Transportation (PILOT) program. A handout on the program was noted in the packet. Mr. Rose explained that the PILOT program was a near-term implementation action identified in the Emerging Technology Strategy designed to provide information and develop partnerships to help Metro and its partners guide innovation toward advancing equity and improving travel options. Technology pilots can be a more cost-effective way to learn about Emerging Technologies than research or planning studies, and they are an important tool to understand how emerging technologies impact equity. The goals of the PILOT program are: Goal 1: Test; Goal 2: Collect information; Goal 3: Develop partnerships.

Following preliminary conversations with over 50 organizations potentially interested in launching a pilot, and research on pilot projects and funding programs in other U.S. communities, Metro defined successful PILOT projects as those that:

- Address a well-understood, clearly-defined challenge
- Test an innovative solution that supports regional goals
- Conduct outreach and education to help community members make the most of this solution
- Create new partnerships across sections
- Develop and share information on successes and challenges
- Leverage additional resources

Total funding available for the PILOT program is $150,000. The amount applicants are allowed to request: $25,000 – $150,000. Teams consisting of public agencies, non-profits, and/or private companies are eligible to apply. The grant period is for two years, from July 2019 through June 2021.

Following an overview of the selection process, Mr. Rose highlighted two key upcoming dates:

- October 5, 3-6 p.m. Kickoff event at the Lucky Lab in NW Portland, where people can share interest in project ideas and network with potential partners.
- Sept. 28 – Oct. 26 Call for Letters of Interest. Encouragement is given to submit a brief letter describing your project idea. Metro staff will offer feedback and potentially technical assistance with the application process based on letters of interest.

Comments from the committee:

- Glenn Koehrsen asked if consideration has been given to scalability, with projects applicable to larger and different areas of the region. Mr. Rose commented that they would be looking into this idea as part of developing the program. Considerations would be given to resources available, the scope of the project, and interest from others in developing the program. Letters of interest will help Metro form more detailed thoughts on this subject.
- Carol Chesarek asked if noise and space limitations at the Lucky Lab Kickoff event might prevent attendance, and options to find this information. Mr. Rose reported that information would be available on the website, and updated following the kickoff event. Plans for the event include presentations, structured network time with a national presenter on the PILOT programs, A

networking activity facilitated by Metro staff, and an open networking social time toward the end. A debrief from the event will follow via email.

7. Adjourn

There being no further business, workshop meeting was adjourned by Chair Kloster at 12 p.m.
Meeting minutes submitted by,
Marie Miller
TPAC Recorder

Attachments to the Public Record, TPAC and MTAC Workshop meeting, Oct. 3, 2018

Item	Document Type	Document Date	Document Description	Document No.
1	Agenda	10/3/2018	October 3, 2018 TPAC/MTAC Workshop Agenda	100318T-01
2	Work Program	9/26/2018	2018 Combined TPAC/MTAC Workshop Work Program	100318T-02
3	Meeting Minutes	8/29/2018	Meeting minutes from August 29, 2018 TPAC/MTAC Workshop meeting	100318T-03
4	Memo	Sept. 24, 2018	To: TPAC/MTAC and interested parties From: Marie Miller, TPAC recorder RE: TPAC community member recruitment and appointments for new terms on committee	100318T-04
5	Handout	N/A	Southwest Corridor Light Rail Project; Steering Committee Preferred Alternative Report	100318T-05
6	Newsletter	Fall 2018	SW Corridor Light Rail Project: What's next for light rail?	100318T-06
7	Handout	April 2018	Residential Infill Project Summary: Proposed Draft	100318T-07
8	Handout	May 2018	Better Housing by Design – Proposed Draft Summary	100318T-08
9	Handout	N/A	Metro Partnerships & Innovative Learning Opportunities in Transportation (PILOT) Program	100318T-09
10	Handout	June 2017	Inclusionary Housing	100318T-10
11	Presentation	10/3/2018	SW Corridor Light Rail Preferred Alternative	100318T-11
12	Presentation	10/3/2018	City of Portland Housing Issues	100318T-12
13	Presentation	10/3/2018	PILOT program overview	100318T-13

Regional Disaster Preparedness Organization

The Regional Disaster Preparedness Organization (RDPO) is a partnership of government agencies, non-governmental organizations, and private-sector stakeholders in the Portland Metropolitan Region collaborating to increase the region's resiliency to disasters. The metropolitan region spans Clackamas, Columbia, Multnomah, and Washington Counties in Oregon and Clark County in Washington.

The RDPO formed out of a desire to build upon and unify various regional preparedness efforts in the Portland Metropolitan Region, including the Regional Emergency Management Group established in 1993, the Urban Areas Security Initiative Program originally funded in 2003, and several discipline-specific coordination groups. The RDPO was formalized in January 2015 through an intergovernmental agreement.

Mission of the RDPO

The mission of the RDPO is to build and maintain regional disaster prevention, protection, response, mitigation, and recovery capabilities in the Portland Metropolitan Region through strategic and coordinated planning, training and exercising, and investment in technology and specialized equipment.

Vision of the RDPO

The vision of the RDPO is to create a secure and disaster-resilient region in which local agencies, organizations, and communities are coordinated and prepared to prevent, protect against, mitigate, respond to, and recover from threats and hazards of great risk to the Portland Metropolitan Region.

RDPO

Regional Disaster Preparedness Organization

Unified. Prepared. Resilient.

9911 SE Bush Street, Portland, OR 97266
Phone (503) 823-5386, Fax (503) 823-3903
rdpo@portlandoregon.gov
www.RDPO.org

Effective Regional Coordination

Natural disasters, acts of terrorism, and other emergency incidents can affect multiple jurisdictions simultaneously. Major disasters such as earthquakes create large-scale impacts that require outside assistance even for the most prepared local public safety organization.

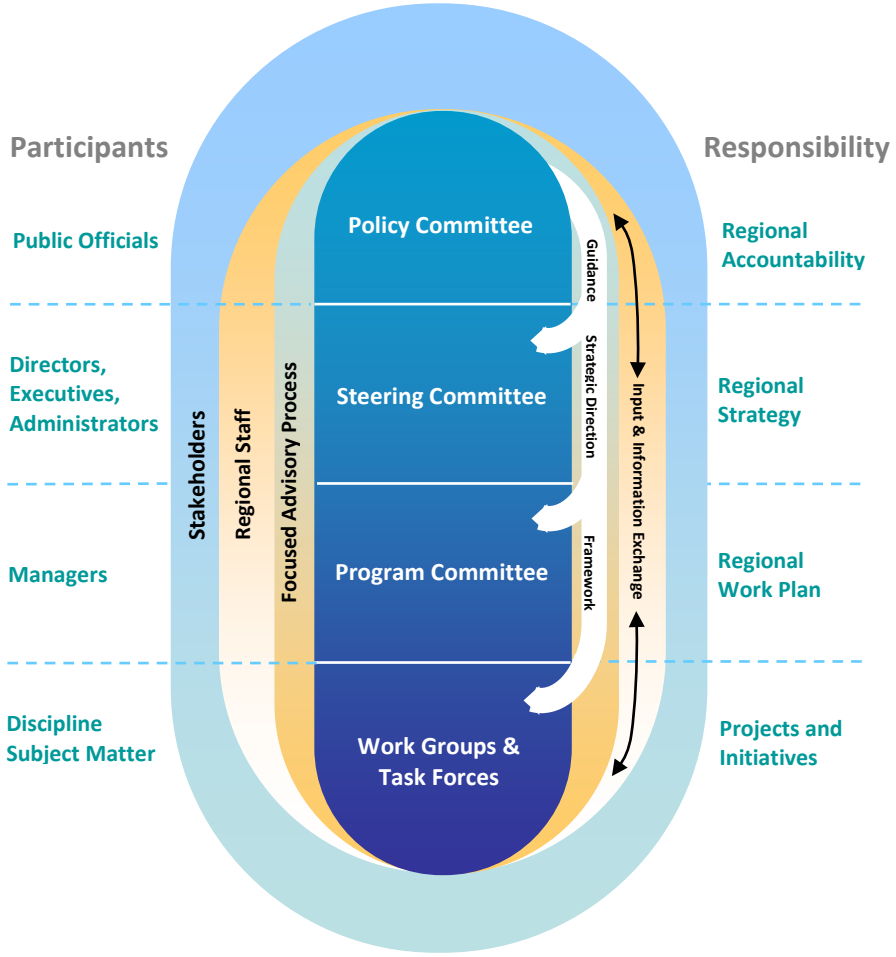
The cities, counties, non-governmental organizations, and private-sector stakeholders in the region recognize that they all can more effectively respond to emergencies and facilitate recovery of communities if they prepare together. Regional collaboration in building disaster preparedness capabilities is more cost-effective for taxpayers, develops roles and relationships needed for efficient disaster response and recovery, and increases the ability to involve the whole community in preparedness initiatives.

Guiding Principles

- Provide opportunities for all jurisdictions and disaster preparedness organizations in the five-county region to participate
- Strive for a holistic regional perspective while honoring and respecting each partner's autonomy
- Demonstrate organizational value to all members
- Practice transparency, accountability, and financial stewardship
- Ensure equity and fairness in adopting regional policies
- Make decisions by consensus whenever possible
- Use a whole community approach in which all stakeholder groups are integrated and considered
- Build upon existing strengths and ensure capability investments are maintained
- Use the National Preparedness Goal as a guide for enhancing regional preparedness across all mission areas

Membership and Organizational Structure

RDPO membership is open to all jurisdictions, non-governmental organizations, and private-sector businesses that have a role in building disaster preparedness capabilities in the Portland Metropolitan Region. There are two types of membership in the RDPO (contributing and non-contributing), which is spelled out in the RDPO Intergovernmental Agreement. The work of the RDPO is conducted and coordinated through a well-defined structure of committees and work groups, including Policy, Steering and Program Committees, discipline-specific work groups, standing committees, and cross-discipline task forces.



Current Membership and Funding

Policy Committee Members (15)

Chair - Councilor Karylinn Echols, City of Gresham
Vice Chair - Commissioner Jim Bernard, Clackamas County
Councilor Kyle Allen, City of Hillsboro
Councilor Rich Allen, City of Troutdale
Councilor Cate Arnold, City of Beaverton
Marla Blagg, TriMet
Cathi Forsythe, City of Fairview
COO Vince Granato, Port of Portland
Councilor Kathryn Harrington, Metro
Commissioner Margaret Magruder, Columbia County
Mayor Anne McEnerny-Ogle, City of Vancouver
Commissioner Sharon Meieran, Multnomah County
Commissioner Dan Saltzman, City of Portland
Commissioner Dick Schouten, Washington County
Councilor Jeanne Stewart, Clark County

RDPO Funding

Current funding for the RDPO comes from the Department of Homeland Security Urban Areas Security Initiative (UASI) Grant Program and RDPO Contributing Members:

1. UASI FY'15 $3 million / 25 projects
2. UASI FY'16 $2.8 million / 14 projects
3. UASI FY'17 $2.8 million / 17 projects
4. UASI FY'18 $2.5 million / 17 projects
5. Core Group Contributions to RDPO Operations/Administration (FY'18-19): $203,500
6. Contributing Member Contributions to Projects (FY'18-19): $60,743

The Portland Bureau of Emergency Management serves as the Lead Administrative Agency for the RDPO and the fiscal agent for UASI grant funds and partner contributions.

Steering Committee Members (26)

Chair - Chris Voss, Multnomah Co. Representative (Rep.) and Past Vice Chair
Vice Chair - Mike Mumaw, Emergency Management Rep. and Past Chair
Jerry Allen, City of Beaverton Rep.
Christina Baumann, Public Health Rep.
Roy Brower, Metro Representative
Tammy Bryan, City of Hillsboro
Nancy Bush, Clackamas Co. Rep. and Past Chair
Fred Charlton, Fire/EMS Representative
Bob Cozzie, Public Safety Communications Representative and Past Chair
Jason Gates, Law Enforcement Rep.
Rebecca Geisen, Regional Water Providers Consortium Representative
Jay Jewess, Private Sector (Utilities) Rep. (PGE)
Scott Johnson, Clark County Representative
Gene Juve, City of Vancouver Representative
Scott Lewis, City of Gresham Rep.
Martin Montalvo, Public Works Rep.
Chris Neal, Port of Portland Rep.
Courtney Patterson, City of Portland Rep.
Steve Pegram, Columbia County Rep.
Scott Porter, Washington Co. Rep. & Past Chair
Kathryn Richer, Health System Representative
Tripp Robinson, Private Sector (Industry) Representative (Intel Corp.)
Cara Sloman, NGO Representative
Alex Ubiadas, Jr. Program Committee Chair
Paul Vang, TriMet Representative
Ray Young, City of Troutdale Representative

Signatories to the RDPO Intergovernmental Agreement & FY'18-19 Contributions:

Contributions are distributed by a formula based on jurisdictional population.

Core Group Members

(Contributions Range from $3,280-51,000)

- Clackamas, Columbia, Clark County, Multnomah, and Washington Counties
- City of Portland
- Port of Portland
- Metro
- TriMet

Other Members

(Contributions Range from $3,200-14,000)

- Cities of Beaverton, Fairview, Gresham, Hillsboro, Troutdale, and Vancouver

Non-Contributing Members

- Cities of Wood Village and Columbia City
- Clatskanie Rural Fire District
- Scappoose Rural Fire District
- Columbia 9-1-1 Communications District
- Regional Water Providers Consortium

Dozens more jurisdictions and public, private, and non-profit agencies participate on RDPO committees, work groups and project task forces. They are not formal RDPO members but have a stake in our region's preparedness.

Policy Committee

The Policy Committee (PC) is the governing body of the RDPO and is comprised of elected officials and chief executive officers from Participating Jurisdictions and other member organizations. This committee is responsible for providing political leadership to develop and promote a unified regional vision and strategy for disaster preparedness and to establish and operate a sustainable regional disaster preparedness organization.

Steering Committee

The Steering Committee (SC) is comprised of senior executives from Participating Jurisdictions and other member organizations and includes both organizational and discipline-specific representatives. The SC is responsible for developing and updating the regional strategy and associated priorities for regional disaster preparedness. The SC also endorses the RDPO work plan and funding plan developed by the Program Committee and provides oversight to the Program Committee in the implementation of the plans. The RDPO Manager reports to and is guided by the SC.

Program Committee

The Program Committee (PrC) is comprised of the chairs of the RDPO's Discipline Work Groups (DWGs), and a separate chair and vice chair drawn from the DWGs and elected by the Committee. The PrC's primary responsibility is to develop and monitor the performance of the annual work plan and associated funding plan that operationalizes the regional strategy.

Grants and Finance Committee

The Grants and Finance Committee (GFC) oversees use of grants and other funding sources in implementing regional projects to ensure transparency, accountability, and financial stewardship. The Grants and Finance Committee (GFC) is comprised of financial staff from Participating Jurisdictions and other member organizations.

Work Groups and Task Forces

The Work Groups bring together local agency, private-sector, and non-governmental organization representatives from the region who work in discipline areas that are highly involved in disaster preparedness. Each Work Group focuses on a discipline or functional area, determines its own members, and works to implement a self-produced annual Work Plan that supports the goals of the regional strategy.

Task Forces are created by the Program Committee (and sometimes the PC or SC) when there are projects that require collaboration among several of the Work Groups, e.g. disaster debris management planning. Task Forces are time limited and membership is determined based on specific project needs.

RDPO Staff

The RDPO is supported by a small team of staff managed by the RDPO Manager. Based at the Portland Bureau of Emergency Management, they provide administrative and technical assistance for organizational development and planning, project implementation, and grant management.

Lead Administrative Agency (LAA)

The LAA supports the organization's personnel, administrative, and fiscal operations. The City of Portland currently serves as the RDPO LAA.

Work Groups, Standing Committees and Task Forces:

- Animal MAC Group
- Citizen Corps Work Group
- Emergency Management Work Group (REMTEC) and the following Standing Committees:
  - Regional EOC Training
  - Regional Hazard Mitigation and Recovery Planning
  - Resource Management
  - WebEOC Regional Users
- Fire and Emergency Medical Services Work Group
- Law Enforcement Work Group
- NW Oregon Health Preparedness Organization (Health System WG)
- Public Health Work Group
- Public Information Officers Work Group
- Public Safety Communications WG / Portland Dispatch Center Consortium
- Public Works Work Group
- Regional Disaster Debris Management Planning Task Force
- Regional Disaster Preparedness Messaging Task Force
- Regional Disaster Sanitation Task Force
- Regional Mass Shelter Task Force
- Regional Multi-Agency Coordination System (RMACS) Advisors Group
- Transit Work Group

2017-2021 STRATEGIC PLAN/PORTLAND HOMELAND SECURITY STRATEGY

Towards a More Resilient Portland Metropolitan Region

OVERVIEW

The following strategic plan was developed through a participatory process that engaged the entire RDPO structure. The plan supersedes the RDPO's 2014-2016 Strategic Priorities document and the 2011 Revised Portland Urban Area Homeland Security Strategy. It contains the new set of goals and objectives guiding the RDPO over the next five years. Assessment data that contributed to the development of the strategic goals and objectives and the RDPO 2017-2018 Work Plan are associated standalone documents available on the RDPO.org website.

RDPO
Regional Disaster Preparedness Organization
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<---------- 5 National Mission Areas ---------->				
Prevention	**Protection**	**Mitigation**	**Response**	**Recovery**
<---------- Core Capabilities ---------->				
Planning				
Public Information and Warning				
Operational Coordination				
Intelligence and Information Sharing		Community Resilience	Infrastructure Systems	
Screening, Search, and Detection		Long-term Vulnerability Reduction	Critical Transportation	Economic Recovery
Interdiction and Disruption		Risk and Disaster Resilience Assessment	Env. Response, Health and Safety	Housing
Forensics and Attribution	Access Control and Identity Verification	Threats and Hazard Identification	Fatality Management Services	Health and Social Services
	Cybersecurity		Fire Management and Suppression	Natural and Cultural Resources
	Physical Protective Measures		Logistics and Supply Chain Management	
	Risk Management for Protection Programs and Activities		Mass Care Services	
			Mass Search and Rescue Operations	
	Supply Chain Integrity and Security		On-scene Security and Protection	
			Operational Communications	
			Public Health and Medical Services	
			Situational Assessment	

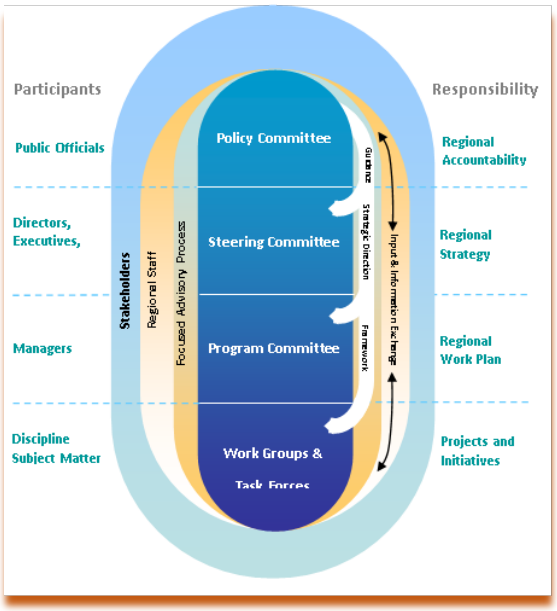
Figure 1: The National Preparedness Framework above guides the RDPO's strategic priorities. The framework contains five mission areas and 32 Core Capabilities (or competencies). The 2017-2021 Strategic Goals and Objectives finds the RDPO working in all five mission areas and in support of building/enhancing/maintaining around 25 of the Core Capabilities, with new work in the Recovery Mission area (e.g., pre-disaster recovery planning).

Figure 2: The RDPO's preparedness cycle is reflected above.

RDPO 2017 – 2021 Strategic Plan

I. Mission and Structure

The Regional Disaster Preparedness Organization (RDPO) is a partnership of government agencies and private and non-profit organizations in the Portland Metropolitan Region (PMR) working together to build and maintain regional all-hazards disaster preparedness capabilities through coordinated planning, training and exercising, and investment in technology and specialized equipment. It operates in a geographic region that encompasses Clackamas, Columbia, Multnomah and Washington Counties in Oregon, and Clark County in Washington.



The work of the RDPO is conducted and coordinated through a well-defined structure of committees and work groups, including Policy, Steering and Program Committees, discipline-specific work groups, standing committees, and cross-discipline task forces. For the purposes of Urban Areas Security Initiative Grant Program, the entire RDPO structure is the Urban Area Work Group (UAWG).

II. Vision

The vision of the RDPO is to create a secure and disaster-resilient region in which local agencies, organizations, and communities are coordinated and prepared to prevent, protect against, mitigate, respond to, and recover from threats and hazards of great risk to the Portland Metropolitan Region.

III. Principles

The RDPO is based on a set of nine principles:

- Provide opportunities for all jurisdictions and disaster preparedness organizations in the five-county region to participate.
- Strive for a holistic regional perspective while honoring and respecting each partner's autonomy.
- Demonstrate organizational value to all members.
- Strive for transparency, accountability, and financial stewardship.
- Ensure equity and fairness in adopting regional policies and making investments.
- Make decisions by consensus whenever possible.
- Use a whole community approach in which all stakeholder groups are integrated and considered.
- Build upon existing strengths and ensure capability investments are maintained.
- Use the National Preparedness Goal/Framework as a guide for enhancing regional preparedness across all mission areas.

IV. Assessment Data

The goals and objectives in the RDPO's 2017-2021 Strategic Plan are based on the combination of an external trends scan and an identification and assessment of organizational and program challenges, opportunities, and gaps and maintenance needs across the core capabilities in the RDPO's five mission areas: Prevention, Protection, Mitigation, Response and Recovery. To generate the data, the RDPO reviewed its annual Threat and Hazard Identification and Risk Assessment (THIRA) 2015 Update, exercise after-action reports (e.g., local and FEMA Region X Cascadia Rising Exercise AARs), State and National Preparedness Reports, post-disaster case studies and other research. Subject matter experts at all levels of the organization were also asked to contribute their insights.

Note: for a complete matrix of the assessment data that contributed to setting the goals and objectives, please refer to Annex A. Here's are a few items of note:

Trends/Challenges/Opportunities

- The July 20, 2015 *New Yorker* article, "The Really Big One", has brought the Cascadia Subduction Zone Earthquake and other large-scale disasters to the forefront of public discussion in our region and beyond, driving public demand for preparedness guidance (i.e., community outreach and messaging), as well as opportunities to gain skills to support community response. Oil train disasters and lone shooter events are also on the rise in the U.S., and have affected our own region in recent years prompting greater preparedness efforts.
- FEMA's refresh of the National Incident Management System (NIMS), including the addition of a "Center Management System" that focuses on emergency operation centers (EOCs), is both an opportunity to ensure clear delineation of roles and responsibilities between incident command and EOC functions and a challenge, in that it will require some revamping of EOC operational elements and training around the region.
- Technology advances and use of social media continue to explode on the scene, changing the way emergency managers, Public Service Answering Points (e.g., Text-to-911) and first responders do business, coordinate, and relate to the public. The digital age is also increasing the need for more robust cyber-security systems.
- New federal legislation (e.g., 2013 Sandy Recovery Improvement Act) and FEMA's recovery planning framework are prompting more pre-disaster recovery planning around the country. For our region, we will lean heavily on the State of Oregon's Recovery Plan for guidance.
- A series of law suits against emergency management agencies in major cities (e.g., New York and Los Angeles) for inadequately addressing the needs of people with disabilities and others with access and functional needs (DAFN) has led to an increase in emergency management agencies assessing their own plans and programs and addressing DAFN gaps.
- The appointment of the Oregon Resilience Officer in 2016 bodes well for increased momentum in translating the Oregon Resilience Plan into legislation in the coming years.

Gaps and Maintenance Needs

- Local and FEMA Region X after action reports from the June 2016 Cascadia Rising Exercise identify major areas of improvement needed in response capabilities for catastrophic events, including planning, public information (e.g., need for more pre-scripted messages), operational coordination (e.g., Regional MACS), resource ordering and logistics, and communications.
- The RDPO has a range of existing response capabilities (e.g., plans, systems, tactical teams and equipment) that need maintenance/enhancement. A large portion of specialty equipment

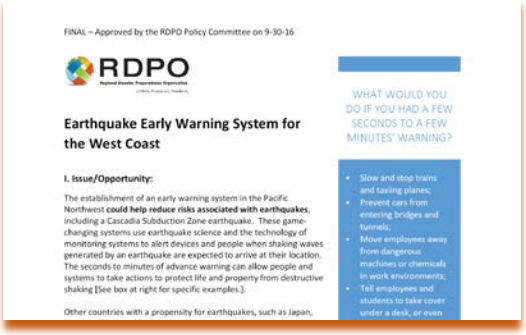
purchased under UASI years ago is at its end of service/life or new technologies have emerged; decisions will need to be made what should be replaced by the jurisdictional owners or the RDPO.

- There is a clear gap in planning for events with high/critical impacts (e.g., disruptions to energy/fuel, water and sanitation, communications systems, etc.; mass displacement).
- There is a need for greater engagement with the private sector in all areas of preparedness.

V. Priorities/Themes

As the RDPO enters its next phase of work, the following strategic priorities or themes have emerged:

Continue to cultivate the RDPO's voice on key issues that advance disaster preparedness and resilience efforts. In 2016, the RDPO's Policy Committee (PC) began to develop its first legislative agenda and began to take positions/advocate for a range of State of Oregon and Federal bills, as well as wrote letters in support of partners seeking state/federal funding for resilience projects. The PC approved the RDPO's position on the Earthquake Early Warning System for the West Coast, which advocates for fully funding the system (with federal, state and private funds) and commits RDPO partners to develop consistent pre- and post-disaster public messaging once the game-changing system becomes a reality.


FINAL – Approved by the RDPO Policy Committee on 9-30-16

RDPO

Earthquake Early Warning System for the West Coast

I. Issue/Opportunity:

The establishment of an early warning system in the Pacific Northwest could help reduce risks associated with earthquakes, including a Cascadia Subduction Zone earthquake. These game-changing systems use earthquake science and the technology of monitoring systems to alert devices and people when shaking waves generated by an earthquake are expected to arrive at their location. The seconds to minutes of advance warning can allow people and systems to take actions to protect life and property from destructive shaking [See box at right for specific examples.].

Other countries with a propensity for earthquakes, such as Japan,

WHAT WOULD YOU DO IF YOU HAD A FEW SECONDS TO A FEW MINUTES' WARNING?

- Slow and stop trains and taxiing planes;
- Prevent cars from entering bridges and tunnels;
- Move employees away from dangerous machines or chemicals in work environments;
- Tell employees and students to take cover under a desk, or even

To increase its competence and capacity to advocate, the RDPO has begun to develop key partnerships, including with the State (Oregon) Resilience Officer and the Oregon Seismic Safety Policy Advisory Commission (OSSPAC), Levee Ready Columbia, the Association of Counties (AOC), the League of Cities, et al.

Under the banner of "Infrastructure and Community Resilience and Disaster Preparedness (for earthquakes and other major events)," the Policy Committee will determine whether and how to be a voice on:

- **Fuel resilience** - encouraging/supporting legislation to address seismic vulnerabilities in the Central Energy Infrastructure Hub in Portland, as well as public-private-non-profit sector coordination;
- **Mass displacement preparedness** - encouraging/supporting legislation that advances greater coordinated state and regional planning for post-earthquake mass displacement response and recovery planning (e.g., mass sheltering; temporary housing);
- **Critical infrastructure resilience** - in addition to fuel infrastructure resilience, supporting greater coordination on critical transportation planning and prioritization of seismic retrofitting of roads and bridges; critical facilities seismic retrofitting, including updating building inventory, tracking retrofit projects, advocating for the Oregon Safety Assessment Program and more funding; all tied to state level; public-private-non-profit sector engagement;
- **Other regional hazard mitigation action planning/risk reduction** – e.g., mitigate flood risk in our region by supporting the efforts of the Levee Ready Columbia Project); and

- **Funding to sustain local and regional (i.e., RDPO) preparedness efforts** - e.g. Homeland Security Grant Program, including UASI, State Homeland Security Program; federal and state funding for natural hazard mitigation/pre-disaster recovery planning and community resilience programs; and RDPO contributing member contributions.

Keep strengthening response capabilities, including for incidents with high/critical impacts (e.g., disruptions to energy/fuel, water, sanitation, communication systems, etc.; mass displacement, mass casualty, and mass fatality, etc.). Before the RDPO, and since its formalization, the region has directed the lion's share of UASI grant resources into developing all-hazards response plans/planning frameworks and response systems/organizations (e.g., CAD-to-CAD Enterprise Service Bus, regional WebEOC boards, the Regional Multi-Agency Coordination System) and in training and equipping various first responders and tactical teams (e.g., SWAT, Metropolitan Aviation Support Team, marine and urban search and rescue teams, CBRNE/HazMat teams, the Regional Mass Fatality team, emergency water repair roads maintenance crews, etc.). Maintenance needs abound, including updating and exercising key plans (e.g., the Utility Coordination Plan), continuing to support Emergency Operations Center (EOC) readiness and coordination in the region, tackling resource ordering and logistics system challenges, and taking stock of/enhancing the tactical teams and equipment that the region will need to call upon in larger-scale events. The RDPO will also continue to support health care/hospital system partner, the NW Oregon Health Preparedness Organization (HPO), in the coming years as it develops Pediatric Surge Plans and tackles a long-standing need for Patient Tracking in mass casualty events.

During the next few years, the RDPO endeavors to begin addressing how the region will mount a coordinated response to mass displacement from a Cascadia Subduction Zone earthquake, including coordinating on mass care/sheltering and volunteer and donations management planning. Along similar lines of planning for disruptive/large impact events, the RDPO's Regional Disaster Preparedness Messaging Task Force will translate the technical guidance produced by the Disaster Sanitation Task Force in 2016 into pre- and post-disaster messaging that supports the public's understanding of the operational realities of service disruption post-earthquake and the steps they will need to take to maintain sanitation until services return.

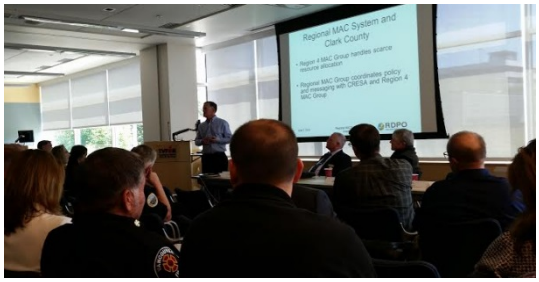
Expand mitigation mission area work: this area of the RDPO's work has traditionally centered on providing grants to support the enhancement of Citizen Corps and other community preparedness programs and teams around the region. The RDPO will continue to support these efforts, with a view to building consistency/interoperability across the programs where possible, and looks forward to seeing the results of innovative work to implement social resilience strategies (e.g., Map Your Neighborhood) and to engage people with access and functional needs and communities of color (e.g., LISTOS!).

During the next five years, the RDPO will expand its efforts to provide the region with more reliable data and information on the risks and potential impacts of earthquakes and other natural hazards and will explore taking a regional approach to mitigation action planning and prioritized project implementation. The RDPO will also continue to refine its THIRA for tactical and strategic planning application. Coordinated disaster preparedness/resilience public messaging also falls largely under this mission area; to boost these efforts will likely require the RDPO to hire a public information/communications officer.

Expand recovery mission work: more than a decade before the RDPO was stood up, the signature recovery mission area project in the region was disaster debris management planning. That effort saw a boost when Metro hired a disaster debris planner in 2015 and began to lead the regional effort. As this initiative moves forward to help regional partners complete important work in pre-siting of temporary debris storage sites, debris forecasting and pre-selection of contractors, the RDPO's five counties will expand the RDPO's recovery portfolio by commencing pre-disaster recovery planning (e.g., for economic, health system, housing and other key recovery elements) guided by the State of Oregon's Recovery Plan and FEMA's recovery planning framework. Along this road will come more partnerships, including within private sector.

Advance equity efforts in the region: The RDPO is committed to supporting the advancement of equity and inclusion efforts around the region, including assuring that the needs of people with disabilities and others with access and functional needs (DAFN) are met pre- and post-disaster. With funds from UASI and Metro, the RDPO recently completed a DAFN assessment of the emergency management programs and plans of Clackamas, Clark, Multnomah and Washington Counties and the City of Portland, including in the areas of alert and warning and public information, mass care and sheltering, and evacuation and transportation. The recommendations from that assessment, which will be available in a final report at the end of 2016, could form the basis of additional RDPO funding and organizational support.

Increase the RDPO's capacity to sustain regional coordination, collaboration, and governance. The RDPO continues to provide an important platform for regionally coordinated preparedness work. Entering a new phase of the RDPO ignites some organizational needs (e.g., for new task forces and professional staff, pending funding). These changes will ensure structural alignment and adequate capacity to execute the strategic and two-year plan (see Annex B). As the RDPO's governance structure and projects rely on member participation, RDPO partners are encouraged to align their own plans and staffing models with the RDPO's strategic and work plans, especially where value from regional engagement through the RDPO structure and RDPO project benefits can be derived.



To support organizational changes, the RDPO will work to improve communications and information-sharing, as well as horizontal and vertical interconnectivity, across the organization. The service level agreement between the RDPO and Portland Bureau of Emergency Management (PBEM), the RDPO's Lead Administrative Agency, will be developed during the next year. It will outline responsibilities,

obligations and mutual understandings between the two organizations. The standard operating procedure (SOP) for the UASI grant will also be updated, and a new SOP will be developed to guide local partner contributions under the RDPO.

VI. Strategic Goals and Objectives (2017 – 2021)

The following section contains the seven goals and 26 objectives that will guide the RDPO's work over the next five years. The first section focuses on Governance/Administration goals and objectives, while the other sections are organized along the five mission areas as follows: Prevention and Protection, Mitigation, and Response and Recovery.

1. Governance /Administration

Goal 1: Strengthen and sustain regional disaster preparedness coordination, collaboration, and governance.

Objective 1.1: Implement RDPO organizational changes/enhancements that ensure alignment with this strategic plan and maximize effective execution of the annual work plan.

Objective 1.2: Improve communication and decision-making between RDPO committees.

Objective 1.3: Identify, develop, and advocate for priority legislative and regulatory issues.

Objective 1.4: Maintain an effective and compliant grant program.

Objective 1.5: Seek, develop, and maintain strong connections to and coordination relationships with other regional organizations with a common mission or purpose (e.g., the NW Health Preparedness Organization, SW Washington Homeland Security Region IV, Regional Water Providers Consortium, Portland Dispatch Center Consortium, Area Maritime Security Committee, etc.)

II. Prevention and Protection Mission Areas

Goal 2: Enhance and maintain regional intelligence and information sharing, interdiction, disruption, and detection capabilities to help prevent and/or mitigate terrorism events, including cybersecurity, and other threats.

Objective 2.1: Strengthen the TITAN Fusion Center information-sharing network to enhance the Portland metropolitan region's understanding of terrorist and other threats and ability to prepare in a coordinated manner.

Objective 2.2: Enhance surveillance capabilities and improve analytics in the region.

Goal 3: Enhance the resilience of the region's critical infrastructure systems and facilities.

Objective 3.1: Promote improved joint planning for the maintenance and strengthening of regional critical infrastructure (CI) systems, including water, sewer, gas, fuel, telecommunications, electric, etc.

Objective 3.2: Support the development and maintenance of continuity of operations plans by the region's critical facility owners/operators.

III. Mitigation Mission Area

Goal 4: Enhance the region's ability to identify and understand local risks, educate and better prepare the public to manage those risks, and foster long-term community well-being.

Objective 4.1: Support community-centered resilience building efforts.

Objective 4.2 Lead or commission regional threat and hazard identification, vulnerability and risk assessments, and other research that supports efforts to mitigate risks and address planning and other preparedness gaps.

Objective 4.3 Develop and implement a prioritized regional natural hazard mitigation action plan (RMAP).

Objective 4.4: Develop and deliver coordinated public education campaigns on public safety, disaster preparedness, response, and recovery in multiple languages.

IV. Response and Recovery Mission Areas

Goal 5: Build and maintain regional response capabilities necessary to save lives, meet basic human needs, and protect property and the environment during an emergency or disaster.

Objective 5.1: Develop and maintain comprehensive regional and local emergency response plans inclusive of the whole community and addressing the needs of people with disabilities and others with access and functional needs.

Objective 5.2: Build-up and maintain regional tactical response and special or other teams' capabilities through equipment investments, training and exercises.

Objective 5.3: Enhance and maintain regional health system, public health, and behavioral health capabilities to effectively respond to mass casualty events or other health threats.

Objective 5.4: Increase regional epidemiological (Epi) response and medical counter measures (MCM) capabilities.

Objective 5.5: Enhance communications operability, interoperability, and redundancy in the region.

Objective 5.6: Enhance situational awareness and common operating picture capabilities in the Region.

Objective 5.7: Develop and sustain a Regional Multi-Agency Coordination System (RMACS) to provide effective regional coordination and resource allocation.

Objective 5.8: Support the enhancement of local Emergency Operations/ Coordination Center readiness across the region.

Goal 6: Build and maintain core capabilities necessary to assist affected communities, as well as the region as a whole, to recover effectively from major emergencies and disasters.

Objective 6.1 Conduct whole community pre-disaster recovery planning across the region, which defines post-disaster planning structures and successful recovery outcomes, critical timelines and priorities for key sectors.

Goal 7: Enhance and maintain regional capabilities to prepare and deliver coordinated, prompt, reliable and actionable information to the whole community before, during and after disasters.

Objective 7.1: Maintain the Regional Joint Information System and ensure that local information systems are prepared to feed into the regional system.

Objective 7.2: Enhance and maintain regional capacity to produce consistent preparedness and community resilience messaging (in coordination with state and federal agencies).

Objective 7.3: Produce regionally agreed upon (pre-scripted) response and recovery public messaging, ensuring inclusion of people with access and functional needs.

Objective 7.4: Strengthen the ability of local governments to deliver emergency messages to the public through systems such as Public Alerts, Wireless Emergency Alerts (WEA), Emergency Notification Systems (ENS), and the Emergency Alert System (EAS).

[Note: Annex A and Annex B are separate electronic documents and can be found here.]

RDPO
Regional Disaster Preparedness Organization
United. Prepared. Resilient.

What is Disaster Recovery?

A roadmap back to a strong community after a natural disaster

Disaster recovery is planning **before** a disaster, and planning and implementation **after** a disaster, to:

- Adequately shelter survivors, both in the interim and long-term.
- Restore health, social, and community services.
- Ensure infrastructure support for all community functions.
- Restore economic and community prosperity.

The Intention of Recovery

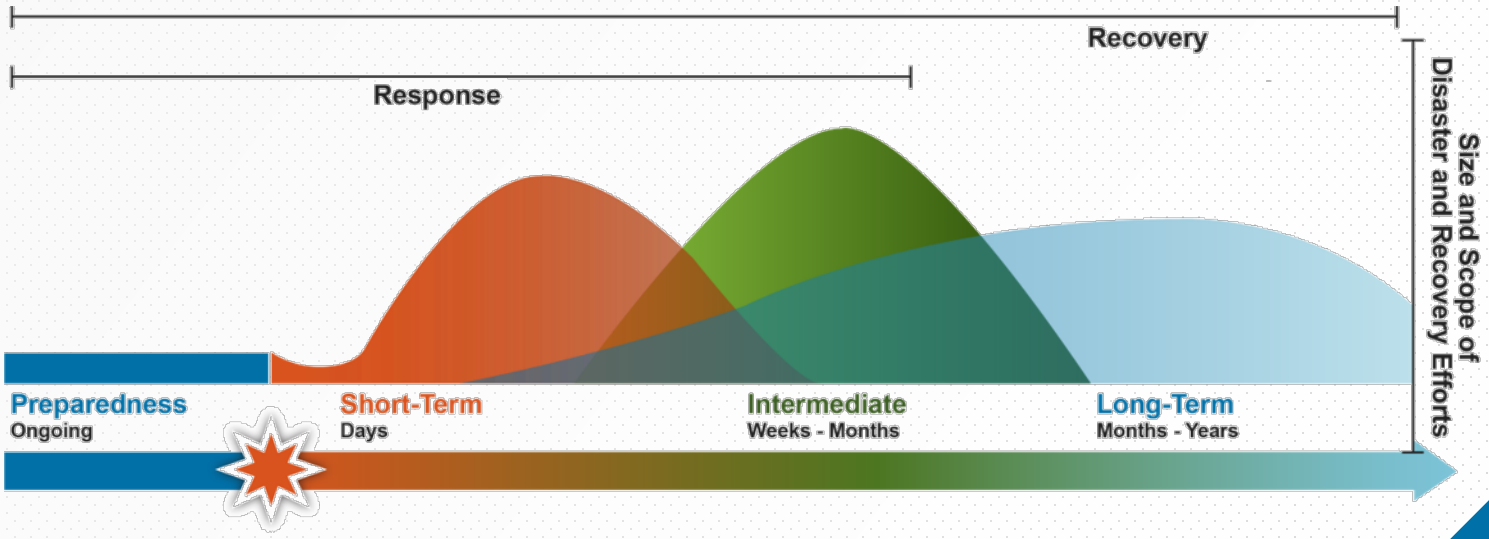
The aim of recovery is to restore the community to its previous state — or better.

- **Before** a disaster, communities can plan and implement projects to be more resilient.
- **After** a disaster, communities must plan and implement projects to restore services and community well-being.

Recovery succeeds if the *whole community* gets involved in planning, prioritizing, and implementing projects.

Recovery Timeline

The transition from response to recovery happens in waves depending on the complexity of issues inherent to any disaster. Recovery activities occur both before and while immediate emergency actions are ongoing; however, a an orchestrated recovery effort can only begin after the lasting impacts of an incident are known. Recovery has three timeframes—short-term, intermediate, and long-term — which include issues, decisions, and projects well beyond immediate needs such as rescue.



Above: Recovery Continuum from the National Disaster Recovery Framework

Recovery Planning and Recovery Framework: What's the difference?

Recovery *Planning* involves activities designed to improve a community's ability to manage recovery from a specific incident.

A Recovery *Framework* is broader, guiding both pre-disaster planning and post-disaster recovery for all incident-types by outlining governance structures and determining community priorities to use resources effectively, efficiently, and equitably.

Recovery Support Organization

Successful recovery from a disaster requires an organizational structure for coordination among stakeholders that facilitates problem solving, improves access to resources, and integrates principles of resilience, sustainability, and mitigation throughout all stages of recovery.

The Portland Metropolitan Region Recovery Framework Project is using seven Recovery Support Functions (RSFs) as components of this organizational structure within the five-county Portland Metropolitan Region. These will provide the structure to advance recovery planning and implement recovery activities after a disaster to best meet local and regional needs.

The Seven Recovery Support Functions	
Community Planning and Capacity Building	Unifies and coordinates expertise and assistance programs between both governmental as well as non-government partners to ensure engagement of the whole community in planning and managing recovery.
Land Use and Redevelopment Planning	Guides physical development following an incident to determine how and where to build, rebuild, vacate, and which areas to preserve.
Economic Recovery	Helps levels of government and the private sector sustain or rebuild businesses and employment.
Health and Social Services	Supports recovery in public health, health care facilities and coalitions, and essential social services.
Housing	Coordinates resources for adequate, affordable, equitable, and accessible housing to support the whole community.
Infrastructure Systems	Helps restore infrastructure systems and services, and improves resilience for future hazards.
Natural and Cultural Resources	Works to protect and restore natural and cultural resources and historic properties.

Want to Learn More About Recovery?

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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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SGA
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TREC
Transportation Insight for Vibrant Communities
at
Portland State
UNIVERSITY

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TABLE OF CONTENTS

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.

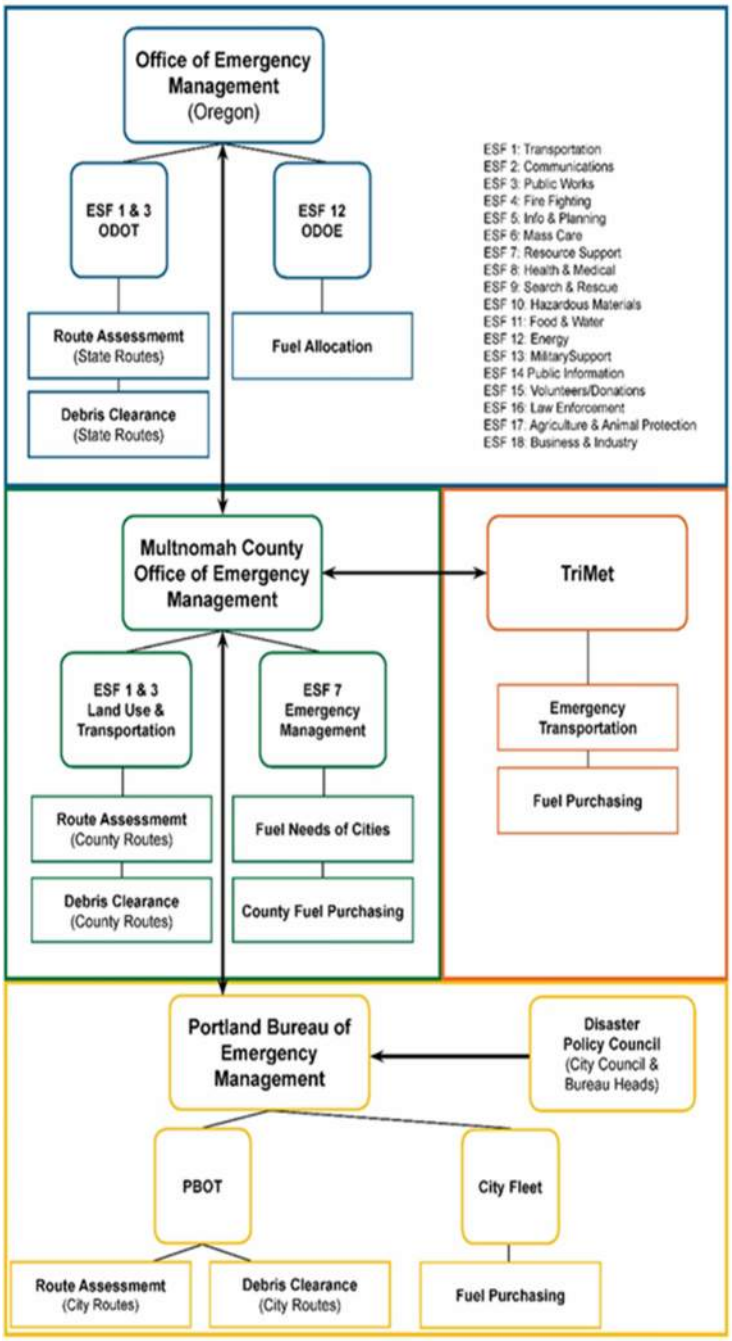

Figure 1.1 Emergency Management Structure – Transportation Full Activation

[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

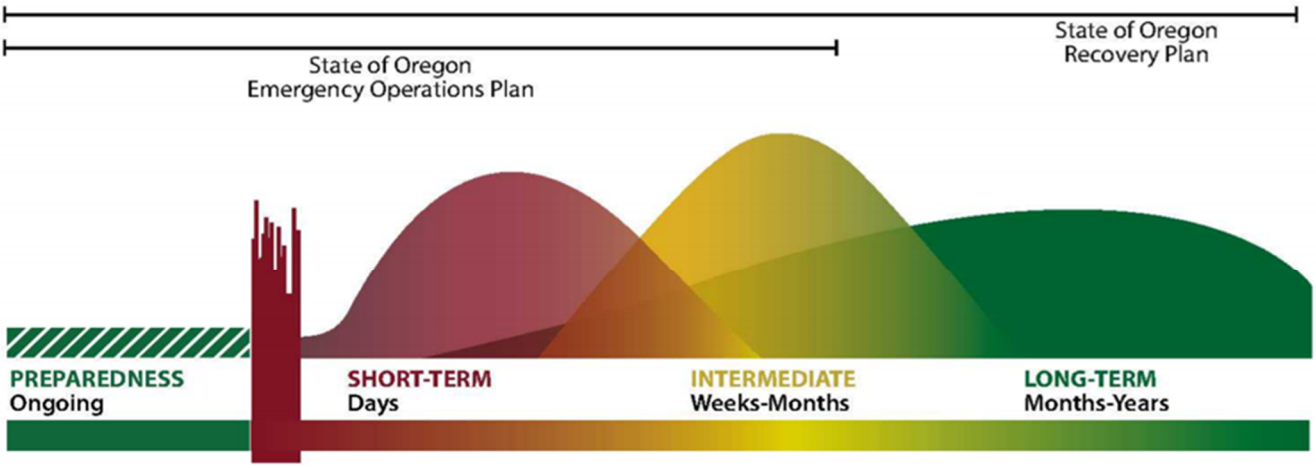

Figure 1.3 Recovery Continuum

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.

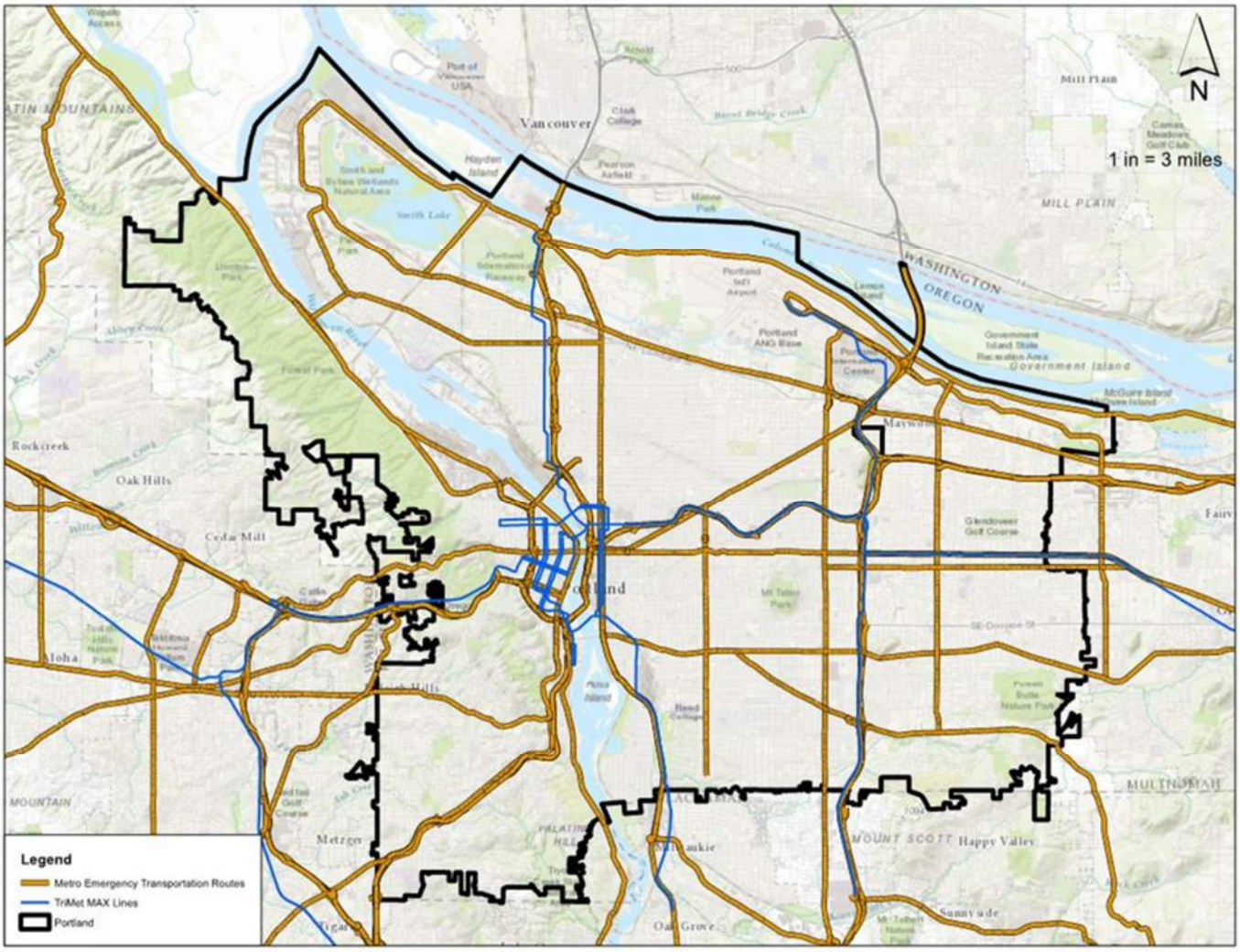

Figure 3.1 ETRs and TriMet MAX Lines

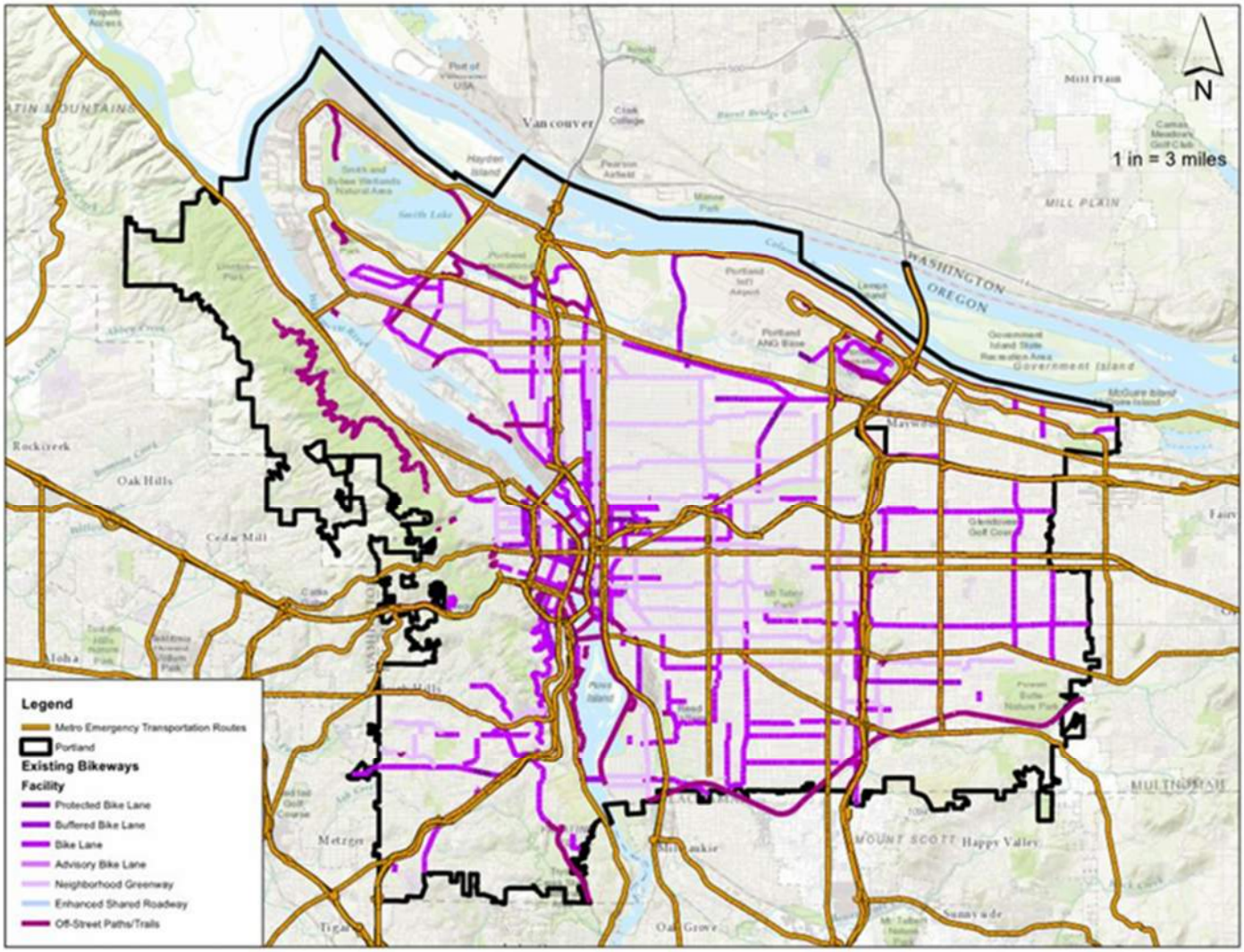

Figure 3.2 ETRs and City of Portland Priority Bicycle Network

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).

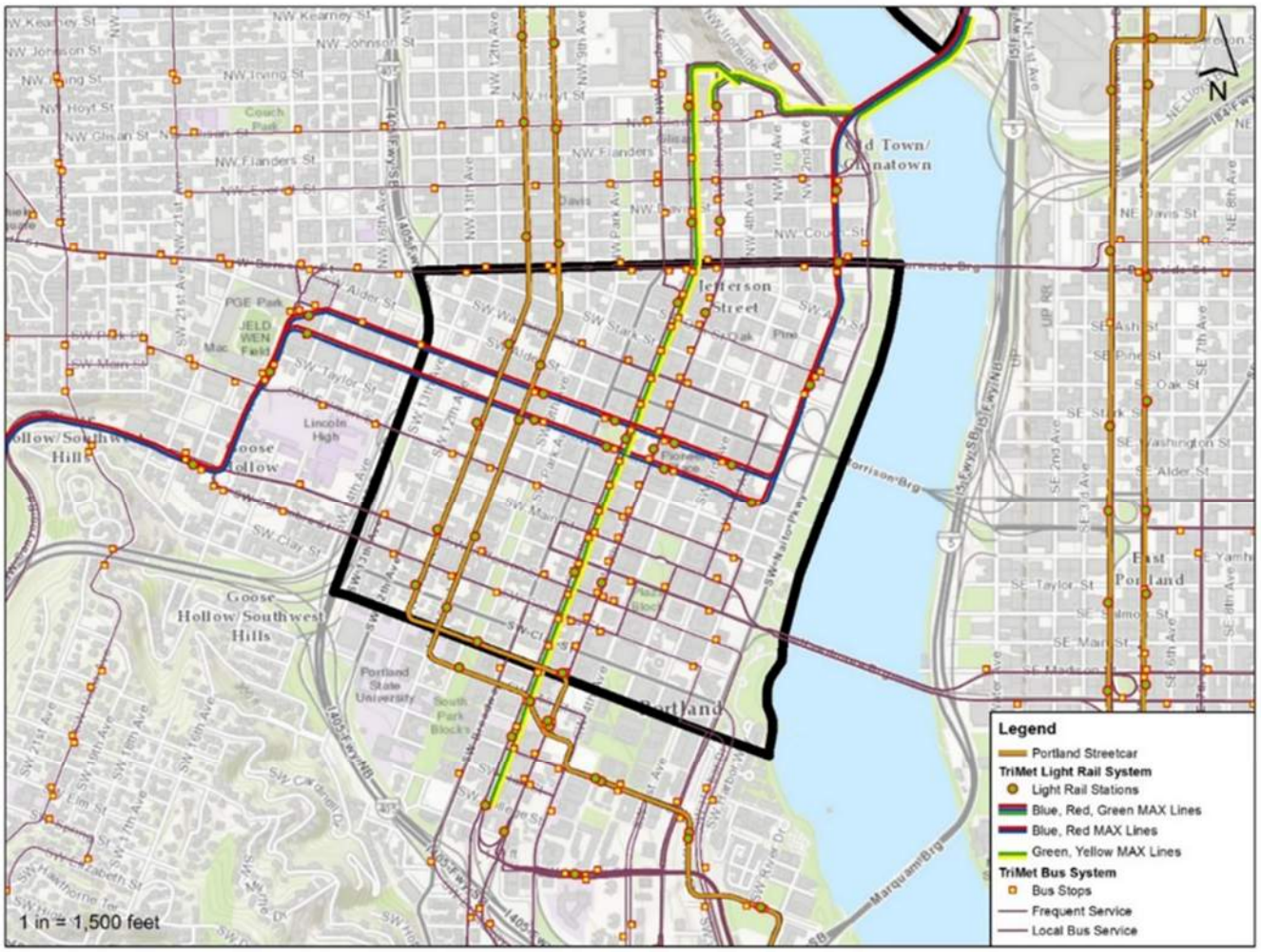

Figure 3.3 Downtown Portland

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.

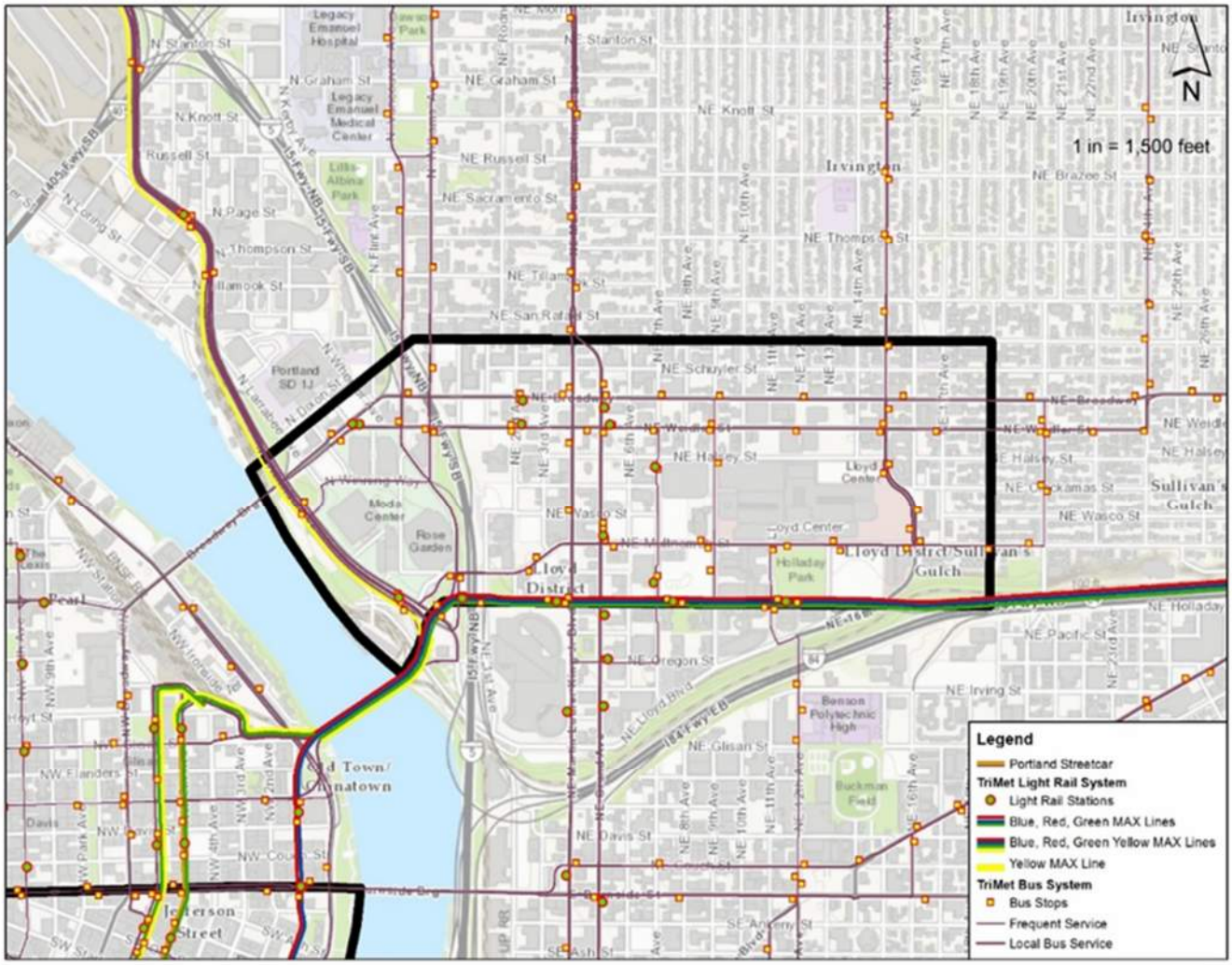

Figure 3.4 Lloyd District

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.

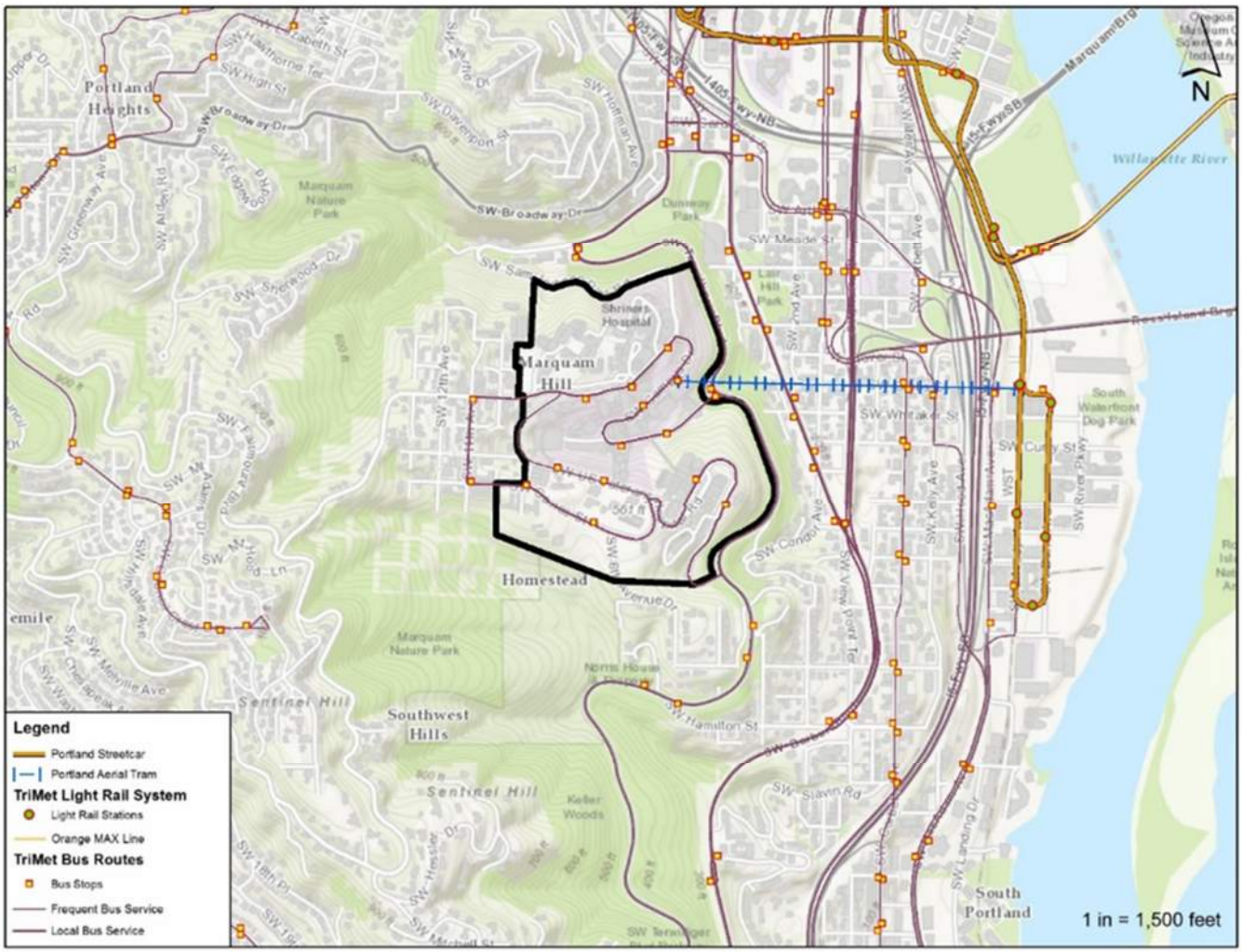

Figure 3.5. OHSU District

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.

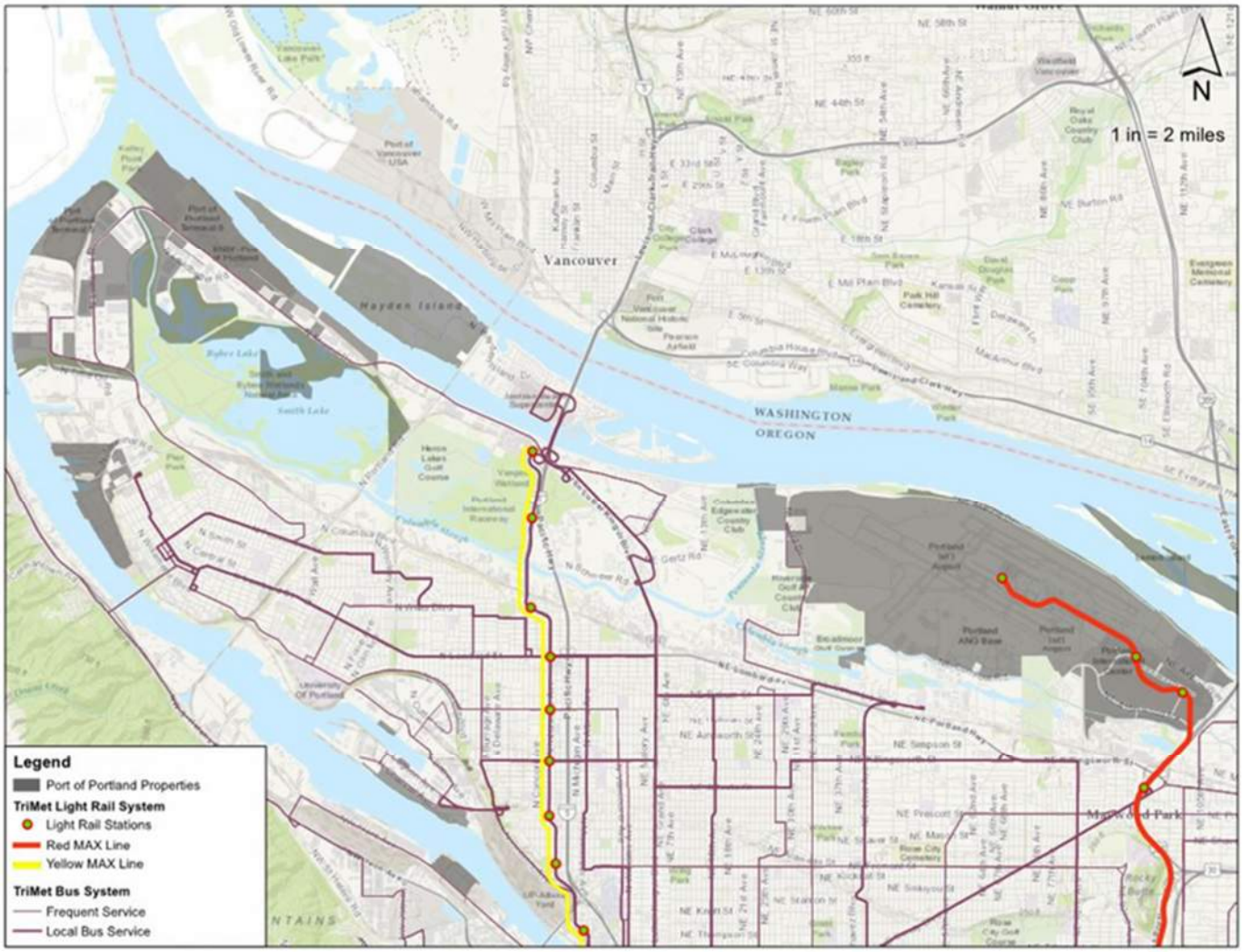

Figure 3.6 Port of Portland

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.

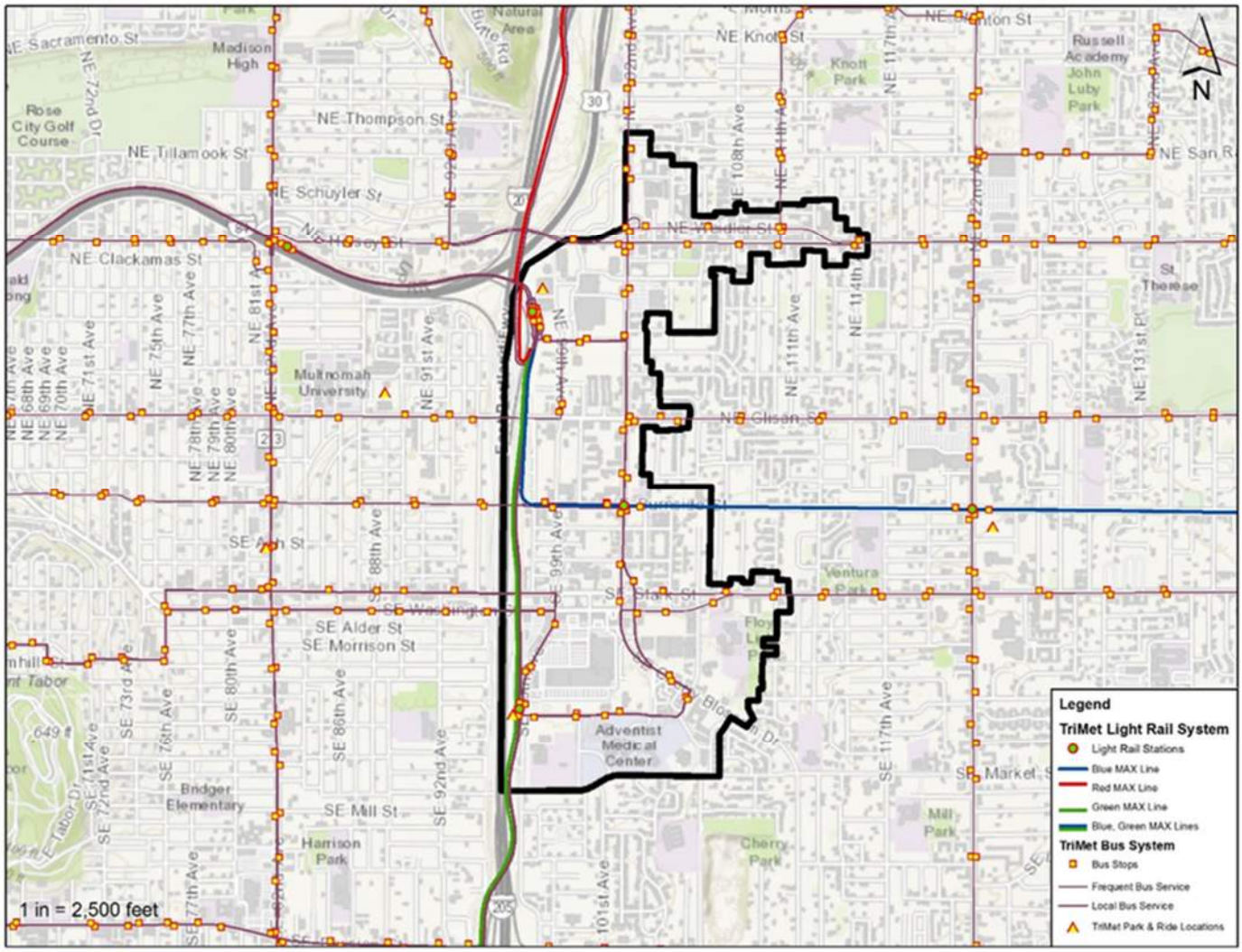

Figure 3.7 Gateway District

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.

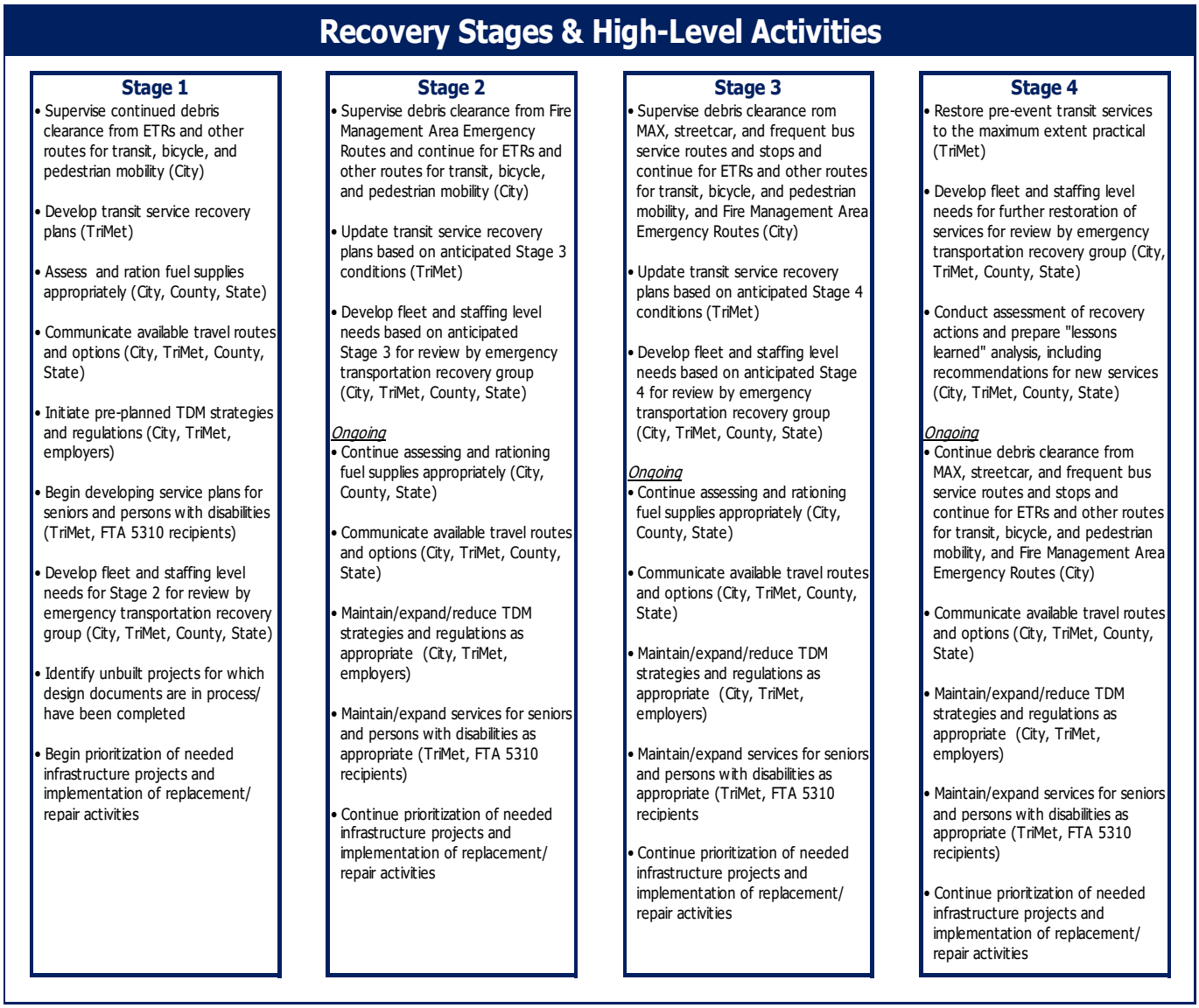

Figure 5.1 Recovery Stages & High-Level Activities

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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RIPE

Resilient Infrastructure Planning Exercise

Summary of Findings

Portland, Oregon

June 2018

Institute for Sustainable Solutions

PORTLAND STATE UNIVERSITY

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The quotes featured throughout this report were made by RIPE participants.

Introduction

According to NOAA (2018), the U.S. spent a record $306 billion on weather and climate disasters in 2017, up nearly $100 billion from the previous record in 2005 following Hurricane Katrina. From unprecedented rainfall and flooding from Hurricane Harvey in Houston, Texas, to ravaging wildfires and devastating mudslides near Santa Barbara, California, cities across the U.S. are grappling with how to better prepare for and recover from catastrophic natural disasters. These events bring into focus the need to prepare for similarly unprecedented events in Portland.

The Resilient Infrastructure Planning Exercise (RIPE) began in early 2017 as an effort to better understand the risks posed by major natural disasters to the City of Portland's (City) infrastructure, and to identify near- and long-term steps to build the resilience of those systems.

RIPE was specifically focused on the intermediate and long-term recovery phase of a disaster, rather than emergency response (see Figure 1). The Federal Emergency Management Agency (FEMA) describes the recovery process as a sequence of interdependent and often concurrent activities that progressively advance a community toward a successful recovery. Steps taken by Portland to build resilience (e.g., mitigation and preparation), and to have clearly established recovery priorities in place prior to a disaster, will have positive cascading effects resulting in a faster and more successful recovery.

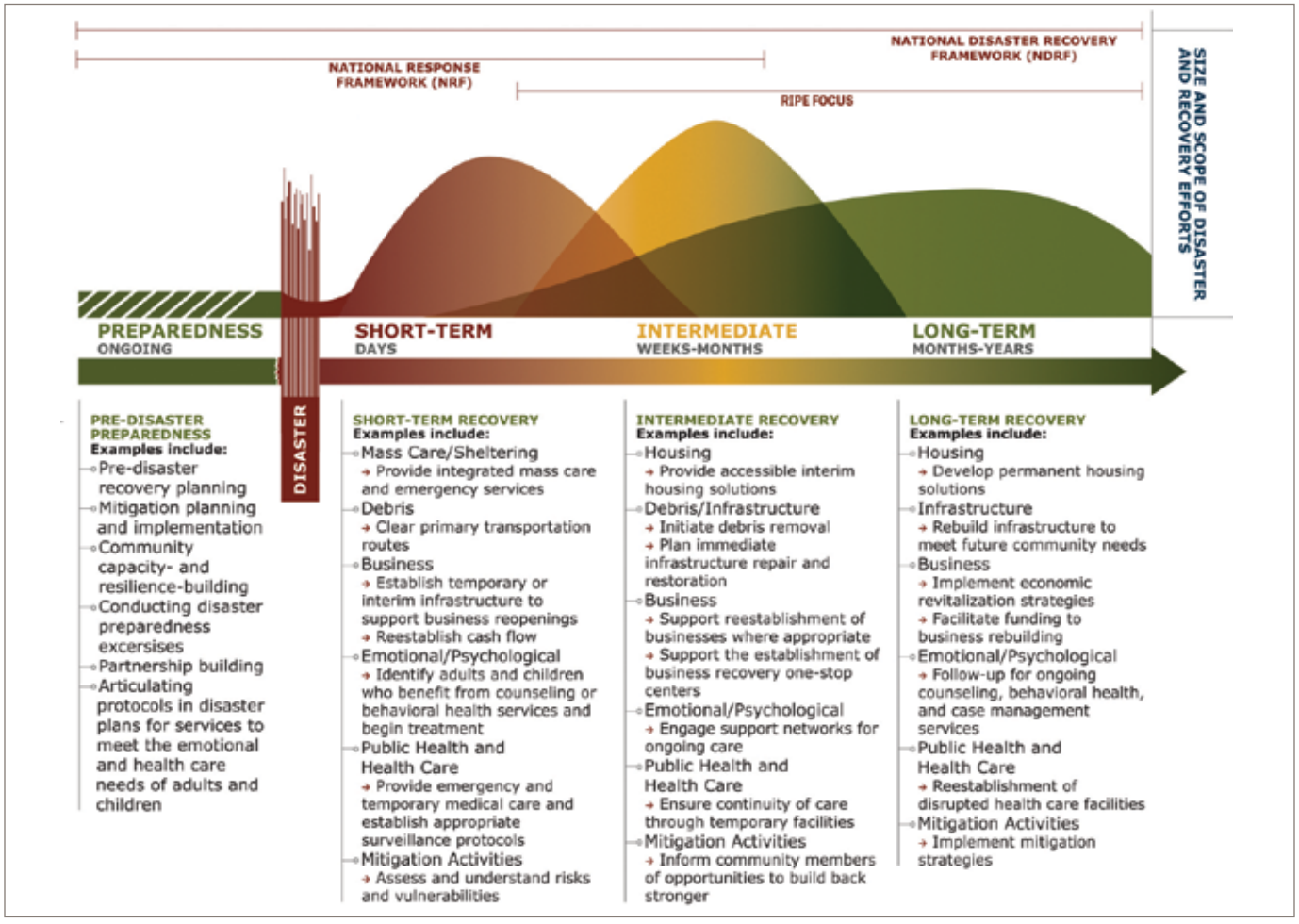

Figure 1. FEMA recovery continuum (FEMA 2011). RIPE focused on the intermediate and long-term phases of recovery

RIPE focused on two types of disasters that pose a very real threat to Portland including a Cascadia Subduction Zone earthquake, and major flooding and landslides precipitated by a historically unprecedented rain-on-snow event made more severe from climate change.

City staff from six bureaus, along with partners at Portland State University's Institute for Sustainable Solutions, used the disaster scenarios to help identify critical infrastructure, assess interdependencies, and estimate the expected time required to recover and/or rebuild those systems. The RIPE process confirmed, refined, and elevated the importance of resilience and recovery planning work in the City of Portland.

Each infrastructure bureau manages assets that can be impacted by failures of the systems managed by other infrastructure bureaus. For example, the Bureau of Environmental Services requires water from the Portland Water Bureau to flush their sewer and storm water systems to facilitate repairs. The Water Bureau is dependent on the Bureau of Transportation to access critical pump and pipe networks to make repairs. In turn, critical emergency routes and roads could be compromised by sinkholes created by broken water and sewer pipes. Portland Parks & Recreation has essential equipment that can be deployed to help all bureaus in the face of an emergency, however that equipment may be stranded due to roads damaged from floodwaters or liquefied soils following a major natural disaster.

If one bureau's assets fail, there could be cascading impacts for the other bureaus. Investing in resilience and recovery planning can prevent these cascading failures, protect critical infrastructure and the community, and help Portland rebuild efficiently and equitably after a disaster.

RIPE participants felt that citywide resilience and recovery planning would pay big dividends, not only following a disaster but more immediately by creating opportunities for more informed decision-making and for cross- bureau collaboration. Key takeaways from the RIPE workshops (discussed in greater detail in the Key Findings section of this report, page 8) included:

A. **Resilience and recovery planning is a smart investment,** but Parks and Transportation need additional resources and staff capacity, as well as direction from leadership, to be able to fully engage in this work.

B. **Success requires cross-bureau preparation,** as well as engagement of external partners, stakeholders, and the community.

C. **Bold leadership and a cross-bureau support structure to facilitate the work will help maintain the momentum engendered by the RIPE workshops.** Time is of the essence. Resilience and recovery planning and investments take time, and a coordinated approach needs to start now.

D. **Uncovering interdependencies will enable more effective and equitable recovery after a disaster,** and an integrated citywide recovery strategy will bring it all together. This will require governance in planning now, and for decision-making and direction during recovery.

E. **Rebuilding smarter and more equitably requires a shared community vision that should be shaped prior to a disaster.** The City also needs a process for making post-disaster recovery decisions that enables relatively streamlined decision-making, but with greater public transparency and engagement.

What follows is a report on the first year of efforts by a team of City staff and partners at Portland State University's Institution for Sustainable Solutions to identify opportunities to build Portland's disaster resilience and set the stage for quicker and more equitable recovery from a damaging event. The following sections provide background for this work, detail the RIPE process, present the key findings and outline next steps.

Background

Climate change is the greatest social and environmental challenge of the 21st century. It poses a serious threat not just to Oregon's natural treasures — forests, mountain snows and rivers — but also to our jobs and our health. Oregon is already starting to feel the consequences of this warming. Snowpack is declining, summer stream-flows are decreasing, wildfire activity is increasing, sea level is rising and coastal waters are acidifying from carbon pollution (Dalton, et al. 2017). In particular, a warmer atmosphere will increase the risk of large atmospheric river events and other storms that have historically caused rain-on-snow flooding and landslides in the Portland area, damaging infrastructure and putting communities at risk.

Also, in 2017, Portland witnessed firsthand the destruction of the Eagle Creek Fire. Fortunately, that fire remained in the Columbia River Gorge, but its proximity to Oregon's most populated urban area was a glimpse of how much damage could be done if such a fire were to ravage Forest Park. Floods and fires are increasingly likely risks in Portland's climate future.

Beyond climate and weather-related disasters, there is a 17 to 21 percent chance of a magnitude 8.5 or greater Cascadia Subduction Zone earthquake occurring in our region within the next 50 years (Goldfinger, personal communication, August 29, 2016). Modern Portland has never experienced the kind of destruction that an event of this magnitude will have on a major urban area, and because subduction earthquakes were not understood until recently, Portland's building codes have been largely inadequate. No one knows when the next subduction zone quake will occur, but all evidence points to the possibility that one will hit the region during our lifetimes (OSSPAC 2013).

These concerns have been the focus of recent efforts at the state, regional and local levels. The Oregon Resilience Plan was developed specifically to address the deficiencies in our state's infrastructure and systems in the event of a major earthquake (OSSPAC 2013). A regional recovery framework for the Portland metro region is currently under development through the Regional Disaster Preparedness Organization. The City recently adopted the Mitigation Action Plan (PBEM 2016), and City bureaus have developed continuity of operations (COOP) plans. The City has also worked with neighborhood associations to educate residents about how to survive a major disaster and assembled neighborhood emergency teams to manage response efforts in advance of official emergency assistance.

The Oregon Resilience Plan has identified time-to-recovery goals designed to improve the ability for continued prosperity and a stable economy in the weeks, months and years following a major a disaster. Portland residents' expectations about the City's current capacity to respond and recover are far from reality, however. For example, 83 percent of Portlanders expect local government to provide emergency aid within three days of a disaster, and 42 percent say they would leave Portland if electricity and water are not restored within two weeks (PBEM 2017).

As things stand now, Portland would be unable to recover in a timely manner without significant investments to enhance infrastructure resilience in the coming decades. While some bureaus are working to improve resilience, current City investments are not expected to result in infrastructure systems that can meet the State's goals within the 50-year timeframe.

RIPE Process

The focus of RIPE was to consider natural disaster resilience and recovery from a city-wide and cross-bureau approach. In 2015, the Portland City Council asked the Citywide Asset Managers Group (CAMG) how resilience fit in with their work to manage the repair, replacement and maintenance of the City's critical infrastructure. In exploring that question, the asset managers found it challenging to separately quantify the resilience measures and confirmed that successful resilience planning necessitated further coordination among bureaus and outside organizations.

The RIPE project team came together around an opportunity provided by the Global Consortium for Sustainable Outcomes (GCSO) CapaCities Project, an international program exploring the ability of city governments to increase capacity for sustainability planning through partnerships with local universities. It builds on an existing partnership between the City of Portland and Portland State University's Institute for Sustainable Solutions (ISS) which facilitated and project-managed the RIPE process.

RIPE Workshop Participating Bureaus and Departments

City of Portland

- Bureau of Development Services (BDS)
- Bureau of Environmental Services (BES)*
- Bureau of Internal Business Services (BIBS)
- Bureau of Planning and Sustainability (BPS)*
- Bureau of Revenue and Financial Services
- Bureau of Technology Services
- City Budget Office (CBO)
- Office of Management and Finance (OMF)
- Office of Mayor Ted Wheeler
- Portland Bureau of Emergency Management (PBEM)*
- Portland Bureau of Transportation (PBOT)
- Portland Fire & Rescue (PF&R)
- Portland Parks & Recreation (PP&R)
- Portland Water Bureau (PWB)

Multnomah County

- Multnomah County Bridges
- Multnomah County Emergency Management

* RIPE project team coordinating bureau

The RIPE project team established the following objectives for the project. In identifying these objectives, the group was informed by the Oregon Resilience Plan (OSSPAC 2013), Portland's Mitigation Action Plan (PBEM 2016), and similar resilience and recovery efforts in other communities — most notably Boulder, Colorado (BCC 2016a, 2016b, 2016c) following a cascading series of natural disasters involving fire, flooding, and landslides.

RIPE Objectives:

- Identify the City's critical or "backbone" infrastructure.
- Assess the City's ability to get critical infrastructure back online following a disaster, particularly for populations disproportionately impacted including communities of color and low-income populations.
- Better understand the interdependencies between different infrastructure systems.
- Develop citywide priorities to improve the City's overall resilience to extreme events.

Staff from across the City participated in a series of two day-long workshops (see Figures 2 and 3). Each workshop focused on disaster recovery (i.e., the months and years following a major natural disaster), as opposed to emergency response (i.e., the hours and days following). At the workshops, two scenarios were explored (see Appendix A for the scenario details):

- **Scenario one:** Historically unprecedented rain-on-snow event, made more severe by climate change, that causes flooding greater than a 500-year flooding event which could plausibly breach the levees, accompanied by landslides (see Figure 4).
- **Scenario two:** Magnitude 8.5 Cascadia Subduction Zone earthquake (see Figure 5).

Instead of aiming for a prescriptive outcome, the intent of the workshops was to begin cross-bureau discussions to identify vulnerabilities and interdependencies, and to lay the foundation for a multi-bureau disaster resilience and recovery framework.

Figure 2. Portland Bureau of Transportation staff share information with workshop participants on their core services and critical infrastructure such as emergency transportation routes..

Figure 3. Workshop participants use interactive maps to explore vulnerabilities and interdependencies.

Each scenario offered bureaus the opportunity to assess the impacts of the extreme event on their infrastructure, as well as the critical assets of the other infrastructure bureaus. Each bureau considered the following questions:

1. What critical infrastructure assets would be damaged?
2. Where would bureaus prioritize repairs?
3. How would considering the disproportionate impacts on communities of color and low-income populations shift repair priorities?
4. What are the interdependencies between the different bureaus' assets?
5. How can bureaus help each other?
6. How might bureaus hinder each other?
7. How could bureaus rebuild their systems better, smarter or more equitably?
8. What are the next steps for the City to plan for the effective and efficient recovery following a major natural disaster?
9. What can we do now, and what should we do in the coming years?

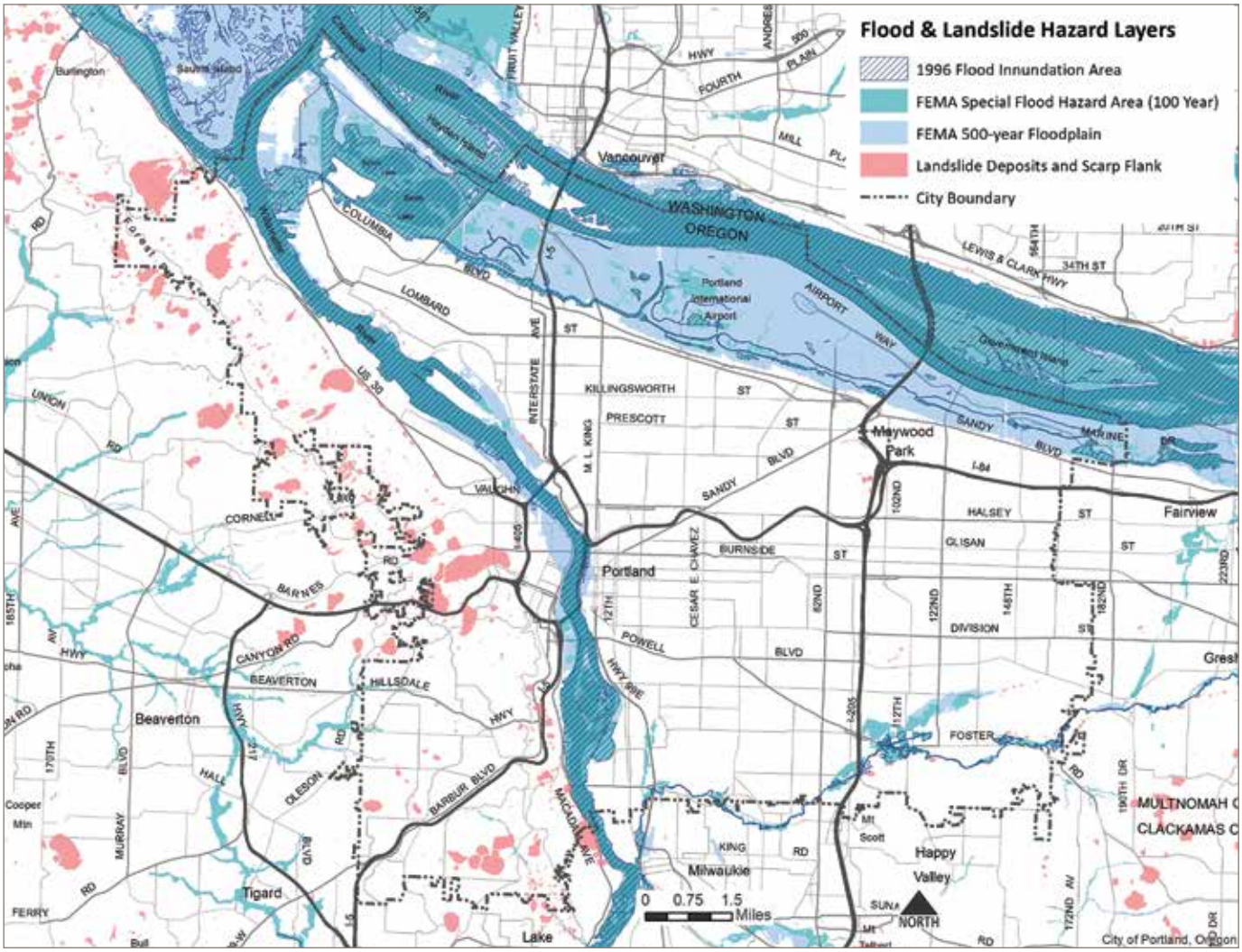

Figure 4. 500-year flood scenario showing extreme flooding along the Columbia and Willamette Rivers, and Johnson Creek.

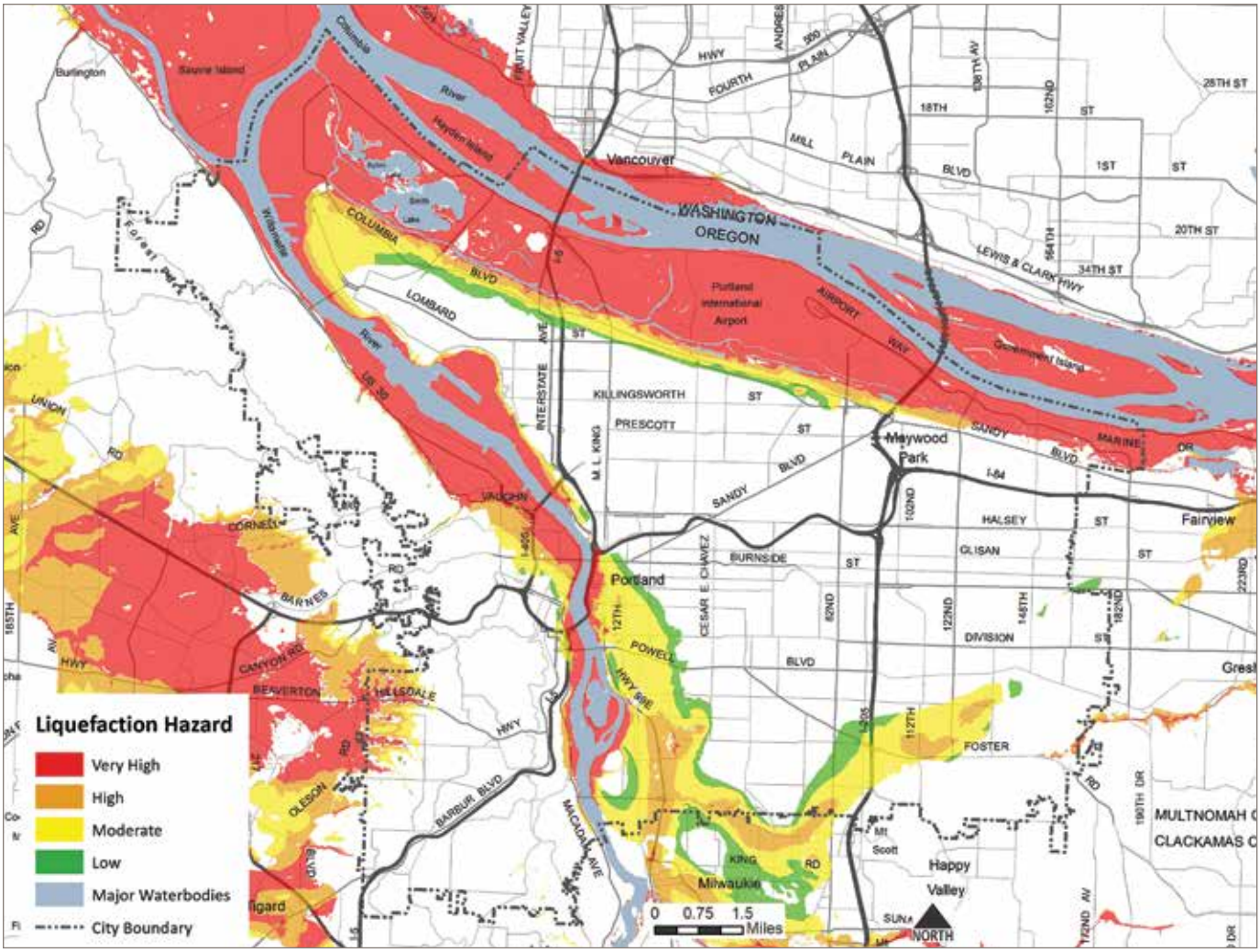

Figure 5. Areas of liquefaction ranging from low (green) to very high (red), likely to be activated in a Cascadia Subduction Zone earthquake.

Opening and closing surveys were distributed to RIPE workshop participants to understand the key findings and impacts (see Appendices B and C for more details). Participant surveys revealed overall enthusiasm for the RIPE effort, 100 percent of respondents ranked the workshops as an important use of their time, and cross-bureau collaboration ranked as one of the greatest impacts.

The workshops provided an opportunity for bureaus to learn about and discuss critical interdependencies that would have otherwise remained unconsidered and unaddressed. Staff also articulated that making this work a priority for the City would require: 1) leadership at all levels of the organization, including City Council and bureau directors, 2) clear expectations of staff to advance and integrate resilience and recovery planning into their everyday work, and 3) the resources needed to develop robust bureau-specific plans (especially for Parks and Transportation), as well as an integrated citywide resilience and recovery framework.

Key Findings

A. Resilience and recovery planning is a smart investment

> ***"Planning is money well spent, and investment in mitigation is more cost-effective than 'repair and replace' after a disaster."***

From New York to Boulder, San Francisco to Seattle, Atlanta to Boston, and Chicago to Dallas, U.S. cities are actively strengthening their ability to better manage ongoing stresses and prepare for, withstand and recover from major natural disasters. Portland should join these world-class cities by building on the solid foundation of existing efforts and facilitating a robust citywide recovery and resilience planning initiative.

Resilience and recovery planning requires cross-departmental work and creates the opportunity to come up with solutions that might not otherwise be identified. Such planning efforts will help City bureaus develop the tools and knowledge needed to reform policies, and identify where and how to invest to increase Portland's resilience in the face of extreme events. RIPE participants felt that focusing on such efforts in the near-term would pay big dividends, not only following a major natural disaster, but by minimizing the impacts of more common, less-disruptive natural hazard events.

In addition, resilience and recovery planning and investments can significantly reduce disaster-related costs. A recent study funded by FEMA found that building resilience to flooding, wind, earthquakes and fire can save $6.00 in future disaster recovery costs for every $1.00 spent on hazard mitigation; this is in addition to avoided deaths, injuries and post-traumatic stress disorder cases (MMC 2017).

Parks and Transportation bureaus need planning resources

> ***"Political will and ongoing financial resources are imperative, but both are tenuous."***

Individual asset-owning bureaus need resources to participate in this work. Parks and Transportation are at a different place compared to Water and Environmental Services in terms of available resources. Even though both are essential service providers critical to recovery, Parks and Transportation do not currently have the resources or staff capacity to fully engage in resilience and recovery planning, much less implementation.

For example, Parks' critical facilities need to be identified, assessed and prioritized, and money needs to be allocated for upgrades. Transportation funding is limited and often has spending restrictions which present challenges for coordination and collaboration with other bureaus. Environmental Services and Water have done robust work in this arena and are positioned to assist the other bureaus in accelerating their work. At the same time, they still have work to do to fully integrate resilience and recovery considerations into their investment decisions (e.g., capital improvement program project selection and budgets).

Addressing the resource gap for Parks and Transportation was one of the top priorities identified by all of the bureaus that participated in the RIPE workshops. Other priorities included: leveraging existing funding and projects to build resilience, advocating for funding for needed planning and staffing efforts, and securing new and ongoing resources to make needed resilience investments.

> ***"If we identify key projects as a group we are more likely to get funding. Decision-makers are waiting for someone to advocate for these improvements."***

B. Success requires cross-bureau preparation

> *"We have a bureau-centric approach to resiliency, but bureaus need each other to recover. The City needs bureaus to work together to recover post disaster, but our critical assets aren't well aligned."*

There are significant opportunities to improve the likelihood of Portland's successful recovery following a major natural disaster. All bureaus — including Water and Environmental Services, who already have robust resiliency planning efforts underway — will benefit from enhanced efforts to identify all the City's critical assets and understand their interdependencies.

Uncovering interdependencies enables effective recovery

The City's infrastructure systems can interact in ways that could amplify damage and create unexpected vulnerabilities and cascading failures (e.g., broken pipes washing out roads). There are also opportunities to leverage investments in some assets to enhance the resilience of other infrastructure systems (e.g., hardening Parks' irrigation wells so they can provide non-potable water sources during recovery).

To understand interdependencies, bureaus must first identify their own critical assets and evaluate their condition and performance. This evaluation should build on existing asset inventories and conditions assessments developed by bureau asset managers. However, bureaus are at different stages in this process. Parks, for instance, learned during the flooding scenario that critical maintenance and equipment storage facilities are likely to be stranded and inaccessible in a major flood event.

Similarly, Transportation has yet to determine the risks of a 500-year flood and major landslides to City-owned bridges. For Environmental Services and Water, the bureaus with the greatest capacity and experience with resilience planning and investment, concerns arose regarding unexpected interdependencies and vulnerabilities. In a seismic scenario, for instance, bureaus identified the potential for Environmental Service's pump stations to overflow sewage into the groundwater protection area of the Columbia South Shore Well Field, meriting further assessment.

> *"There will be widespread water quality issues across the city and a shortage of drinking water in both scenarios."*

> *"The first roads Transportation would clear after a disaster aren't necessarily the same roads Water or Parks would need cleared. This is something we can begin to think through now."*

The transportation network is critical for recovery, both because other agencies depend on the transportation network, and because the failure of other bureaus' assets can compromise important roads and bridges. In both the flooding and seismic scenarios, many assets identified as critical by Environmental Services, Parks and Water are likely to be inaccessible. Transportation's top priority would be clearing and repairing emergency transportation routes to meet the transportation needs of emergency responders and hospitals. However, many of those emergency routes are not near the critical assets that the other infrastructure bureaus will need immediate access to for repairing and restoring critical services like drinking water and sewage treatment.

In addition, many of the emergency routes also intersect with important water, sewer and storm-water pipes. In a major seismic event, these water pipes may break, resulting in washed out emergency routes and sinkholes.



City bureaus can't do it alone

The RIPE workshops intentionally focused exclusively on City-owned and managed infrastructure as a starting point for the discussion. However, identifying the interdependencies and potential cascading failures with infrastructure systems managed by other entities and agencies is also critical to the City's resilience and recovery planning.

In particular, many of the City's infrastructure systems are reliant on services provided by the utility companies. Power outages are to be expected and some estimate that it could take two to six months to recover electricity following a major earthquake. Without power, Environmental Services and Water will be unable to test and repair critical water and wastewater pump stations, which will delay their own recovery efforts. Similarly, important recovery services such as medical facilities and schools are dependent on the water, sewer and transportation services provided by the City.

Several entities such as Multnomah County, the Port of Portland, and utility companies have expressed interest in the RIPE effort. They, along with other City bureaus and key stakeholders, will add value to the work as it continues and expands.

C. Bold leadership and a support structure will maintain momentum

Successful cross-bureau collaboration, effective investments in resilience and timely recovery after a disaster will require significant levels of coordination across all the City's infrastructure bureaus. While opportunities for immediate, low-cost collaborative projects exist, citywide resilience cannot continue to be approached by only a few bureaus and in a piecemeal fashion.

Champions at both the bureau director and City Council levels are needed to prioritize this work, facilitate sustained progress and ensure investments that both enhance the City's resilience and enable future recovery in a timely fashion. Such leadership will prioritize integrated citywide resilience and recovery planning efforts that help improve livability by addressing today's community priorities, while also ensuring a smarter, more efficient and more equitable city tomorrow — with or without a disaster.

Time is of the essence

> ***"Someone needs to 'own' recovery."***

Recovery planning takes time. Investing in building the resilience of infrastructure systems takes even longer. The Oregon Resilience Plan, for example, sets a 50-year horizon to implement various policy and investment priorities. No one can predict if the Cascadia fault will rupture today or fifty years from now, and climate change is only increasing the likelihood of damaging precipitation events in the future. There is no time to lose.

Each year the City invests about half-a-billion dollars (City of Portland 2017) to maintain, repair, replace, and rehabilitate existing infrastructure or build new infrastructure assets that will be in place for generations. This means that bureaus are often missing opportunities to build greater resilience into existing projects, thereby locking in infrastructure that may be maladapted for extreme events for the foreseeable future. City leaders must begin prioritizing citywide resilience and recovery planning and investments now, to prevent a major natural disaster from being catastrophic for Portland in the future.

Citywide preparation needs a support structure

Portland's infrastructure bureaus have existing asset management programs and functions that enable informed decision-making. For example, the cross-bureau Citywide Asset Managers Group (CAMG) works to enhance coordination and dissemination of best practices. Future resilience and recovery planning efforts should leverage those existing efforts, while addressing challenges related to political will and funding needs to support robust resilience recovery planning.

Perhaps the greatest concern voiced by RIPE participants was that, without an organizing or supporting structure to foster collaboration, champion efforts and seek additional resources, the conversations that began in the workshops would lose momentum as participants returned to their day-to-day responsibilities.

Ideas for creating such a support structure included 1) identifying lead staff in each infrastructure bureau to drive bureau-specific resilience progress and enhance citywide collaboration, 2) create a cross-bureau resilience and recovery team, building on the Citywide Asset Mangers Group model, for sharing best practices, standardizing methodologies and enabling bureau-to-bureau mentorship, and/or 3) creating a resilience coordinator position to convene staff, facilitate the work at a citywide scale and further the detailed work, tasks and opportunities identified through the RIPE workshops.

D. An integrated citywide recovery strategy will bring it together

Citywide resilience and recovery planning would allow Portland's infrastructure bureaus — along with key partners, stakeholders and the community — to identify the obstacles that will be encountered during recovery when there will be great pressure to act quickly. Such an effort would also help to identify near-term, as well as post-disaster opportunities to approach rebuilding in ways that enhance equity, health, prosperity and natural resources.

Establishing strategic recovery priorities, prior to a disaster, will not only enable infrastructure bureaus to more effectively deploy limited resources and equipment, but will also help ensure that communities most vulnerable to the impacts of a disaster are not left behind in the recovery efforts. For example, East Portland is home to many communities of color and low-income populations. These communities are often hit hardest by a disaster because of underlying socio-economic disparities; in other words, they have access to fewer resources to respond to and recover from a disaster.

Although much of East Portland would likely fair better than other parts of the city during a major flood, landslide or earthquake event, key employment areas for people living in East Portland would be significantly impacted (see Figure 6). This means that while the homes of people living in East Portland might survive, many marginalized community members would not be able to return to work for prolonged periods of time. The disproportionate direct and indirect impacts of a disaster, as well as from any delays in recovery efforts needed in vulnerable communities, must be accounted for in establishing the City's recovery priorities.

Ideally, bureau-specific resilience and recovery plans would be integrated into a citywide recovery strategy that: defines how bureaus measure resilience (e.g., critical asset condition and performance), establishes recovery guiding principles and priorities, tracks status toward achieving Oregon's time-to-recovery goals, and outlines actions and investments to close the gap.

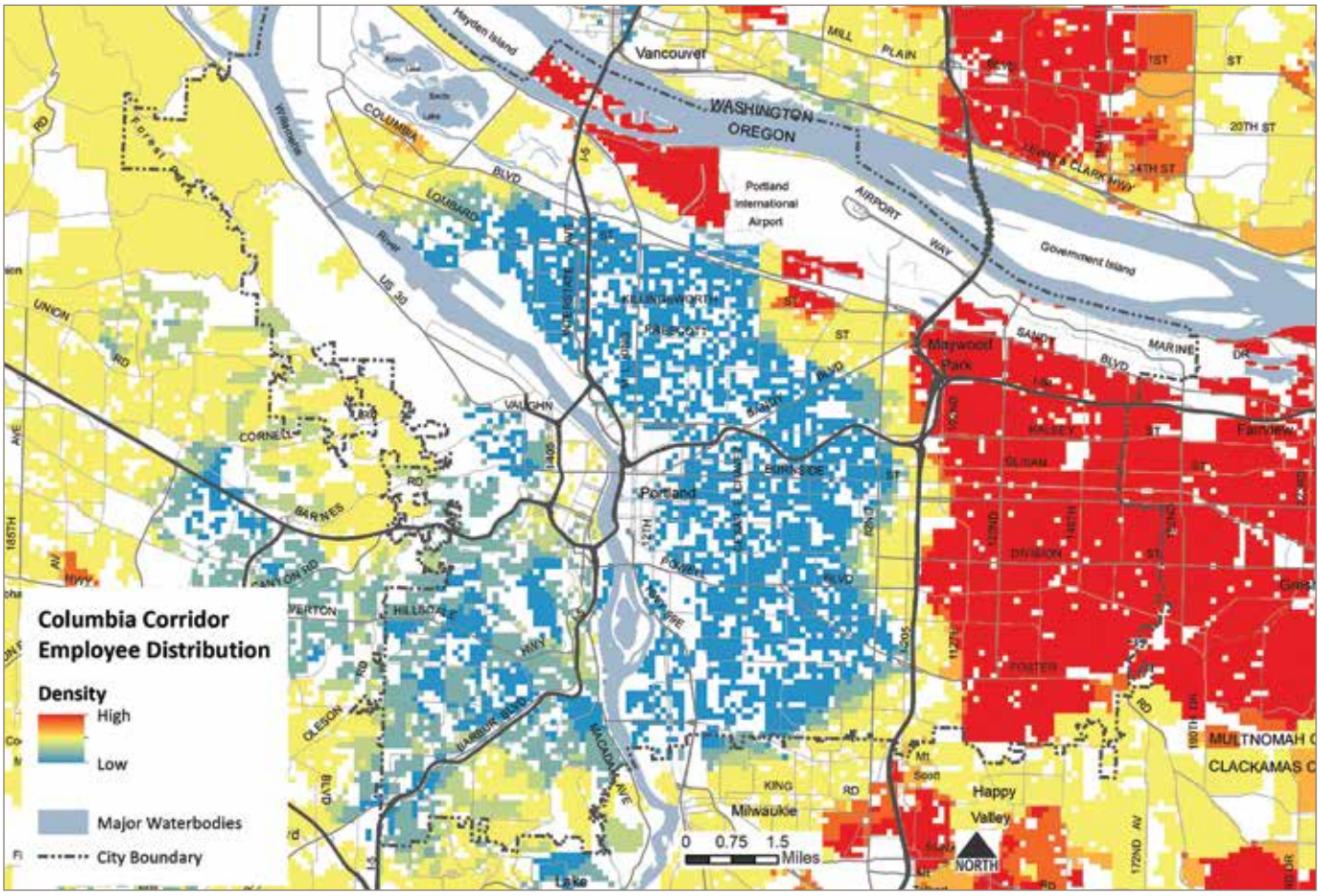

Figure 6. The Columbia Corridor is a key employment area along the Columbia River that would be significantly impacted in either of the scenarios explored in the RIPE workshops. High numbers of people living in East Portland (where many communities of color and low-income populations reside) work in the Columbia Corridor.

E. Rebuilding smarter and more equitably requires vision

A major earthquake or flood would mean redeveloping whole neighborhoods, or the whole city. Although devastating, with thoughtful pre-disaster planning there is an opportunity to build back a smarter, more efficient and more equitable city. An integrated citywide plan to increase resilience and to recover in the weeks, months and years following a major natural disaster would enable the City to set expectations around redevelopment goals and processes, and make investments now that set Portland on a path to rebuild smarter.

> ***"Improvements should not be constrained by historical codes and policies. We should try to think about long-term sustainability and build better and smarter now … a recovery plan has value and benefits even in the absence of disaster."***

Land use and infrastructure planners, together with the community, could envision today what rebuilding Portland could be like in the future. What new plans and zoning codes might make sense? Where would development in the future be prohibited? What areas could be repurposed as parks or natural areas? Could the transportation system be rebuilt to radically shift transportation modes toward transit, biking and walking? Could disaster contingencies be built into long-term infrastructure and land use plans by including provisions to automatically suspend, withdraw or amend rules that impede recovery?

The process of envisioning a rebuilt, more sustainable and equitable Portland would be a useful investment of time and resources, even in the absence of a disaster, because it can provide a reference for a future Portland that could be achieved through policies, plans and investments already under way.

We need a process for making post-disaster recovery decisions

There is currently no structure for effective and efficient decision-making for the time between emergency response (i.e., hours to days) and normal operations following a major natural disaster (i.e., months to years).

The City's Disaster Policy Council will fill this function during emergency response, and the City Council will resume such responsibilities once the City is largely recovered. There is a need to fill the gap between these two governance structures that would enable relatively streamlined decision-making, but with greater public transparency and engagement.

For example, the government in Christchurch, New Zealand, had to create a recovery agency and build its governance arrangements from scratch following the 2010/2011 Canterbury earthquakes because no agreed upon 'off-the-shelf' solution existed. These delays significantly hampered the community's ability to recovery, the impacts of which are still being felt today. A Portland recovery governance council, guided by an adopted citywide resilience and recovery strategy (as outlined earlier in this section), would enable more deliberate decisions and would likely be the determining factor in whether Portland has a successful and timely recovery.

Next Steps

Following the workshops, the RIPE project team worked with participants to review, synthesize and prioritize the findings outlined in this report. A handful of concrete next steps emerged, along with a list of potential priority actions that warranted further consideration.

Potential near-term resilience and recovery actions

RIPE participants identified several potential near- and mid-term actions to move the City's resilience and recovery work forward. The following list outlines several of the action ideas that warranted additional consideration and prioritization (this list does not, however, constitute commitments made by City bureaus for implementation).

1. Strategizing and leveraging the support of other bureaus to secure additional resources for Parks and Transportation to engage in resilience and recovery planning; this includes identifying mutually beneficial investments across bureaus, prioritizing resilience and recovery in the allocation of general fund resources, support in the development of resilience and recovery plans, and identifying other opportunities to address gaps in under-resourced bureaus.
2. Identifying opportunities for collaboration across bureaus, including "last mile" connections for critical transportation routes. For example, bureaus should align their capital replacement programs to improve efficiency, reduce overall cost, and ensure access to critical assets. Similarly, City bureaus should agree on a process to prioritize service recovery for critical facilities.
3. Focusing multi-bureau investments to build up the resilience of key locations and corridors in the city (rather than spreading those investments out in a scattered approach). Creating "resilient islands" around hospitals, schools, community centers and other important community recovery areas, and "resilient corridors" to more quickly restore North-South and East-West (including over the river) transportation connections.
4. Establishing various coordination and collaboration structures to support bureau-specific and citywide resilience and recovery planning and investments, potentially including:
   - A cross-bureau citywide resilience team.
   - A resilience leadership council (e.g., bureau directors).
   - A citywide resilience coordinator position.
   - Formal mentoring relationships to leverage existing expertise in Water and Environmental Services to bolster the efforts of Parks, Transportation, and Facilities.
   - Integrating resilience planning and investments into decision-making structures (e.g., capital improvement program project lists and budgets).
   - Opportunistically incorporating resilience into existing projects already being planned and constructed.
   - Cultivating leadership and champions that prioritize this work at all levels of the organization (e.g., staff, directors, City Council, external partners).
5. Exploring many of the interdependencies and potential cascading failures identified during the workshops (e.g., pipe breaks causing failures of emergency transportation routes, potential contamination of the wellfield protection area from damaged sewer pipes and pumps, utilizing Parks' expertise related to volunteer training and deployment, etc.).
6. Leveraging the City's partnership with Portland State University, and other academic institutions, to accelerate, facilitate and augment the City's efforts and assist with engaging additional stakeholders.

7. Evaluating the various options and best practices for facilitating cross-bureau collaboration and developing a citywide resilience and recovery strategy, including internal organizing structures and/or the creation of a citywide resilience coordinator position.

8. Developing an integrated resilience and recovery strategy that articulates recovery guiding principles, establishes recovery priorities and guides strategic investments. Such a strategy would consider and address disproportionate impacts of a disaster, and the associated recovery, on communities of color and low-income populations. The strategy should also address key recovery coordination issues such as: debris removal and storage, managing human waste, mitigating business and economic losses, and establishing key contractual relationships pre-disaster (e.g. construction contractors, sampling laboratories).

9. Establishing effective structures to store and share relevant resilience and recovery planning information across bureaus (e.g., information and maps of the City's critical assets, risks and vulnerabilities assessments, planning documents, lists of bureau experts and their credentials/certifications).

10. Identifying resilient and strategic post-disaster locations where multiple bureaus (and other key agencies) could co-locate recovery functions and equipment to optimize coordination and collaboration.

11. Developing a plan for how to most effectively utilize the adaptable space and functions of parks and schools to facilitate recovery, including the role they play as community gathering places.

12. Aligning the expectations, both internally and externally, about City bureaus' recovery priorities, expected timelines and core responsibilities (e.g., Water is responsible for restoring the City's drinking water system, not providing emergency bottled water; Environmental Services is not responsible for removing human waste from people's homes until the sewer system is operational; Transportation will be prioritizing repairs along emergency routes and major arterials, but not to County-owned bridges over the Willamette).

13. Creating a shared vision for how, following a major disaster, a smarter, more efficient and more equitable Portland could be rebuilt to help guide recovery decision-making, when there will be significant pressure to quickly make decisions.

14. Establishing a recovery governance council, structure, and guidelines for making decisions and investments during an extended recovery period — In other words, a decision-making structure between emergency response (Disaster Policy Council) and normal operations (City Council).

RIPE project team next steps

The RIPE project team is committed to pursuing the following near-term actions, including:

1. Pursuing resources for more resilience and recovery work, including additional grant funding from the Global Consortium for Sustainable Outcomes and other potential partners, as well as supporting efforts to secure additional internal City resources.
2. Sharing and expanding on the results of the RIPE workshops and this report with other City staff, bureau directors, external partners and City Council.
3. Establishing an interim collaboration structure facilitated by PSU's Institute for Sustainable Solutions and with representatives from the infrastructure bureaus, emergency management, planning and sustainability, and the budget office to further refine next steps and foster opportunities for collaboration.
4. Leveraging academic resources — including grant funding, applied research, internships, and class engagements — to augment and inform City staff efforts.

The findings outlined in this report, together with the potential actions and next steps outlined above, create the foundation from which City bureaus, Portland State University and other partners will advance and operationalize a robust resilience and recovery planning and investment program for the City's infrastructure systems. These efforts promise to pay big dividends not only following a disaster, but more immediately by creating opportunities for more informed decision-making and cross-bureau collaboration.

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Appendices

8.2.3.10 Emergency Transportation Routes Project

Lead agency	Partners	Proposed timing
Metro and Regional Disaster Preparedness Organization (RPDO)	Cities, counties, TriMet, SMART, ODOT, DOGAMI, WASHDOT, SW RTC, REMTEC	2019-20

Natural disaster can happen anytime, and the transportation system needs to be prepared to withstand them and to provide needed transport for fuel, essential supplies, and medical transport. The Emergency Transportation Routes (ETRs) project will aim to update the existing ETRs and MOU for the 5-county region in partnership with the Regional Disaster Preparedness Organization (RPDO). This project would apply a seismic resilience lens to update existing designated routes. The purpose of revisiting the existing ETR routes with a seismic lens is to evaluate whether the routes have a high likelihood of being damaged or cut-off during an earthquake and determine whether other routes may be better suited to prioritize as ETRs as a result.

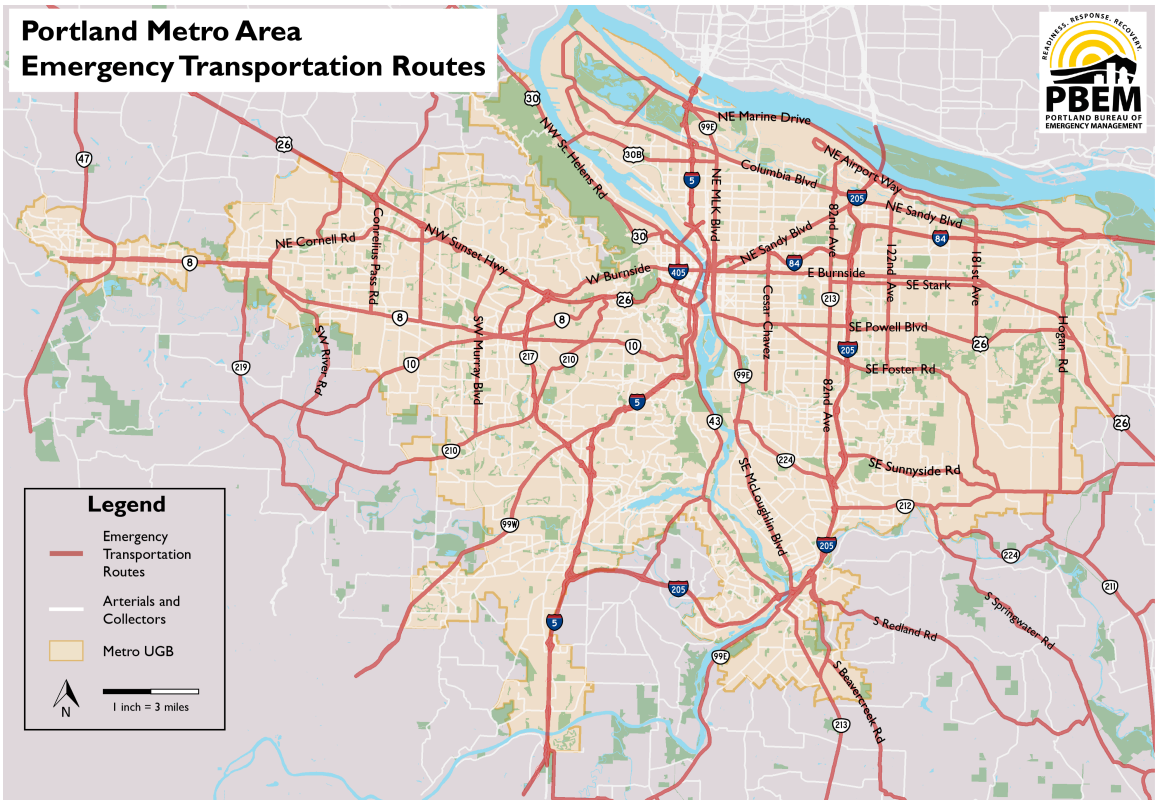

Figure 8.3 Designated Regional Emergency Transportation Routes (2006)

Since 2006, when the current ETRs were established with an MOU between Oregon Department of Transportation (ODOT), Washington State Department of Transportation (WSDOT), Metro and the local jurisdictions, advances have been made in our understanding of the seismic risks to our road infrastructure. The RDPO-funded Oregon

Department of Geology and Mineral Industries (DOGAMI) Enhanced Earthquake Impact Study (2017) assessed seismic vulnerability of bridges in the region. The Sellwood Bridge and Tillikum Crossing Bridge have been built to be seismically resilient. In addition, planning work is under way for a seismic retrofit of the Burnside Bridge. These updates need to be taken into consideration with the next ETR update.

The 2006 ETR MOU calls for an update every five years; however, more than ten years have passed. The MOU also establishes that REMTEC (also known as Regional Emergency Management Work Group) will take the lead to re-convene stakeholders to update the ETRs. REMTEC, a work group of the RPDO, helps develop the region's disaster preparedness capabilities through coordinated planning, training and investment in technology.

The ETR update will use updated earthquake impact analysis completed by DOGAMI in 2017 for Clackamas, Multnomah and Washington counties, and to be completed in 2018 for both Clark and Columbia Counties. The DOGAMI analysis shows anticipated impacts to existing ETRs in terms of liquefaction, ground deformation and landslide risks. Additional analysis with counties, TriMet, Washington State DOT and ODOT will incorporate anticipated seismic impacts to bridge infrastructure on the region's arterial streets and throughways.

Expected outcomes of the project include:

- Identification of criteria by which to evaluate the existing ETRs and any alternates that are proposed for adoption with the ETR update. ODOT considered seismic resiliency in establishment of their lifeline routes to which the ETRs must connect.
- A new MOU documenting the updated emergency transportation routes (ETR) on a map of the region. The updated MOU will define a reasonable time frame for periodic updates (perhaps extending the update from 5 years to 10 years, per recent practice). The MOU also will outline responsibilities of the agencies involved (Departments of Transportation, Metro, TriMet, C-Tran, SMART, RDPO, REMTEC, DOGAMI, etc.).
- Adoption of the updated ETRs in the Regional Transportation Plan.
- Information to support the critical facilities assessment and Regional Recovery Framework Project being developed by the RPDO and the Regional Debris Management Plan developed by Metro.

Given the time that has elapsed, and given the advances in our understanding of seismic risks and resilience in our transportation infrastructure, the time is right to update the ETRs. Updating the ETRs is strategic since Oregon House Bill 2017 dedicates $5.3 billion in seismic funding. The analysis from this project will support advocacy to direct transportation investments toward enhanced seismic resilience of our region's roads, bridges and transit and freight routes, increasing regional transportation resilience and security.

This work will be coordinated through the RPDO and appropriate RPDO work groups, emergency management staff from across the region, the Southwest Washington Regional Transportation Council and technical advisory committee, and Metro's technical and policy advisory committees. The project will also provide meaningful opportunities for public and other stakeholder input. The project may also make recommendations for future transportation resiliency planning efforts. Metro partnered with the RPDO to submit a grant application to help fund this work, which, if awarded, would allow this work to begin in summer 2019 pending sufficient resources.

Materials following this page were distributed at the meeting.

Transportation Resiliency and Emergency Preparedness Efforts in the Region

TPAC and MTAC Workshop

RDPO, PBEM, PSU and Metro

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Presentation Agenda

- Introductions
- Regional Disaster Preparedness Organization Overview– Denise Barrett, RDPO
- RDPO projects related transportation resilience and recovery – Laura Hanson, RDPO & Kim Ellis, Metro
- City of Portland's Transportation Recovery Plan – John MacArthur, PSU
- Portland's Resilient Infrastructure Planning Exercise – Jonna Papaefthimiou, PBEM
- DISCUSSION
- Q&A throughout

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RDPO Overview

Denise Barrett

RDPO Manager

RDPO

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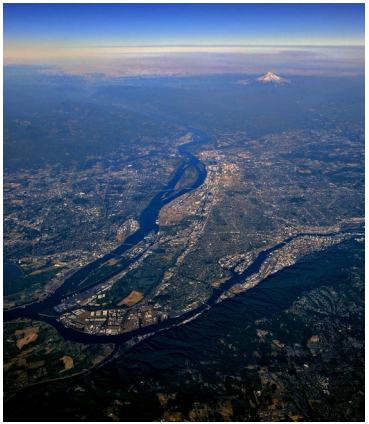
Regional Disaster Preparedness Org (RDPO)



Portland Metropolitan Region

(Clackamas, Columbia, Multnomah, Washington, Clark)

- Government agencies
- Non-governmental organizations
- Private-sector stakeholders

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RDPO IGA Signatories

Core Contributing Members:

- Counties: Clackamas, Columbia, Multnomah, Washington, and Clark
- Cities: Portland
- Regional Governments: Metro, Port of Portland, TriMet

Other Contributing Members:

- Cities: Gresham, Fairview, Troutdale, Wood Village, Beaverton, Hillsboro and Vancouver
- Special Districts/Inter-Locals: Regional Water Providers Consortium

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Secure & Disaster-Resilient Region

Local agencies, organizations, and communities are prepared and coordinated

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RDPO Mission (cont.)

Strategic and Coordinated:

- Planning
- Training and exercising
- Investment in technology & specialized equipment

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Guiding Principles

- Opportunities for organizations across the 5-county region to participate
- Regional perspective + jurisdictional autonomy
- Decision making through consensus
- Include all stakeholders through whole community approach
- National Preparedness Goal as guide

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Policy:

- Accountability, direction, political leadership

Steering:

- Direction, planning, oversight

Program:

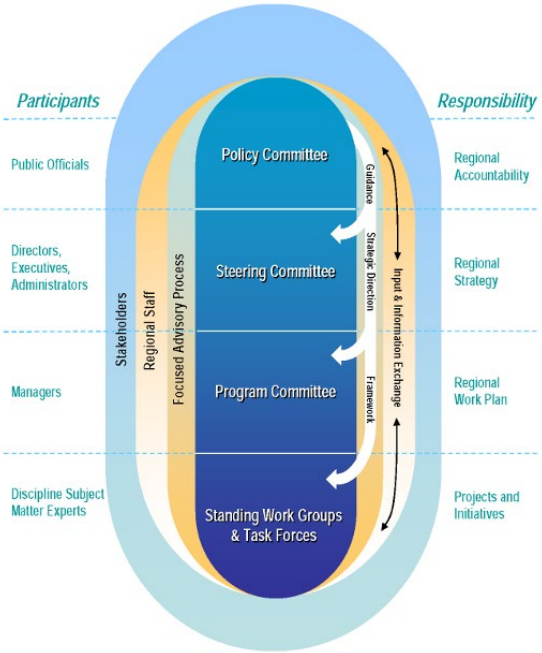
- Develop/monitor Work Plan, which is based on the RDPO Strategic Plan

Work Groups:

- Discipline-specific groups completing projects based on RDPO Strategic Plan

Task Forces:

- Time-limited projects requiring collaboration of several Discipline Work Groups



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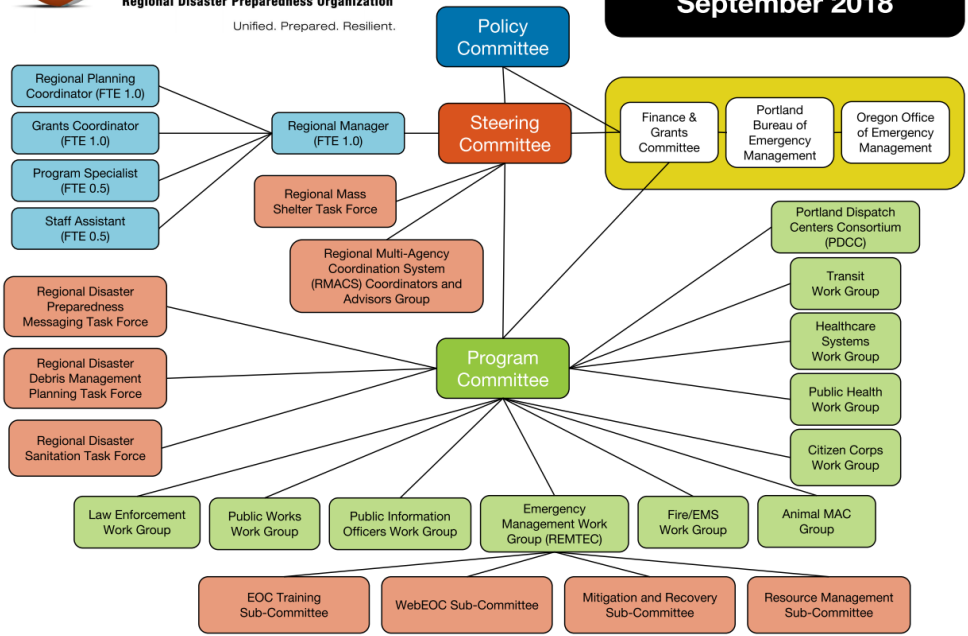
Organizational Chart September 2018



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RDPO Funding 

- Federal: Urban Area Security Initiative (UASI) funding

$7.6+ million [3 grants – FY'16, FY'17 and FY'18]

- Local: RDPO Member Contribution Funds

$264K (FY'18)

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Critical Transportation Core Capability

Planning (+ training & exercising)

- Regional Critical Infrastructure/Key Resource Planning (2007)
- Regional Disaster Debris Management Planning Framework (2013 – 2015) Training Workshops and TTX (2016)
- Regional MACS ConOps (2016)
- Regional Emergency Transportation Routes Update (2018-2019)
- Regional/Local Fuel Contingency Planning (2018 – 2019)
- Regional Recovery Framework (2018-2019)

Equipment:

- Emergency Response Vehicles, Variable Messaging Sign Boards, etc.
- Portable Water Treatment Plants; Potable Water Dispensing Units; Portable Emergency Piping. *[Transportation System-Utilities Interdependencies]*

Proposed:

- Regional Workshop/TTX: Portland EM Transportation Recovery Alternatives Prioritization Tool

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Transportation & Other Critical Infrastructure Resilience Advocacy / Support

- ODOT's FY'16 and FY'17 Fastlane Grant Applications *(Abernathy Bridge Seismic Retrofit)*
- Multnomah County's Earthquake Ready Burnside Bridge Project
- Oregon Multi-Modal Transportation RRAP (SRO)

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Projects Overview

Laura Hanson

RDPO Planning

RDPO

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Critical Transportation Core Capability

Planning (+ training & exercising)

- Regional Critical Infrastructure/Key Resource Planning (2007)
- Regional Disaster Debris Management Planning Framework (2013 – 2015)
  Training Workshops and TTX (2016)
- Regional MACS ConOps (2016)
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- Regional/Local Fuel Contingency Planning (2018 – 2019)
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  [Transportation System-Utilities Interdependencies]

Proposed:

- Regional Workshop/TTX: Portland EM Transportation Recovery Alternatives Prioritization Tool

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Fueling Anxiety TTX Scope

- One-day
- Discussion-based
- Establishment and coordination of an emergency fuel management system following a CSZ 9.0 earthquake
- Federal, state, local and private industry stakeholders
- Validate state and local plans
- Identify gaps and regional components

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Fueling Anxiety TTX: State Lesson learned Highlights

- State needs to establish pre-incident fuel allocation priorities to support life safety and critical infrastructure restoration
  - State fuel priorities should balance life safety issues in heavily damaged areas with the lifeline services restoration in lesser impacted areas
- State and counties need to establish consistent fuel request procedures for organizations operating in multiple counties
- Not all petroleum industry partners are aware of the state and county fuel management role during disasters
  - All 7 fuel terminals work closely with ODOE, but many fuel distributors do not
  - Most counties do not have established relationships with the fuel distributors

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After Action Report: Regional Perspective

Regional coordination and support to counties:

- Plan to incorporate regional organizations into fuel management strategies (RDPO, RMACs, Metro, etc.)
- Fuel request processes and documentation (link to resource request regional project)
- Public messaging strategies (Messaging TF) for fuel allocations to general public
- Assessment of fuel requirements to sustain critical operations (part of county planning)

With State/ODOE:

- Contracts with fuel distributors (both existing, and potential emergency contracts) – ODOE and local, with potential regional coordination
- Reconciling priorities – state and local, with regional coordination
- Coordination with critical infrastructure – fuel priorities and needs for utilities, hospitals, etc.

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Regional Fuel Planning Next Steps

- **TTX Lessons Learned**
  - All counties need a plan, but likely will be very different based on:
    - Threat
    - Fuel system capabilities (public and private)
    - Anticipated incident impacts
  - Start with comprehensive assessment and understanding of fuel system capabilities and needs
- SHSP funding for Multnomah and Clackamas Counties, fall 2018
- UASI money from RDPO to **regionalize the planning effort**, spring 2019

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Regional Recovery Framework

Project Goals

- Build a Regional Recovery Framework for the Portland Metropolitan Region that will **provide a roadmap** for rebuilding a stronger, more cohesive community after a catastrophic event
- **Work together as a region**, including stakeholders from the cities and counties, to develop the Regional Recovery Framework
- **Identify regional recovery priorities** to ensure a smoother and more equitable recovery process

Key Project Deliverables

- Existing Capabilities and Best Practices Memo
- Stakeholder and Steering Committee Planning Workshops
- Recovery Support Function Workshops
- **Regional Recovery Framework**
- 5 County Annexes

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The Seven Recovery Support Functions		
	Community Planning and Capacity Building	Unifies and coordinates expertise and assistance programs between both governmental as well as non-governmental partners to ensure engagement of the whole community in planning and managing recovery.
	Land Use and Redevelopment Planning	Guides physical development following an incident to determine how and where to build, rebuild, vacate, and which areas to preserve.
	Economic Recovery	Helps levels of government and the private sector sustain or rebuild businesses and employment.
	Health and Social Services	Supports recovery in public health, healthcare facilities and coalitions, and essential social services.
	Housing	Coordinates resources for adequate, affordable, equitable, and accessible housing to support the whole community.
	Infrastructure Systems	Helps restore infrastructure systems and services and improves resilience to future hazards.
	Natural and Cultural Resources	Works to protect and restore natural and cultural resources and historic properties.

Regional Recovery Conference & Other Engagement

- January or February 2019: 2 Day Recovery Conference
- Plenary speakers on topics including recovery case studies, infrastructure interdependencies, and more

- Webinars in advance (December)
- Monthly Newsletter (get on mailing list)
- Visit our website: www.regionalrecovery.org

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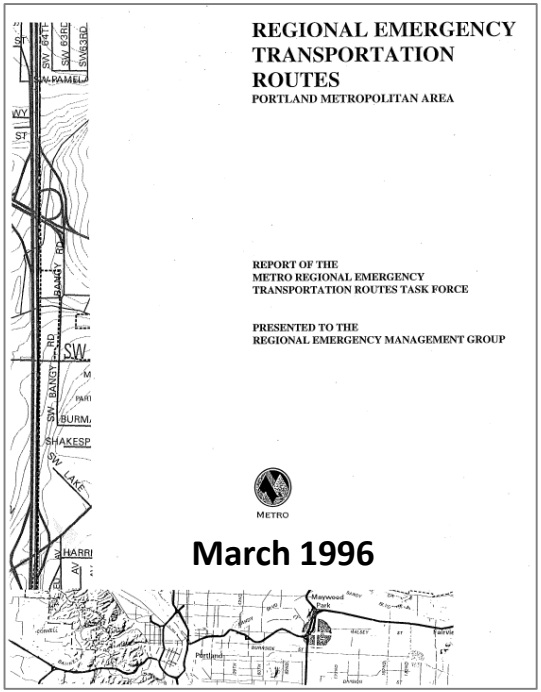
Emergency Transportation Routes (ETRs)
A brief history

- Multi-jurisdictional Regional Emergency Management Group (REMG) formed in 1994
- Metro facilitated REMG's initial transportation work
- coordination focused on disaster preparedness and response
- Primary ETR routes defined to prioritize hazard mitigation and response efforts in region

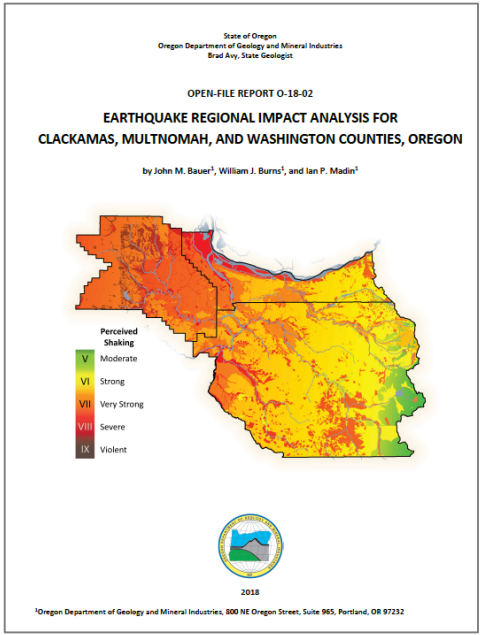


Emergency Transportation Routes (ETRs)
More recent work

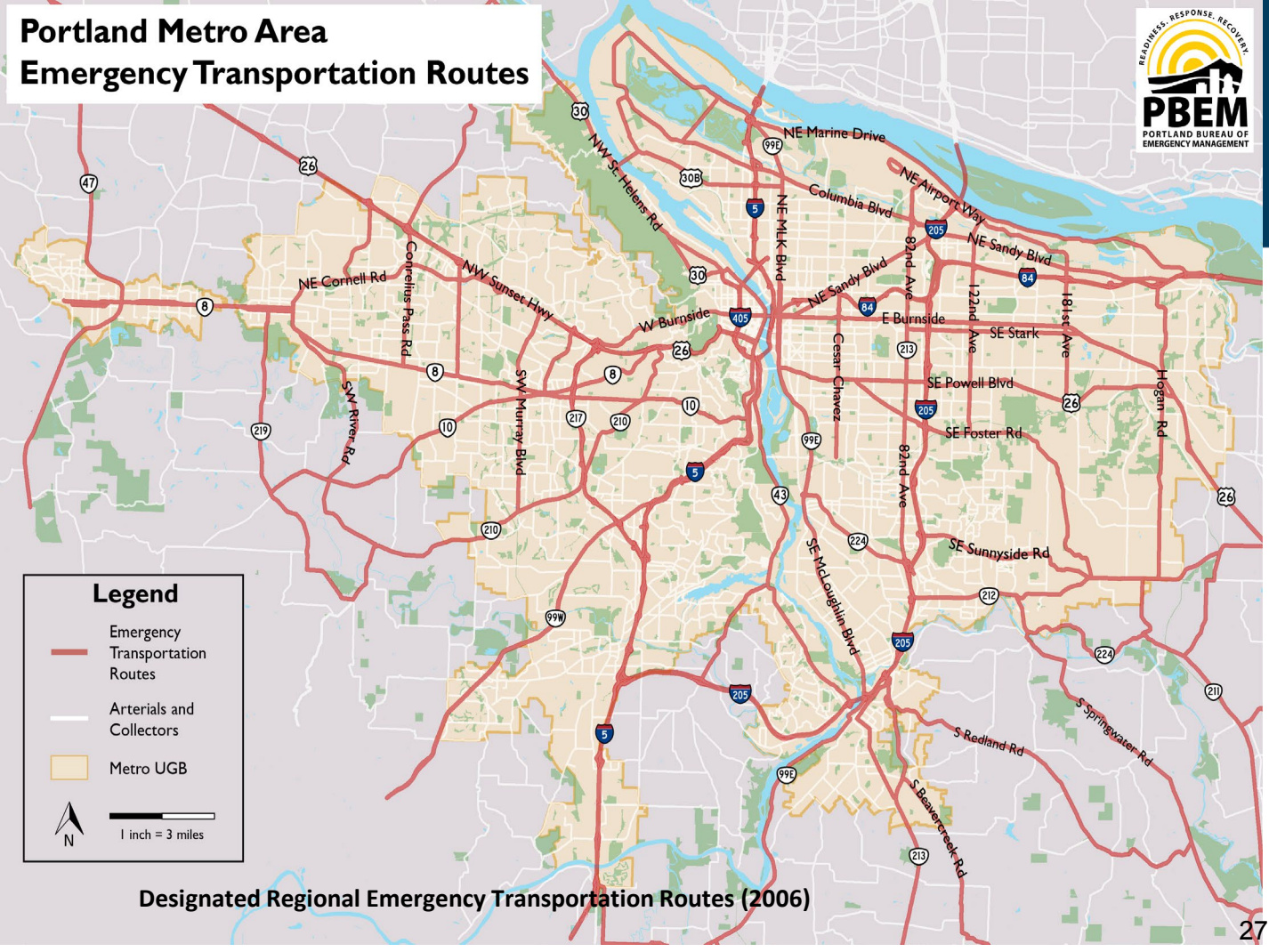
- Last update 2006, Metro-led
- MOU: REMTEC committee of RDPO will coordinate updates every 5 years
- ODOT State Lifeline Routes included seismic considerations, the Portland metro region ETRs did not
- ODOT working with counties (Clackamas, Columbia, Washington) to update seismic priorities for ETRS or alternatives (investing in bridges)
- PBOT also updated ETRs summer 2018

Emergency Transportation Routes (ETRs)
Seismic Update Project 2019

- partnership with the Regional Disaster Preparedness Organization
- build on updated earthquake analysis completed by DOGAMI
- reflect bridges that have been built/updated to be seismically resilient
- map vulnerable locations and emergency routes on regional transportation system
- prioritize routes for investment



Portland Metro Area
Emergency Transportation Routes



Designated Regional Emergency Transportation Routes (2006)

Desired outcomes from planning process

work with REMTEC (RPDO work group) update the existing ETRs and adopt them in the RTP

apply a seismic resilience lens to update existing designated routes

develop new MOU for future updates and data management

develop recommendations for future work and collaboration around transportation resilience and recovery

Next steps

- review ETR work completed to date by ODOT and counties
- develop scope of work, timeline and engagement plan (Jan. – June ’19)

Transportation Recovery Plan

John MacArthur
Portland State University (PSU)

Portland All-hazards Transportation Recovery Plan

TPAC Committee Meeting: November 7, 2018

John MacArthur
Portland State University

PBEM Portland State UNIVERSITY TY LIN INTERNATIONAL engineers | planners | scientists SGA

Smart, Shared and Social: Enhancing All-Hazards Recovery Plans with Demand Management Technologies

- **Develop and test an emergency recovery plan using transit and TDM for the Portland, Oregon region.** The plan will identify opportunities to improve emergency recovery planning using transit and TDM and leveraging social media and ITS applications to improve recovery time and travel options.
- **Finalize Portland emergency recovery plan.** Revisions to draft plan will be based upon input during the table top exercises and testing phase.
- **Develop and provide a training course that will equip six other regions in developing comprehensive emergency recovery plans**
- **Provide training using the above course materials, conduct two-day training workshops in six cities**

Partners


TRIMET


PBEM


CITY OF PORTLAND OREGON
1851


PBOT
PORTLAND BUREAU OF TRANSPORTATION


Oregon
Department
of Transportation


Metro


Multnomah
County


PORT OF PORTLAND


RDPO
Regional Disaster Preparedness Organization
Unified. Prepared. Resilient.


OREGON
HEALTH
&SCIENCE
UNIVERSITY
OHSU


GO LLOYD
MOVING. CONNECTING. GROWING.

Five Phases of Emergency Management

Recap Efforts

- Hazards scope – Earthquakes, Landslides, Floods, Homeland Security
- Data Collection & Interviews
- Focused on ETRs / Employment Centers
- Tabletop Exercises
- Regional Pilot Training
- Deliverables – Plan, APT and Employer TDM Transportation Recovery Guide

Objectives

- Evaluate the transition between emergency response and recovery, looking at the role of Emergency Transportation Routes, Damage Assessment, and Debris Management, in accordance with plan framework:

> Recovery is the process of restoring the reasonably expected economic and social functions of a community following a natural or human-induced hazard event. **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.

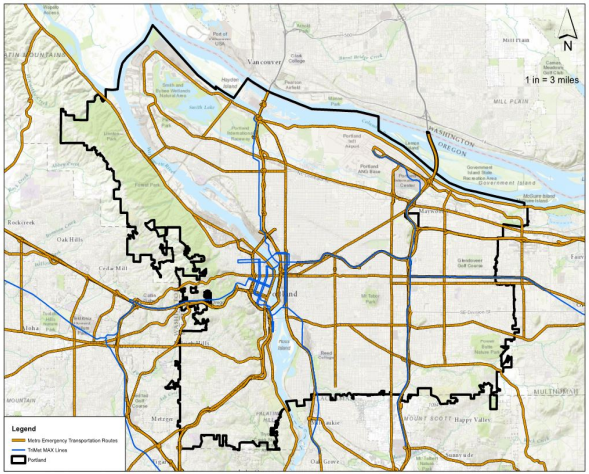
Objectives continued

- Assess the prioritization of restoring active transportation and transit routes, draft alternatives prioritization tool, and planning processes that can inform what it means to rebuild better:

> **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 event and implement planned improvements where possible subject to timing and funding constraints. This will ensure that opportunities to increase safety, reliability, efficiency, resiliency, and equity are fully maximized.

Plan Focus:

ETRs & Employment Centers



Employment Centers
Downtown Portland
Lloyd District
OHSU District
PDX/POP Marine Terminals
Gateway District

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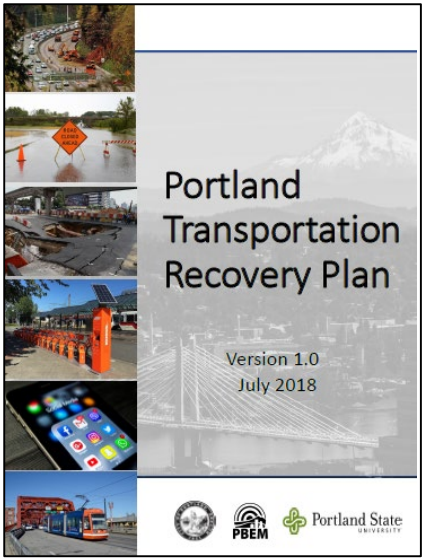
Discussion of Products

The Transportation Recovery Plan



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Transition from Response to Recovery

Recovery Stages & High-Level Activities

Stage 1

- Oversee and schedule continued debris clearance from ETRs and other routes for transit, bicycle, and pedestrian mobility (City)
- Develop transit service recovery plans (TriMet)
- Assess and ration fuel supplies appropriately (City, TriMet, State)
- Communicate available travel routes and options (City, TriMet, County, State)
- Initiate pre-planned TDM strategies and regulations (City, TriMet, employers)
- Begin developing service plans for seniors and persons with disabilities (TriMet, FTA 5310 recipients)
- Develop fleet and staffing level needs for Stage 2 for review by emergency transportation recovery group (City, TriMet, County, State)

Stage 2

- Oversee and schedule debris clearance from Fire Management Area Emergency Routes and continue for ETRs and other routes for transit, bicycle, and pedestrian mobility (City)
- Update transit service recovery plans based on anticipated Stage 3 conditions (TriMet)
- Develop fleet and staffing level needs based on anticipated Stage 3 for review by emergency transportation recovery group (City, TriMet, County, State)

Ongoing

- Continue assessing and rationing fuel supplies appropriately (City, TriMet, State)
- Communicate available travel routes and options (City, TriMet, County, State)
- Maintain/expand/reduce TDM strategies and regulations as appropriate (City, TriMet, employers)
- Maintain/expand services for seniors and persons with disabilities as appropriate (TriMet, FTA 5310 recipients)

Stage 3

- Oversee and schedule debris clearance rom MAX, streetcar, and frequent bus service routes and stops and continue for ETRs and other routes for transit, bicycle, and pedestrian mobility, and Fire Management Area Emergency Routes (City)
- Update transit service recovery plans based on anticipated Stage 4 conditions (TriMet)
- Develop fleet and staffing level needs based on anticipated Stage 4 for review by emergency transportation recovery group (City, TriMet, County, State)

Ongoing

- Continue assessing and rationing fuel supplies appropriately (City, TriMet, State)
- Communicate available travel routes and options (City, TriMet, County, State)
- Maintain/expand/reduce TDM strategies and regulations as appropriate (City, TriMet, employers)
- Maintain/expand services for seniors and persons with disabilities as appropriate (TriMet, FTA 5310 recipients)

Stage 4

- Restore pre-event transit services to the maximum extent practical (TriMet)
- Develop fleet and staffing level needs for Stage 2 for future restoration of services for review by emergency transportation recovery group (City, TriMet, County, State)
- Conduct assessment of receovery actions and prepare "lessons learned" analysis, including recommendations for new services (City, TriMet, County, State)

Ongoing

- Continue debris clearance from MAX, streetcar, and frequent bus service routes and stops and continue for ETRs and other routes for transit, bicycle, and pedestrian mobility, and Fire Management Area Emergency Routes (City)
- Communicate available travel routes and options (City, TriMet, County, State)
- Maintain/expand/reduce TDM strategies and regulations as appropriate (City, TriMet, employers)
- Maintain/expand services for seniors and persons with disabilities as appropriate (TriMet, FTA 5310 recipients)

Figure 5.1 Recovery Stages & High-Level Activities

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Transition from Response to Recovery

	Recovery Stage 1	Recovery Stage 2	Recovery Stage 3	Recovery Stage 4
1. Communications Framework				
2. Infrastructure Assessment/Repairs				
3. Transit Service Planning and Coordination				
4. Transportation Demand Management				
5. Vulnerable Populations				
6. Legal Framework Contracting Options and				
7. Plan Evaluation, Updates and Training				

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

Checklist

- Advance Planning/Preparation
- Coordination and Collaboration
- Execution

Roles & Responsibilities

- Establish a Disaster Recovery Office

Prosper Portland	Bureau of Planning and Sustainability	Office of Community & Civic Like	Support from PBEM

- Form a Transportation Recovery Plan Working Group (TRPWG)

Lead - PBOT			
Port of Portland	ODOT	TriMet	Multnomah Co
Metro	RDPO	Stakeholders	

- TRPWG manages the transportation recovery plan & planning activities and during recovery evaluates conditions, coordinates with other recovery efforts, determines priorities, identifies regulatory/labor/equipment reqs, implements and monitors recovery actions

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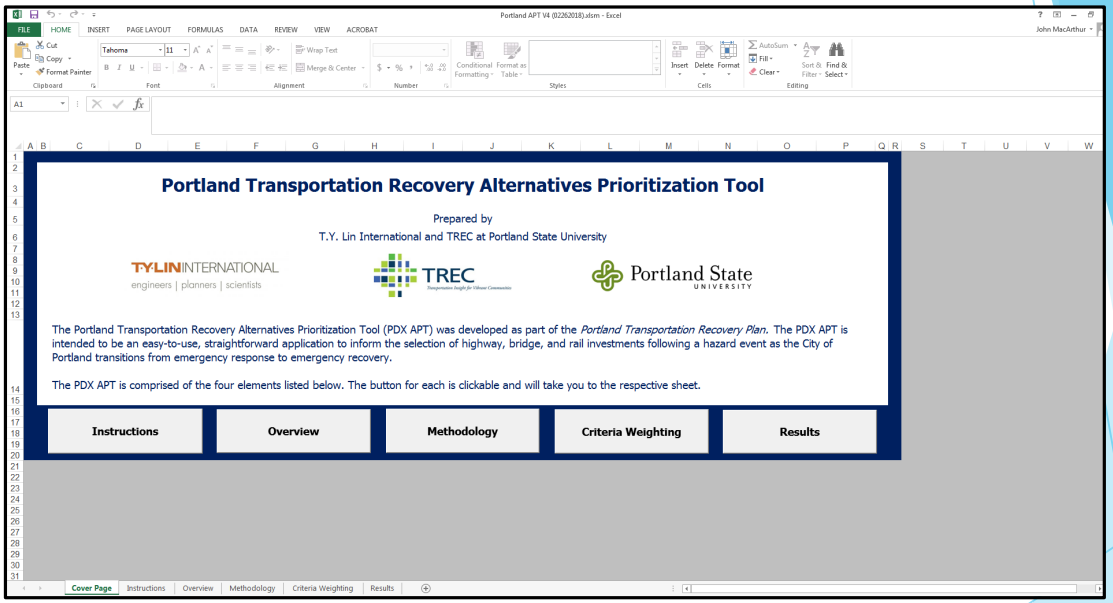
Alternatives Prioritization Tool



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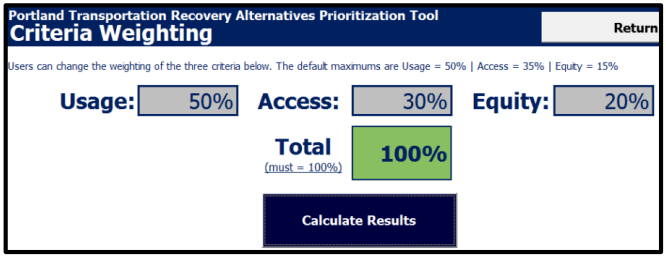
APT Scoring Methodology

- Scoring methodology includes
  - Roadways, transit, bikeways, pedestrian facilities
  - Three major performance categories (**Usage, Access, Equity**) with 19 criteria
  - Total maximum score of 100 points
- Portland participants established criteria, scores and weighting



- Purpose: to help agencies post-disaster to prioritize needed investments and phasing strategies

Three Performance Categories, 19 Criteria

Performance Category	Usage (up to 50 points)	Access (up to 35 points)	Equity (up to 15 points)
Criterion and points	MAX Light Rail Service or Portland Streetcar (50 pts)	Centers & Corridors (20 pts max)	Minority/Persons of Color Served (3 pts max)
	PBOT Traffic Classification (45 pts max)	Hospitals (3 pts)	Low income Persons Served (3 pts max)
	• PBOT Transit Classification (high capacity transit is a priority)	Fire Stations (3 pts)	Persons with Disabilities Served (3 pts max)
	• PBOT Bikeway Classification (various scores depending on facility)	Police Stations (3 pts)	Persons with Poor vehicle access Served (3 pts max)
	• PBOT Pedestrian Classification (various scores depending on facility)	PBEM Tier I critical Facilities (2 pts)	Persons with Limited English Proficiency Served (3 pts max)
	• PBOT Freight Classification (various scores depending on facility)	L:arge Employers (2 pts)	
	• Emergency Transportation Route (ETR) (5 pts. Max)	BEECN Location (earthquake comm node) (2 pts)	

Outputs

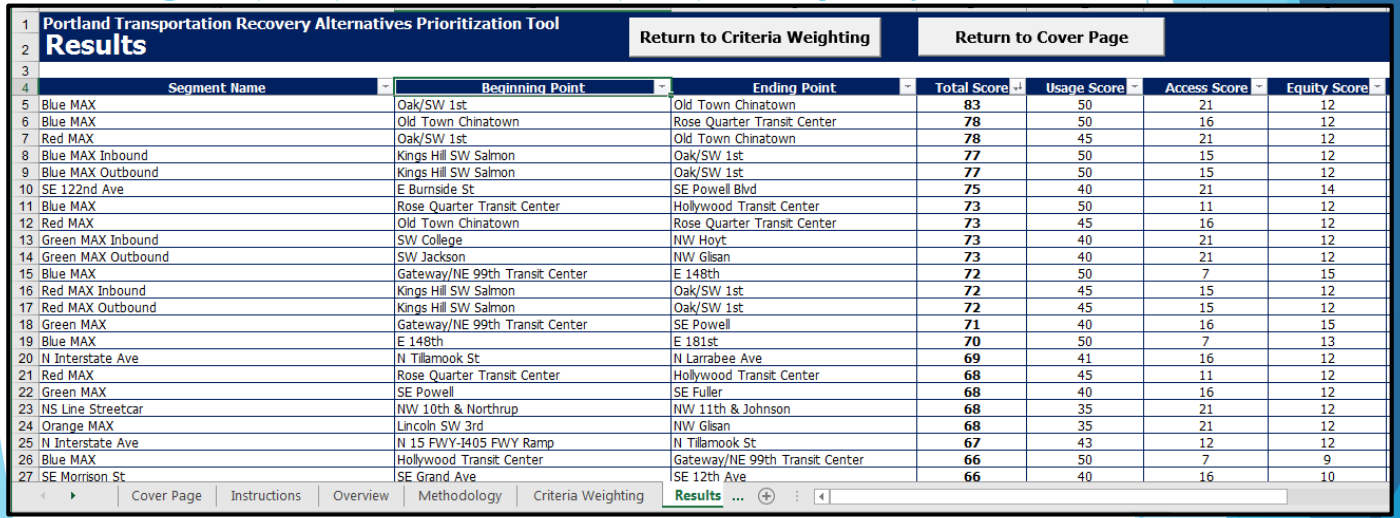
Ranked listing of facilities based on scoring methodology

- Users will assign current capability:
  Closed, Restricted Use, Unrestricted Use
- Results will be sortable to remove those
  with Unrestricted Use

Proposed design and cost if currently programmed

- Long range plans (City TSP, Metro RTP)
- Near-term capital improvement programs
  (City CIP, Metro TIP, ODOT STIP)

APT Scenario 1
Usage (50); Access (30); Equity



Portland Transportation Recovery Alternatives Prioritization Tool

Results

Return to Criteria Weighting | Return to Cover Page

Segment Name	Beginning Point	Ending Point	Total Score	Usage Score	Access Score	Equity Score
Blue MAX	Oak/SW 1st	Old Town Chinatown	**83**	50	21	12
Blue MAX	Old Town Chinatown	Rose Quarter Transit Center	**78**	50	16	12
Red MAX	Oak/SW 1st	Old Town Chinatown	**78**	45	21	12
Blue MAX Inbound	Kings Hill SW Salmon	Oak/SW 1st	**77**	50	15	12
Blue MAX Outbound	Kings Hill SW Salmon	Oak/SW 1st	**77**	50	15	12
SE 122nd Ave	E Burnside St	SE Powell Blvd	**75**	40	21	14
Blue MAX	Rose Quarter Transit Center	Hollywood Transit Center	**73**	50	11	12
Red MAX	Old Town Chinatown	Rose Quarter Transit Center	**73**	45	16	12
Green MAX Inbound	SW College	NW Hoyt	**73**	40	21	12
Green MAX Outbound	SW Jackson	NW Glisan	**73**	40	21	12
Blue MAX	Gateway/NE 99th Transit Center	E 148th	**72**	50	7	15
Red MAX Inbound	Kings Hill SW Salmon	Oak/SW 1st	**72**	45	15	12
Red MAX Outbound	Kings Hill SW Salmon	Oak/SW 1st	**72**	45	15	12
Green MAX	Gateway/NE 99th Transit Center	SE Powell	**71**	40	16	15
Blue MAX	E 148th	E 181st	**70**	50	7	13
N Interstate Ave	N Tillamook St	N Larrabee Ave	**69**	41	16	12
Red MAX	Rose Quarter Transit Center	Hollywood Transit Center	**68**	45	11	12
Green MAX	SE Powell	SE Fuller	**68**	40	16	12
NS Line Streetcar	NW 10th & Northrup	NW 11th & Johnson	**68**	35	21	12
Orange MAX	Lincoln SW 3rd	NW Glisan	**68**	35	21	12
N Interstate Ave	N 15 FWY-I405 FWY Ramp	N Tillamook St	**67**	43	12	12
Blue MAX	Hollywood Transit Center	Gateway/NE 99th Transit Center	**66**	50	7	9
SE Morrison St	SE Grand Ave	SE 12th Ave	**66**	40	16	10

Cover Page | Instructions | Overview | Methodology | Criteria Weighting | Results ...

APT Scenario 2
Usage (80); Access (10); Equity (10)

Portland Transportation Recovery Alternatives Prioritization Tool

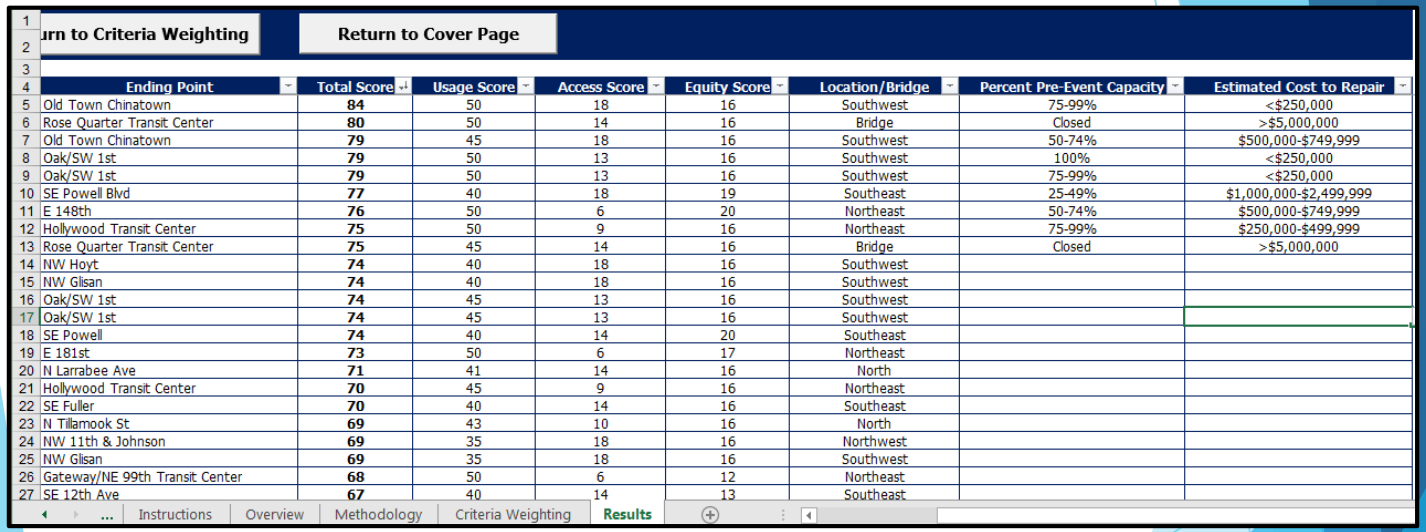
Results

Return to Criteria Weighting | Return to Cover Page

Segment Name	Beginning Point	Ending Point	Total Score	Usage Score	Access Score	Equity Score
Blue MAX	Oak/SW 1st	Old Town Chinatown	**94**	80	6	8
Blue MAX	Old Town Chinatown	Rose Quarter Transit Center	**93**	80	5	8
Blue MAX Inbound	Kings Hill SW Salmon	Oak/SW 1st	**92**	80	4	8
Blue MAX Outbound	Kings Hill SW Salmon	Oak/SW 1st	**92**	80	4	8
Blue MAX	Gateway/NE 99th Transit Center	E 148th	**92**	80	2	10
Blue MAX	Rose Quarter Transit Center	Hollywood Transit Center	**91**	80	3	8
Blue MAX	E 148th	E 181st	**91**	80	2	9
Blue MAX	Hollywood Transit Center	Gateway/NE 99th Transit Center	**88**	80	2	6
Red MAX	Oak/SW 1st	Old Town Chinatown	**86**	72	6	8
Red MAX	Old Town Chinatown	Rose Quarter Transit Center	**85**	72	5	8
Red MAX Inbound	Kings Hill SW Salmon	Oak/SW 1st	**84**	72	4	8
Red MAX Outbound	Kings Hill SW Salmon	Oak/SW 1st	**84**	72	4	8
Red MAX	Rose Quarter Transit Center	Hollywood Transit Center	**83**	72	3	8
Blue MAX	Sunset Transit Center	Kings Hill SW Salmon	**83**	80	3	0
Red MAX	Gateway/NE 99th Transit Center	Portland Airport	**81**	72	2	7
N Interstate Ave	N 15 FWY-I405 FWY Ramp	N Tillamook St	**80**	69	3	8
Red MAX	Hollywood Transit Center	Gateway/NE 99th Transit Center	**80**	72	2	6
SE 122nd Ave	E Burnside St	SE Powell Blvd	**79**	64	6	9
Green MAX	Gateway/NE 99th Transit Center	SE Powell	**79**	64	5	10
N Interstate Ave	N Tillamook St	N Larrabee Ave	**78**	66	5	8
Green MAX Inbound	SW College	NW Hoyt	**78**	64	6	8
Green MAX Outbound	SW Jackson	NW Glisan	**78**	64	6	8
Broadway Bridge	NW Lovejoy St	N Interstate Ave	**77**	67	2	8

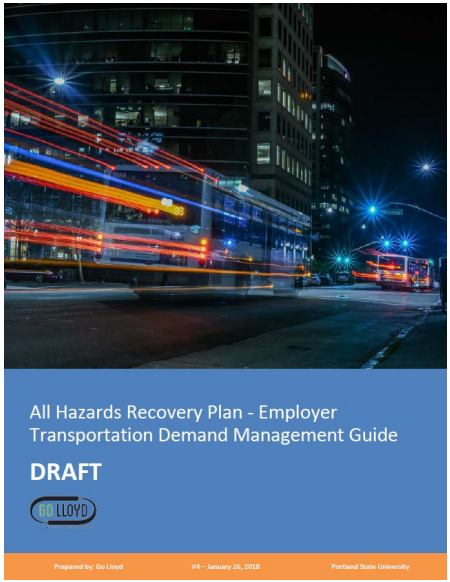
... | Instructions | Overview | Methodology | Criteria Weighting | **Results**

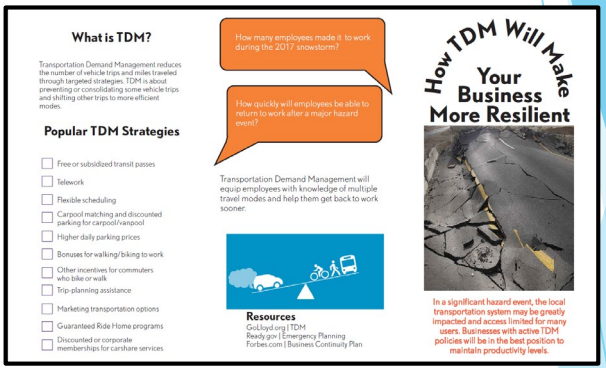
APT: Capacity and Cost



Ending Point	Total Score	Usage Score	Access Score	Equity Score	Location/Bridge	Percent Pre-Event Capacity	Estimated Cost to Repair
Old Town Chinatown	**84**	50	18	16	Southwest	75-99%	<$250,000
Rose Quarter Transit Center	**80**	50	14	16	Bridge	Closed	>$5,000,000
Old Town Chinatown	**79**	45	18	16	Southwest	50-74%	$500,000-$749,999
Oak/SW 1st	**79**	50	13	16	Southwest	100%	<$250,000
Oak/SW 1st	**79**	50	13	16	Southwest	75-99%	<$250,000
SE Powell Blvd	**77**	40	18	19	Southeast	25-49%	$1,000,000-$2,499,999
E 148th	**76**	50	6	20	Northeast	50-74%	$500,000-$749,999
Hollywood Transit Center	**75**	50	9	16	Northeast	75-99%	$250,000-$499,999
Rose Quarter Transit Center	**75**	45	14	16	Bridge	Closed	>$5,000,000
NW Hoyt	**74**	40	18	16	Southwest		
NW Glisan	**74**	40	18	16	Southwest		
Oak/SW 1st	**74**	45	13	16	Southwest		
Oak/SW 1st	**74**	45	13	16	Southwest		
SE Powell	**74**	40	14	20	Southeast		
E 181st	**73**	50	6	17	Northeast		
N Larrabee Ave	**71**	41	14	16	North		
Hollywood Transit Center	**70**	45	9	16	Northeast		
SE Fuller	**70**	40	14	16	Southeast		
N Tillamook St	**69**	43	10	16	North		
NW 11th & Johnson	**69**	35	18	16	Northwest		
NW Glisan	**69**	35	18	16	Southwest		
Gateway/NE 99th Transit Center	**68**	50	6	12	Northeast		
SE 12th Ave	**67**	40	14	13	Southeast		

Employer TDM Transportation Recovery Guide





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Suggested Follow-on Activities

- Continued Coordination of TRPWG – *every 6 months*
- Plan Modifications and Updates - *minimum every 5 years*
- Tabletop Exercise - *every 2 years*
- ETR Updates
- Create the Framework for a Disaster Recovery Office - *with description of powers, structure and staffing, oversight, and disbandment*
- Economic Impact Assessment - *quantify potential economic impacts to support investments in resilient infrastructure prior to an event*
- Comprehensive City Recovery Plan - *recommend determining a all-recovery framework for the City/Region*
- *Emerging Technologies*
- *Freight*

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Questions

RIPE: Resilient Infrastructure Planning Exercise

Jonna Papefthimiou

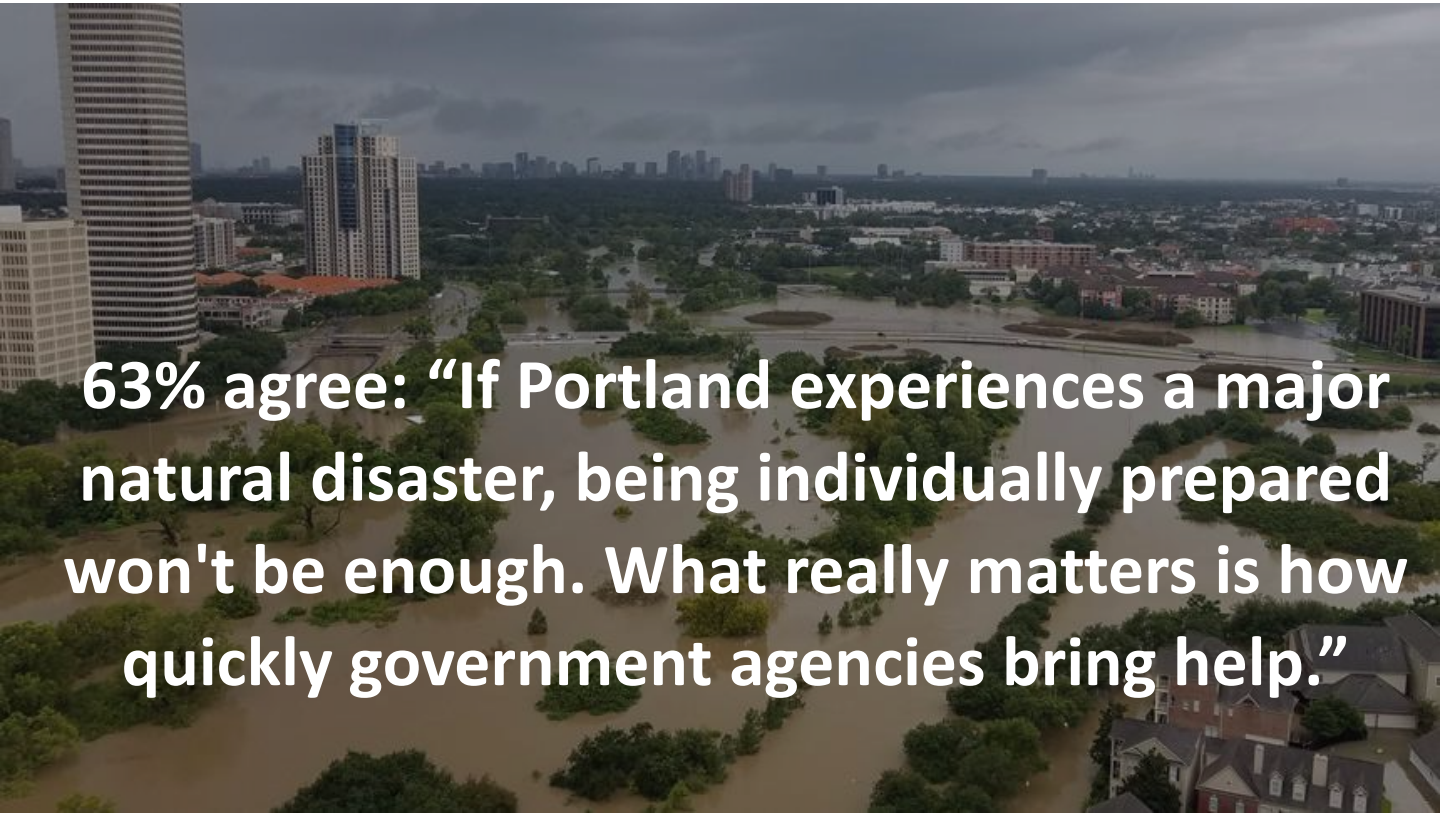
Portland Bureau of Emergency Management (PBEM)

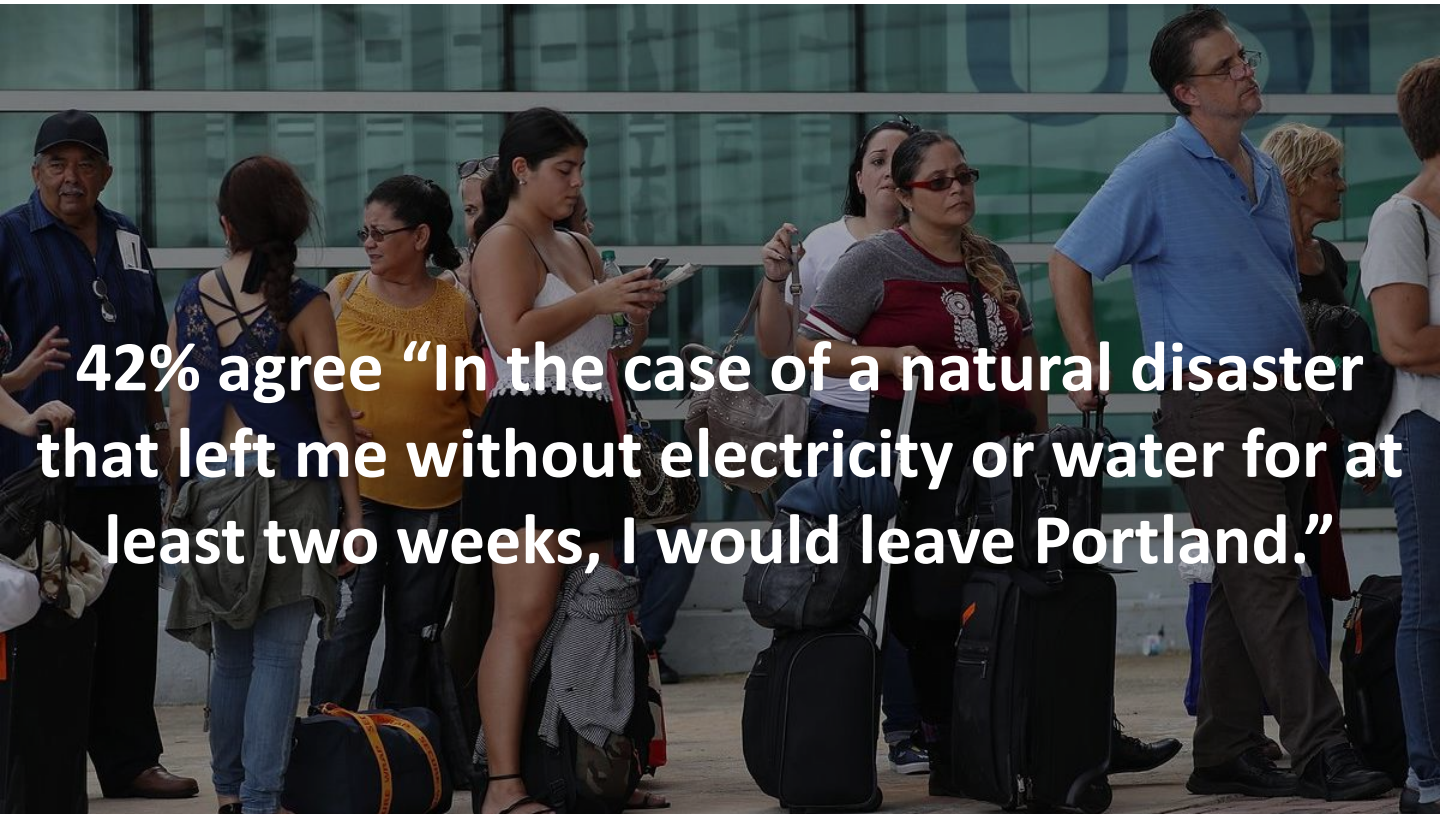
RIPE

Resilient
Infrastructure
Planning Exercise

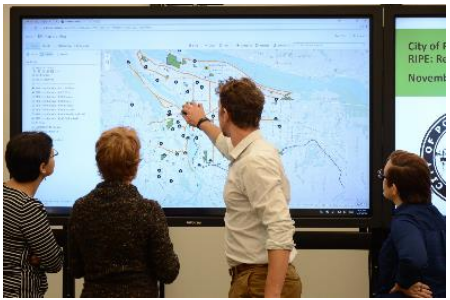

74% of Portlanders believe a natural disaster will occur in Portland in the next ten years.

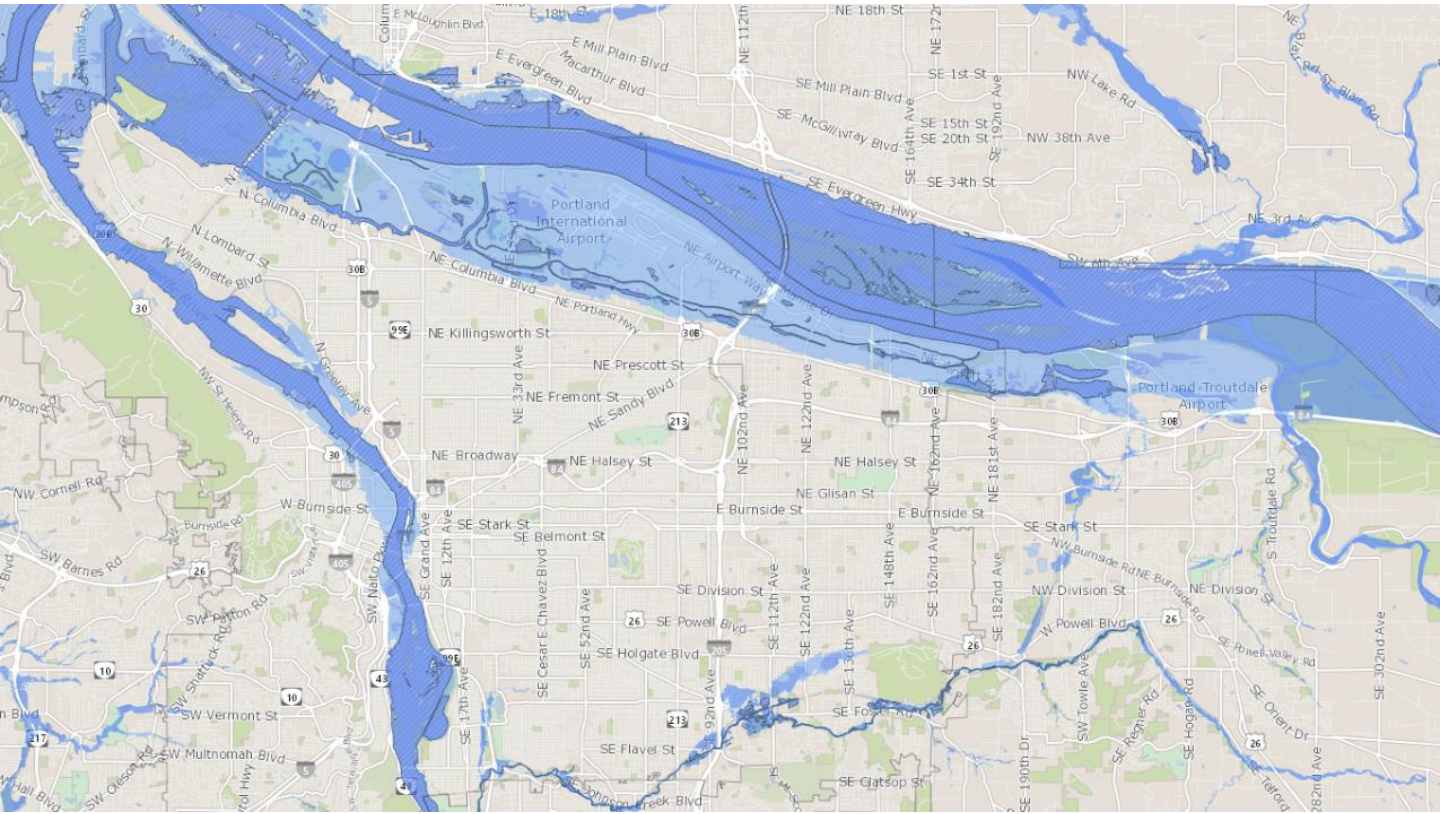
83% believe local responders will assist them within three days of a major emergency.


63% agree: “If Portland experiences a major natural disaster, being individually prepared won't be enough. What really matters is how quickly government agencies bring help.”


42% agree “In the case of a natural disaster that left me without electricity or water for at least two weeks, I would leave Portland.”

PSU's Data Visualization Studio

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Portland International Airport
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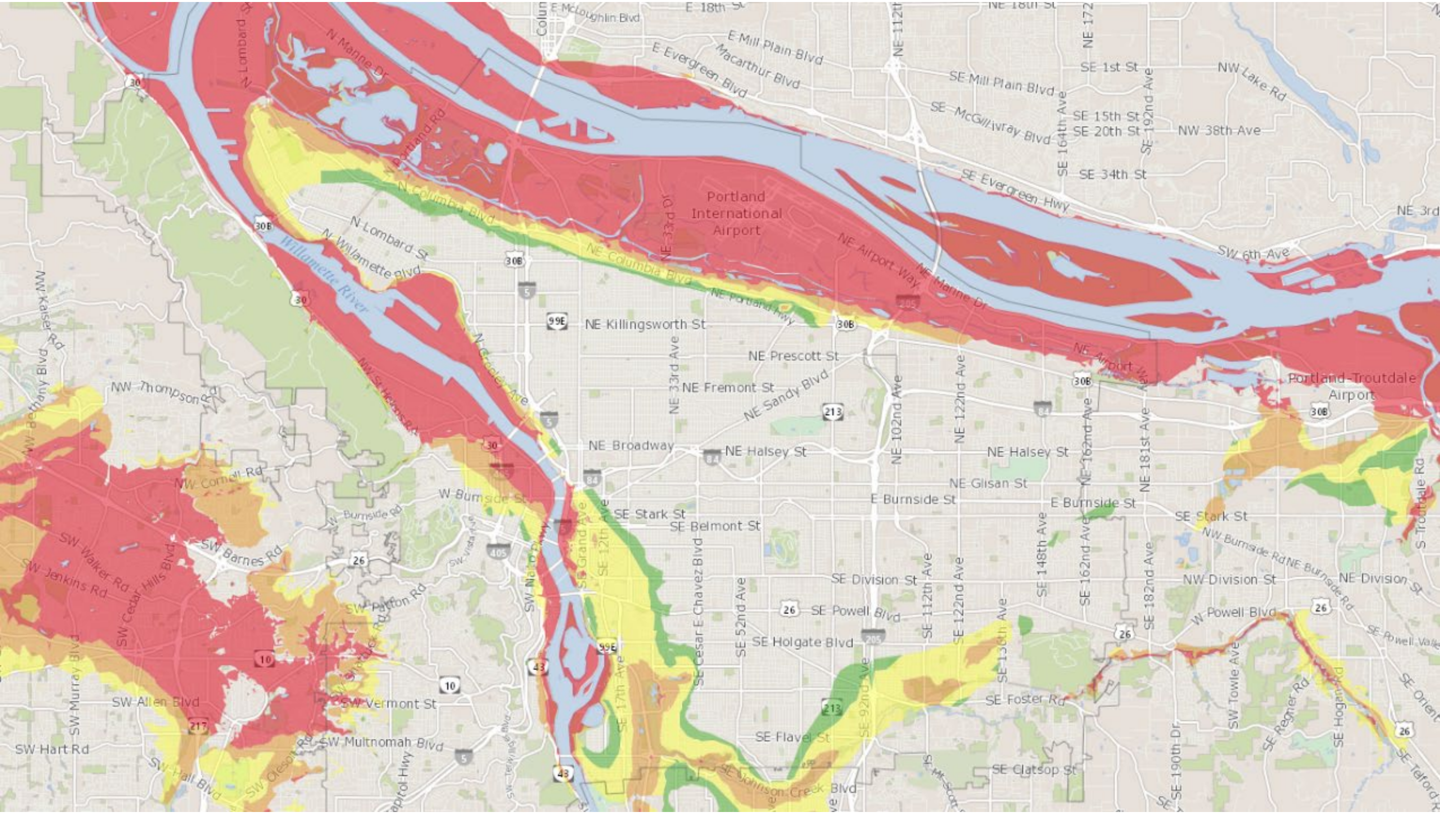
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SE Clatsop St
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SW Hall Blvd
SW Oleson Rd
SE Johnson Creek Blvd

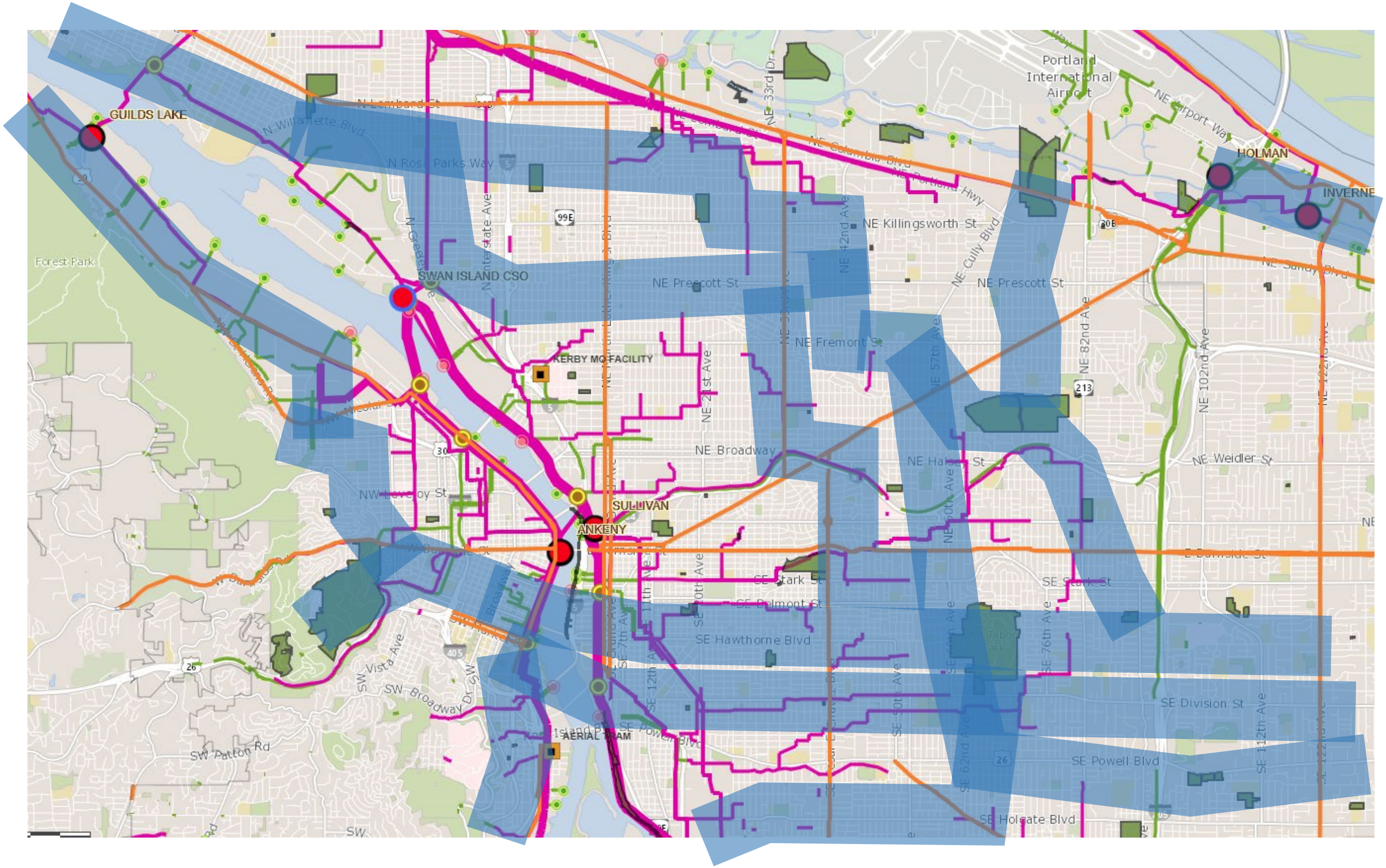
Within Bureaus

Across Bureaus

PBOT

BES

Water and Parks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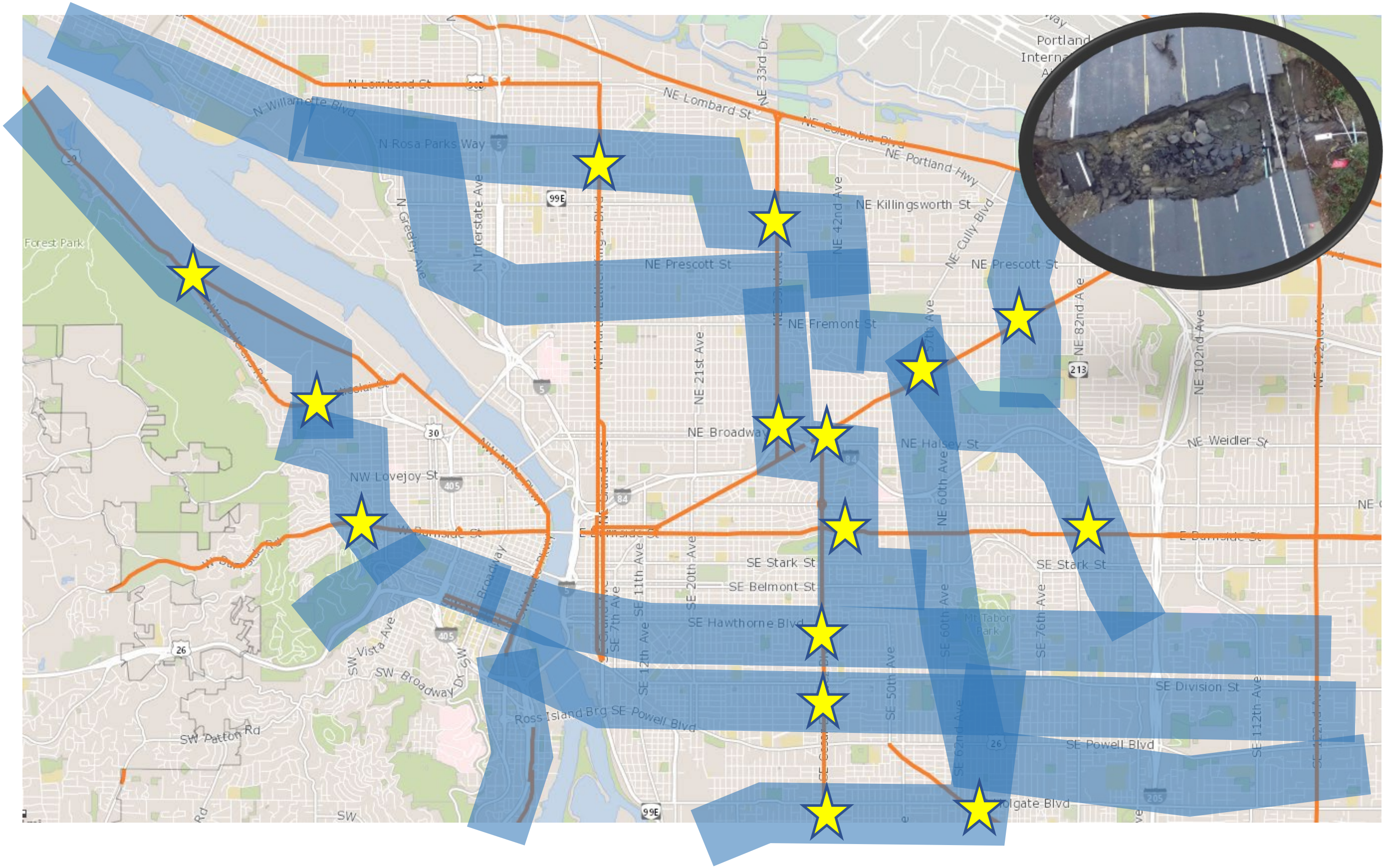
Infrastructure failures can cascade, compounding problems.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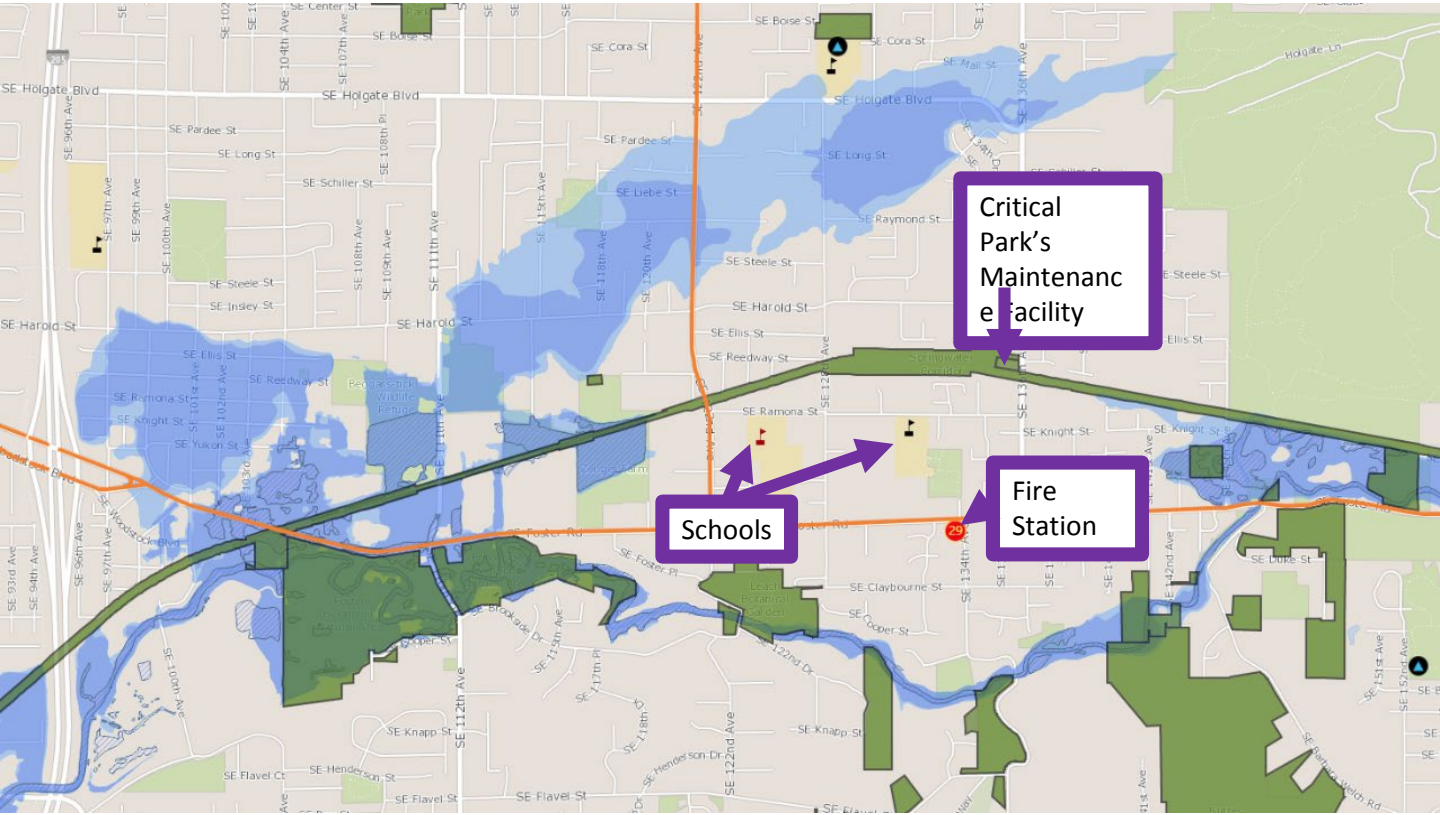
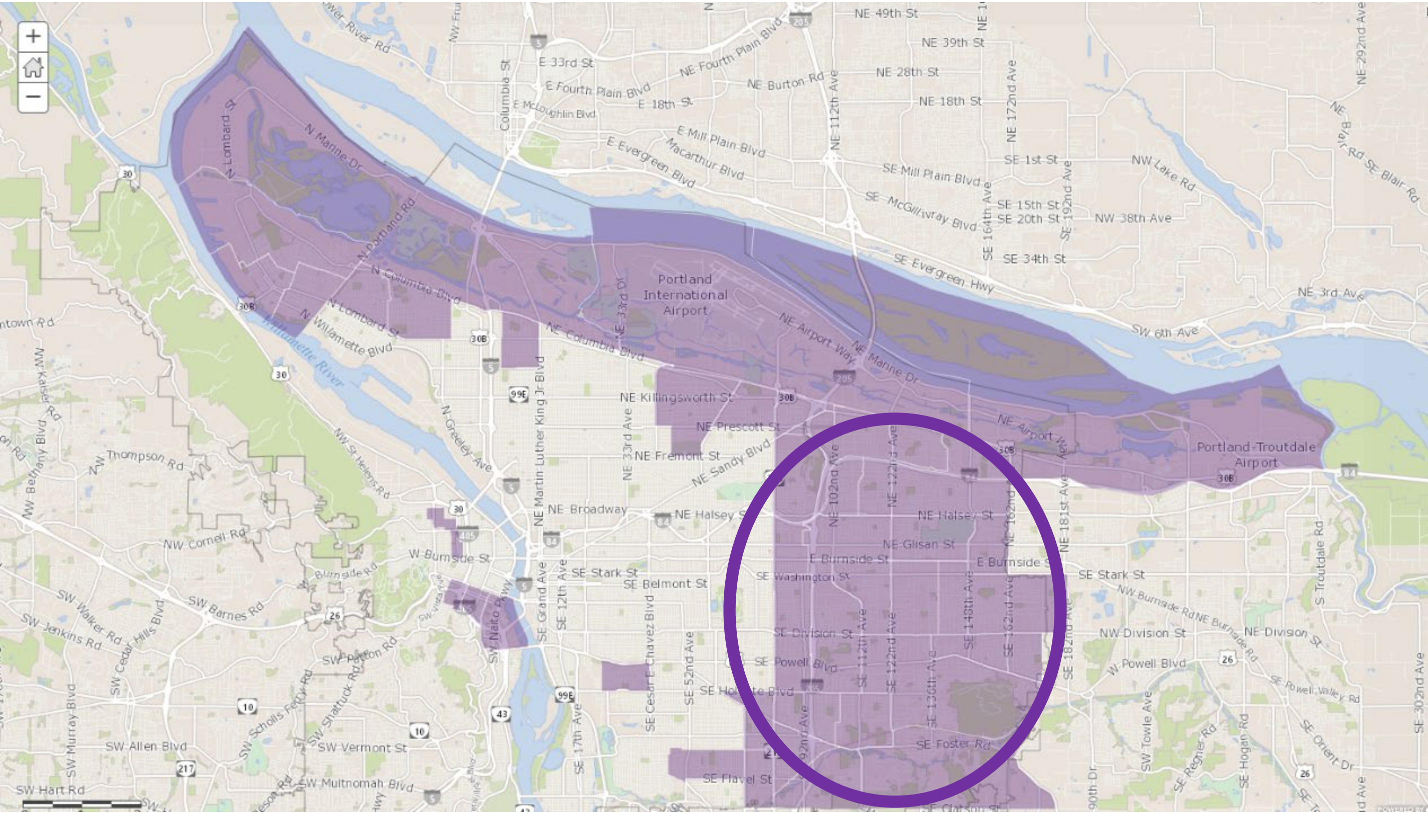
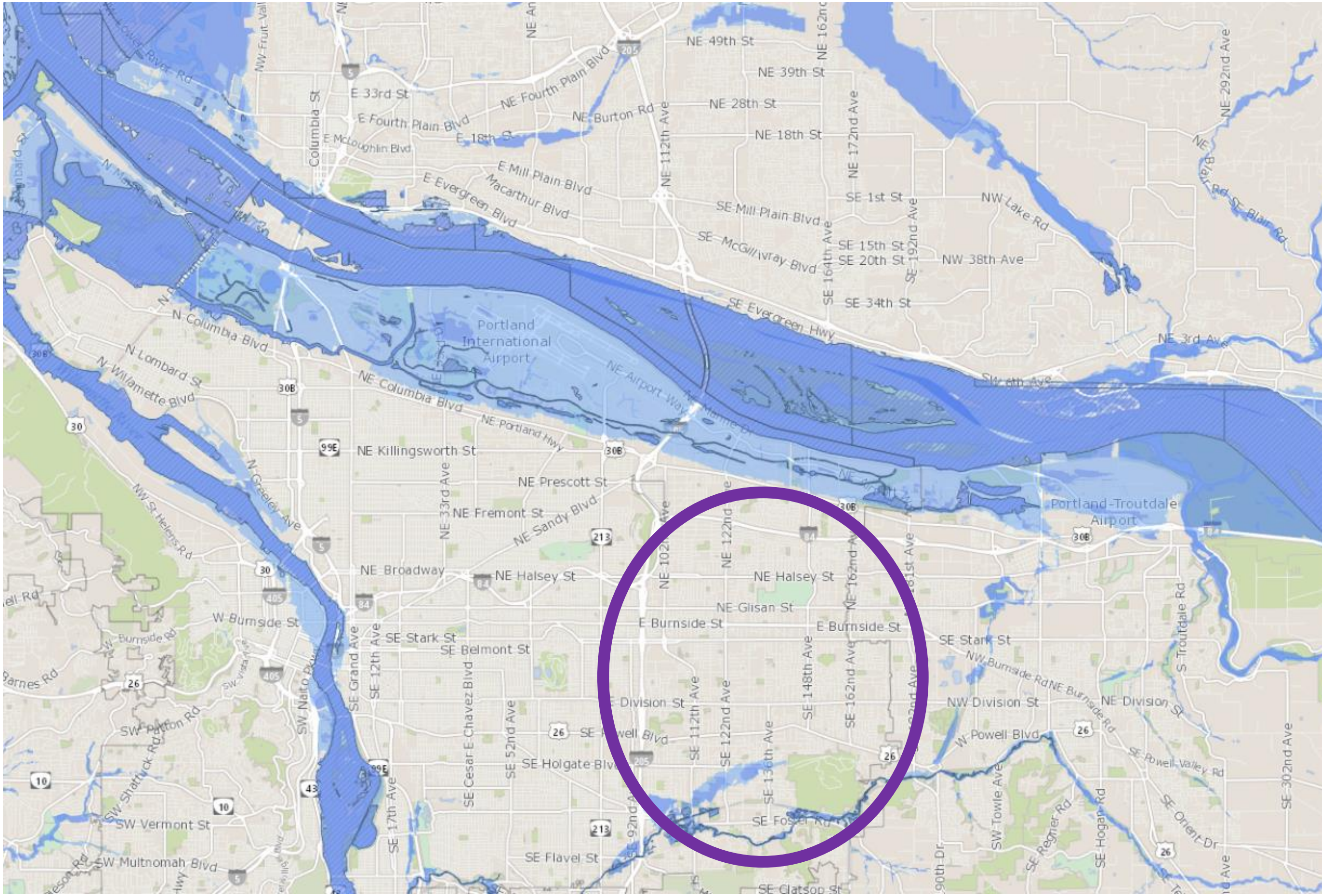

Critical Park's Maintenance Facility
Schools
Fire Station


Portland International Airport
Portland-Troutdale Airport
Willamette River
N Lombard St
N Marine Dr
N Portland Rd
N Columbia Blvd
N Willamette Blvd
NE Columbia Blvd
NE Airport Way
NE Marine Dr
NE Killingsworth St
NE Prescott St
NE Fremont St
NE Sandy Blvd
NE Broadway
NE Halsey St
NE Glisan St
E Burnside St
SE Washington St
SE Stark St
SE Belmont St
SE Division St
SE Powell Blvd
SE Holgate Blvd
SE Foster Rd
SE Flavel St
NE 102nd Ave
NE 122nd Ave
NE 162nd Ave
NE 181st Ave
SE 112th Ave
SE 122nd Ave
SE 136th Ave
SE 148th Ave
SE 162nd Ave
SE 182nd Ave
92nd Ave
NE 33rd Ave
NE Martin Luther King Jr Blvd
SE Grand Ave
SE 12th Ave
SE 52nd Ave
SE Cesar E Chavez Blvd
SE 17th Ave
N Greeley Ave
NW Thompson Rd
NW Cornell Rd
W Burnside St
SW Barnes Rd
SW Naito Pkwy
SW Allen Blvd
SW Vermont St
SW Multnomah Blvd
SW Hart Rd
SW Murray Blvd
SW Scholls Ferry Rd
E Fourth Plain Blvd
NE Fourth Plain Blvd
E 33rd St
E 18th St
E Mill Plain Blvd
E Evergreen Blvd
SE Mill Plain Blvd
SE McGillivray Blvd
SE Evergreen Hwy
NE 49th St
NE 39th St
NE 28th St
NE 18th St
NE Burton Rd
NE 112th Ave
NE 172nd Ave
SE 1st St
SE 15th St
SE 20th St
SE 34th St
NW Lake Rd
NW 38th Ave
NE 3rd Ave
SW 6th Ave
SE Stark St
NW Division St
NE Division St
W Powell Blvd
S Troutdale Rd
SE 302nd Ave
NE 292nd Ave



NE 49th St
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SW Patton Rd
SW Shattuck Rd
SW Vermont St
SW Multnomah Blvd
Barnes Rd
Portland-Troutdale Airport
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SE Regner Rd
SE Hogan Rd
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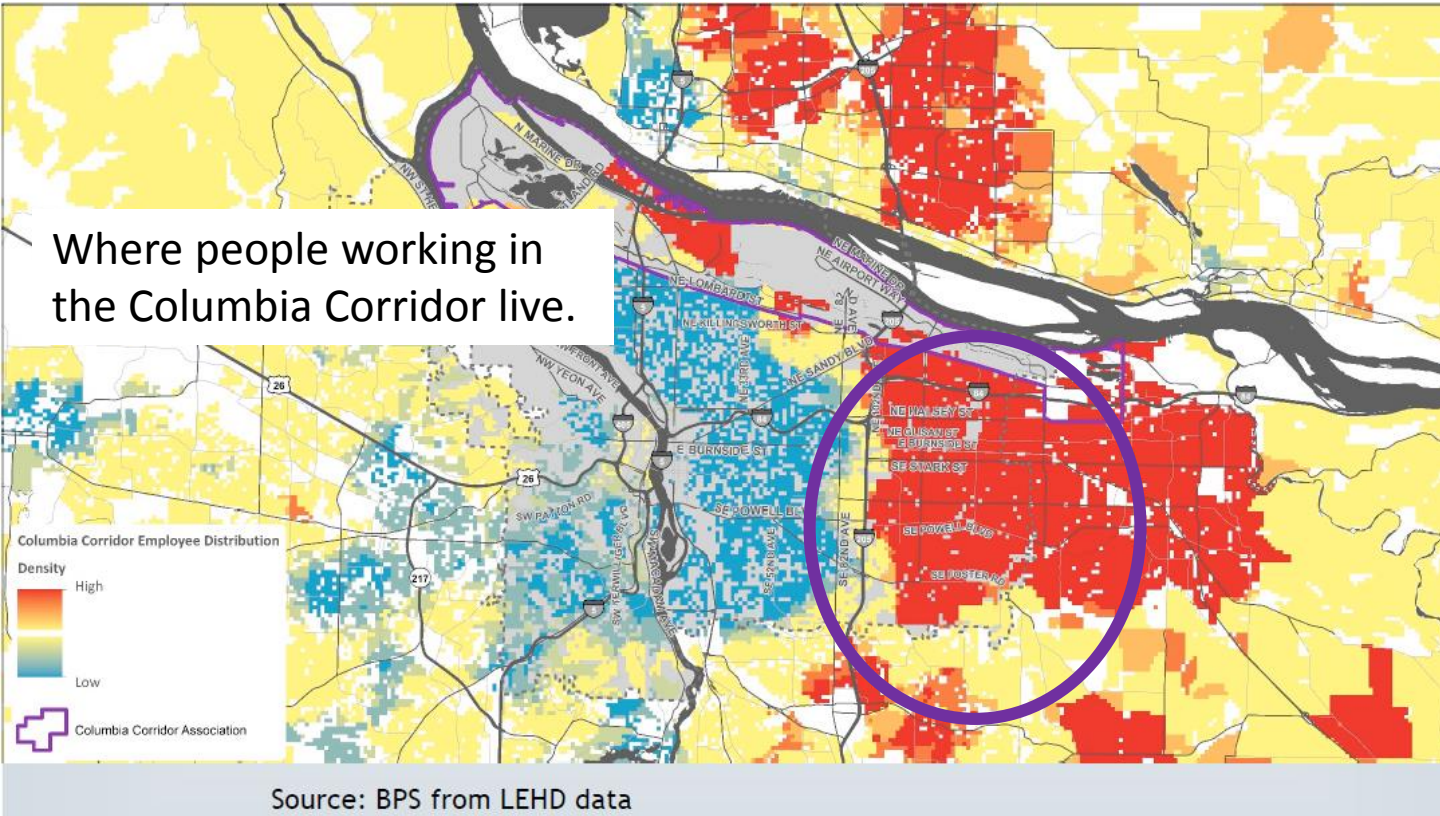
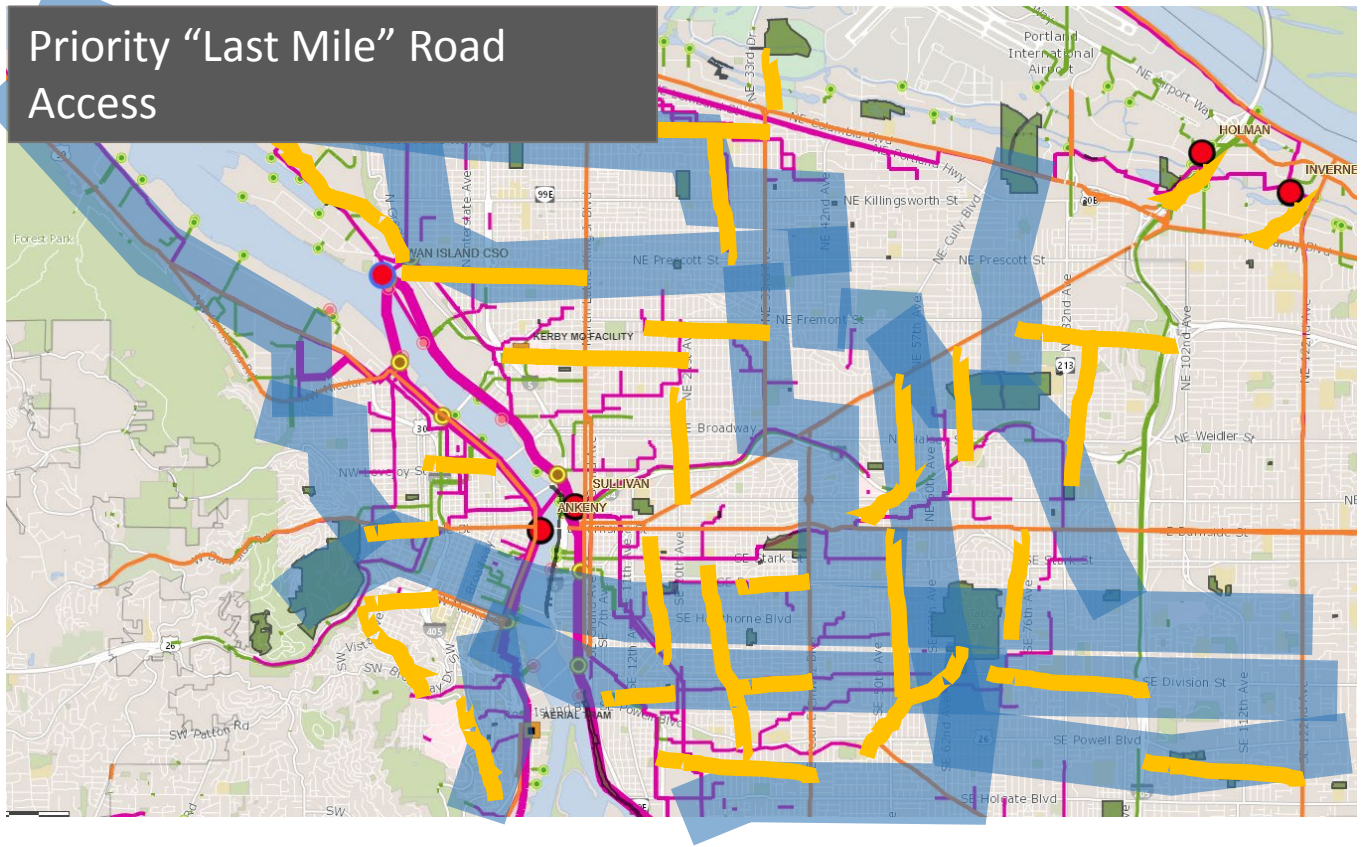
SE 302nd Ave

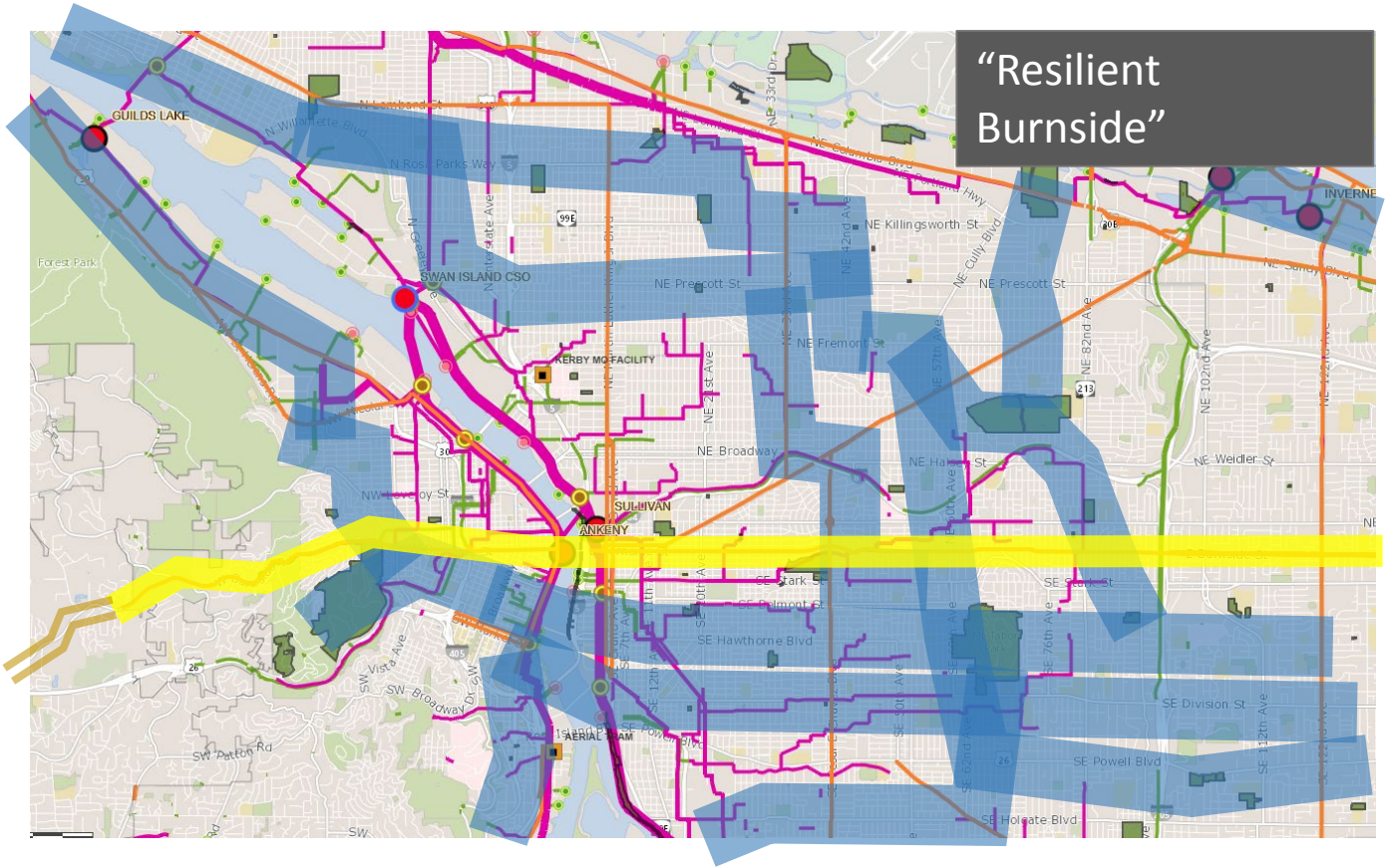


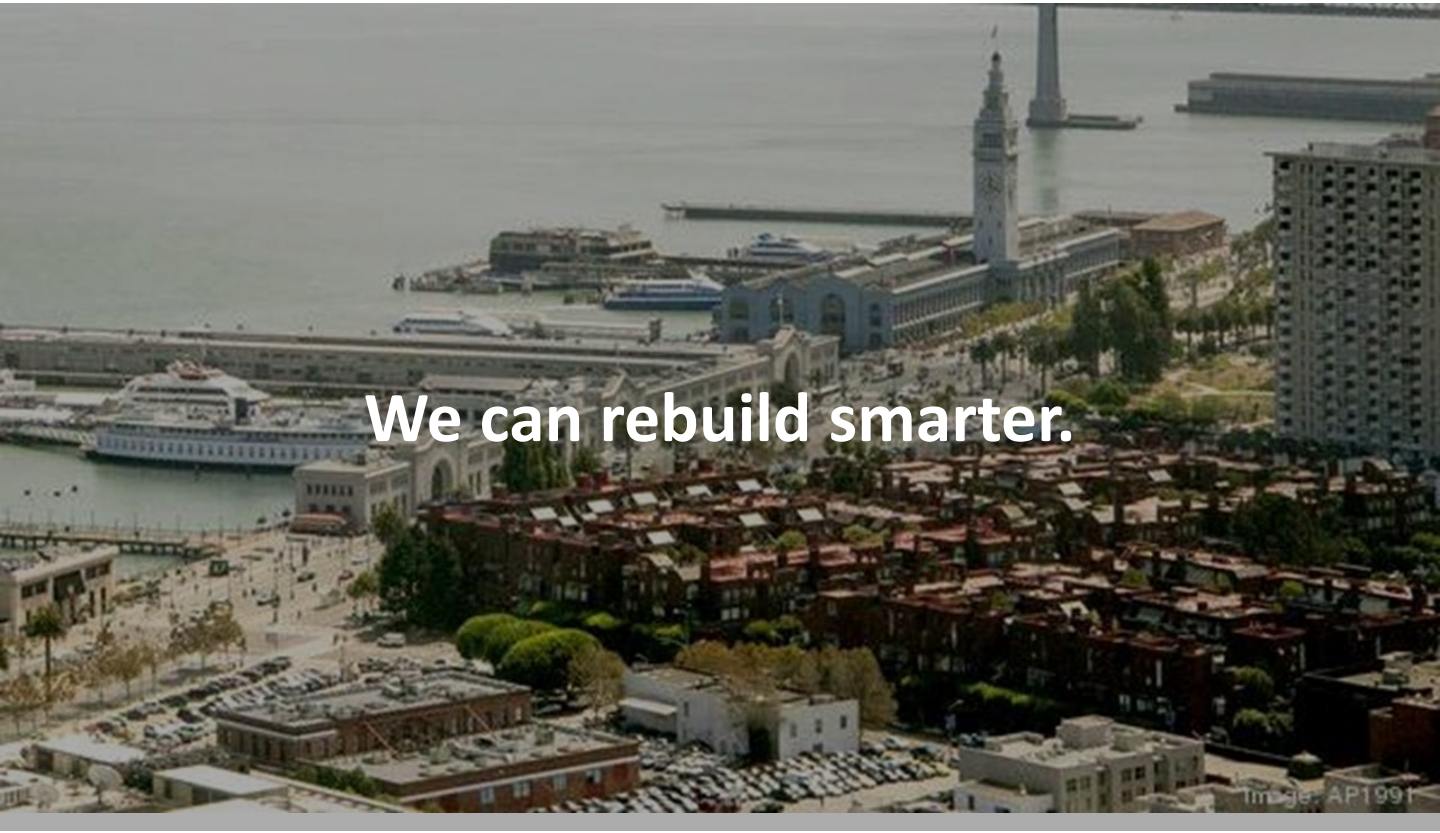
Source: BPS from LEHD data


Recovery planning benefits us now
and in the future.

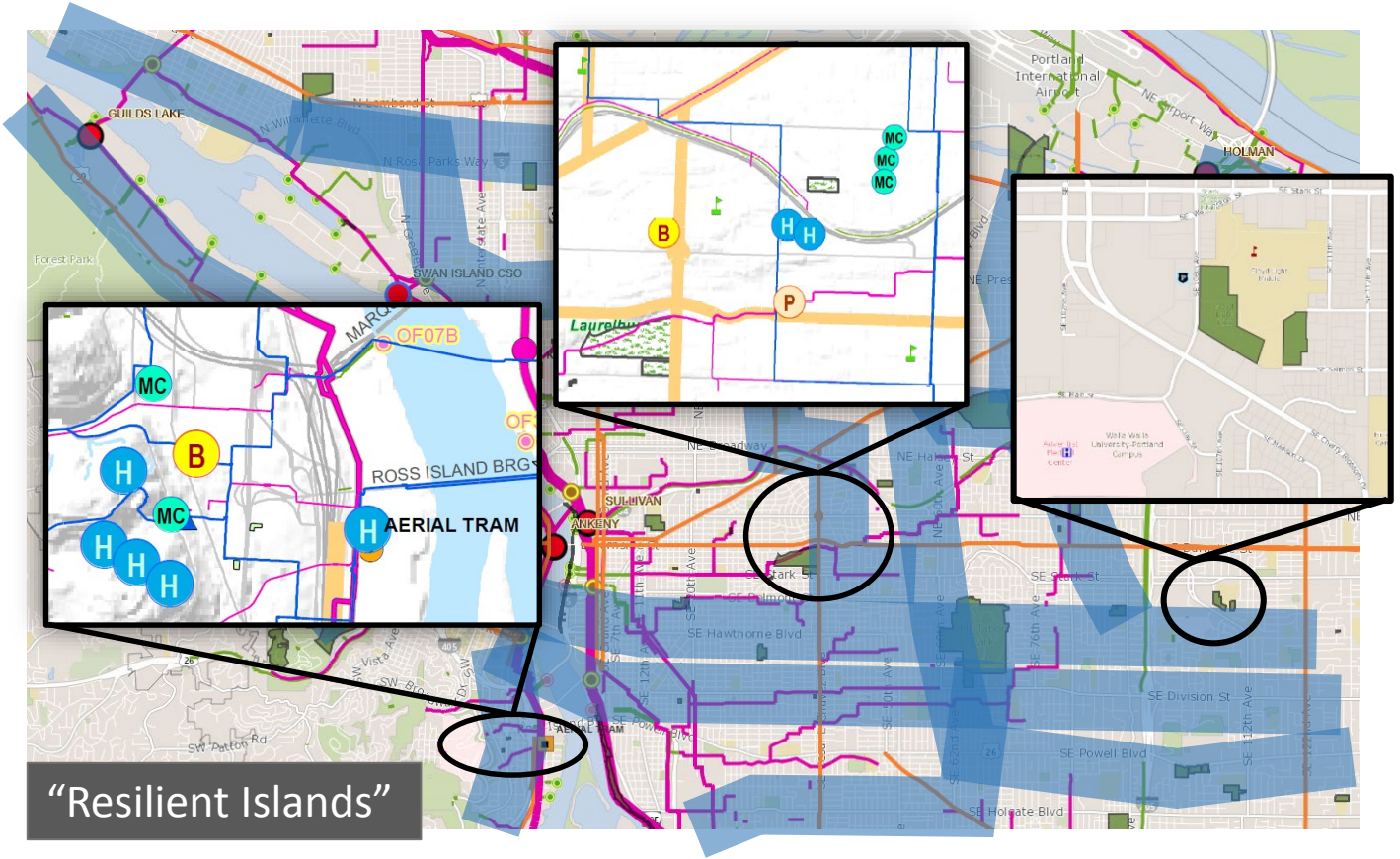
Priority “Last Mile” Road Access



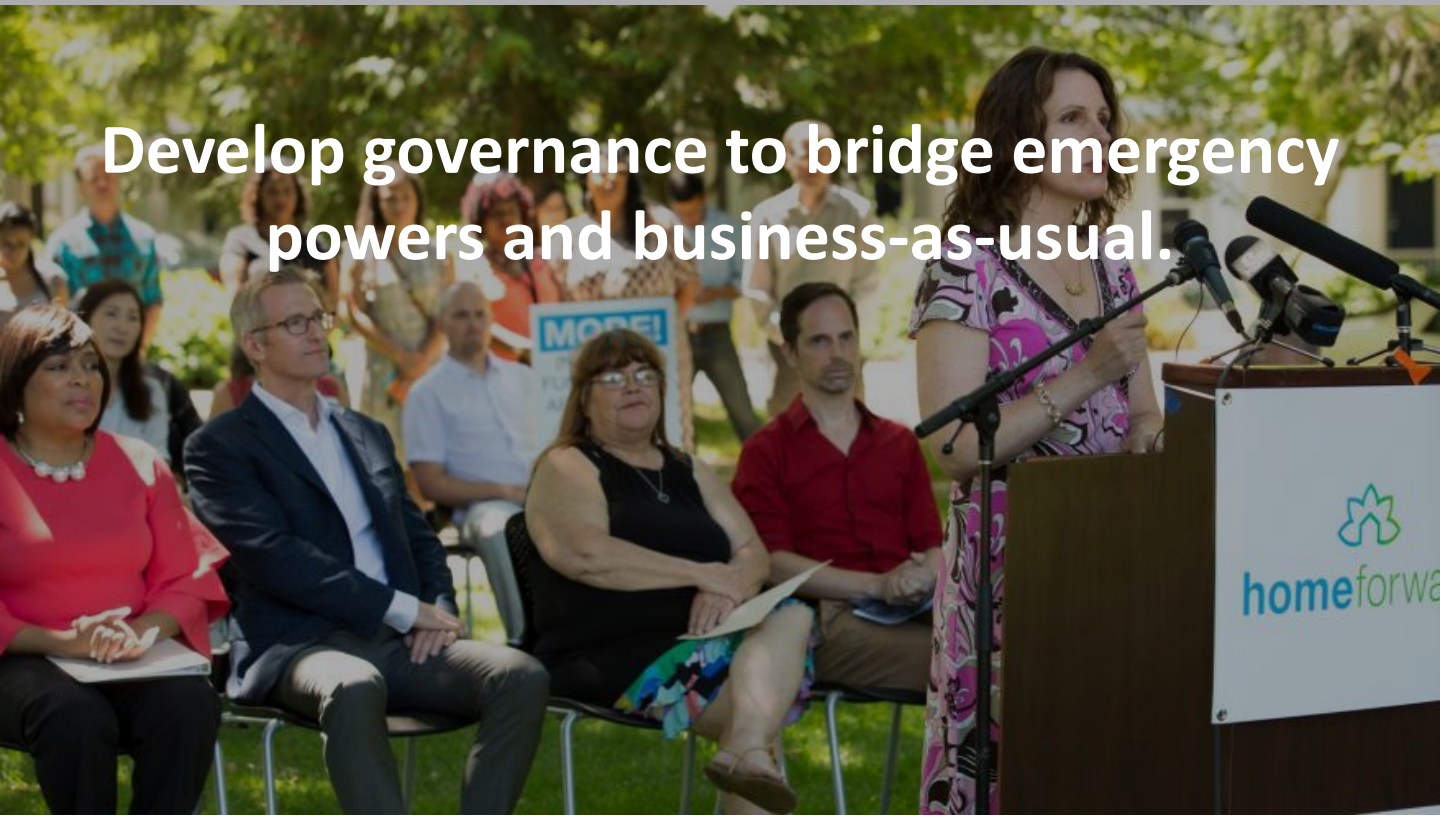

"Resilient Burnside"
GUILDS LAKE
Forest Park
SWAN ISLAND CSO
KERBY MOF FACILITY
SULLIVAN
ANKENY
AERIAL TRAM
INVERNE
NE Killingsworth St
NE Prescott St
NE Fremont St
NE Broadway
NE Halsey St
NE Weidler St
NE 82nd Ave
NE 102nd Ave
SE Stark St
SE Belmont St
SE Hawthorne Blvd
SE Division St
SE Powell Blvd
SE Holgate Blvd
SW Broadway Dr
SW Patton Rd
N Rosa Parks Way
N Willamette Blvd


We can rebuild smarter.
Image: AP1991

Co-Location Recovery Planning



“Resilient Islands”


Develop governance to bridge emergency powers and business-as-usual.
homeforwa

Questions?

Discussion

Questions to consider related to transportation resilience and recovery:

- What is the role of cities and counties?
- What is the role of RPDO, state agencies and Metro?
- What opportunities exist for enhancing coordination and collaboration?

RDPO
Regional Disaster Preparedness Organization

Thank you!

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