Regional Freight Strategy

A strategy for efficient goods movement in, to and from the greater Portland region

December 6, 2018
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The Joint Policy Advisory Committee on Transportation (JPACT) is a 17-member committee that provides a forum for elected officials and representatives of agencies involved in transportation to evaluate transportation needs in the region and to make recommendations to the Metro Council. The established decision-making process assures a well-balanced regional transportation system and involves local elected officials directly in decisions that help the Metro Council develop regional transportation policies, including allocating transportation funds.

Regional Transportation Plan website: oregonmetro.gov/rtp
Regional Transit Strategy web site: oregonmetro.gov/transit

The preparation of this strategy was financed in part by the U.S. Department of Transportation, Federal Highway Administration and Federal Transit Administration. The opinions, findings and conclusions expressed in this strategy are not necessarily those of the U.S. Department of Transportation, Federal Highway Administration and Federal Transit Administration.
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BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF ADOPTING THE 2018 REGIONAL FREIGHT STRATEGY AND REPLACING THE 2010 REGIONAL FREIGHT PLAN

) RESOLUTION NO. 18-4893

) Introduced by Chief Operating Officer Martha Bennett in concurrence with Council President Tom Hughes

WHEREAS, in 2010 the Metro Council adopted the region’s first Regional Freight Plan via Ordinance No. 10-1241B as a component of the Regional Transportation Plan (RTP); and

WHEREAS, the 2010 Regional Freight Plan defined goals, strategies and actions designed to guide the stewardship of the multimodal freight infrastructure and industrial land supply in the greater Portland region; and

WHEREAS, in 2016 Metro created a Regional Freight Work Group consisting of topical experts, Portland Freight Committee members, Transportation Policy Alternatives Committee and Metro Technical Advisory Committee members or their designees, representatives of cities and counties, the Port of Portland and Port of Vancouver, the Federal Highway Administration, and the Oregon Department of Transportation; and

WHEREAS, the Regional Freight Work Group was tasked with analyzing data regarding existing conditions and identifying trends and challenges, reviewing draft freight policy refinements and proposed actions to support implementation, and implementing policy direction from the Metro Council, the Metro Policy Advisory Committee and the Joint Policy Advisory Committee on Transportation regarding updating the 2010 Regional Freight Plan data, policies, projects and strategies; and

WHEREAS, the Regional Freight Work Group met nine times from 2016 through early 2018 and provided input to Metro staff regarding the development of a new Regional Freight Strategy (RFS) to replace the 2010 Regional Freight Plan and to be adopted concurrently with the 2018 Regional Transportation Plan (RTP); and

WHEREAS, the 2018 RFS provides a coordinated vision and strategy for freight transportation in the greater Portland region, and is the freight element of the 2018 RTP; and

WHEREAS, Metro released the initial draft of the 2018 RFS for public review and comment on June 29, 2018; and

WHEREAS, Metro provided a 45-day public comment period on the draft 2018 RFS from June 29 to August 13, 2018, and received comments through September 6, 2018; and

WHEREAS, the Metro Council held a public hearing on August 2, 2018 to accept public testimony and comments regarding the draft RFS; and

WHEREAS, Metro staff invited four Native American Tribes, the Federal Highway Administration, the Federal Transit Administration, the ports of Portland and Vancouver, and other federal, state and local resource, wildlife, land management and regulatory agencies to consult on the public review draft RFS in accordance with 23 CFR 450.316, and convened four separate consultation meetings on August 6, 14 and 21 and September 6, 2018; and
WHEREAS, the Metro Council, the Joint Policy Advisory Committee on Transportation (JPACT), the Metro Policy Advisory Committee (MPAC), the Metro Technical Advisory Committee (MTAC), the Transportation Policy Alternatives Committee (TPAC), the Federal Highway Administration, the Federal Transit Administration, the ports of Portland and Vancouver, local government elected officials and staff, business and community leaders, public agencies, private and nonprofit organizations and the public, assisted in the development of the 2018 RFS and provided comment on the RFS throughout the planning process conducted for the 2018 RTP update; and

WHEREAS, JPACT and MPAC have recommended approval of the 2018 RFS by the Metro Council; and

WHEREAS, the Metro Council held two additional public hearings on the 2018 RFS identified in Exhibit A on November 8 and December 6, 2018; now therefore,

BE IT RESOLVED that the Metro Council hereby adopts the 2018 Regional Freight Strategy attached to this Resolution as Exhibit A, as amended by the “Summary of Comments Received and Recommended Actions” in Exhibit B, as a component of the 2018 Regional Transportation Plan (RTP), replacing the 2010 Regional Freight Plan.

ADOPTED by the Metro Council this 18th day of December, 2018.

Tom Hughes, Council President

Approved as to Form:

Nathan A. S. Sykes
Acting Metro Attorney
Regional Freight Strategy Executive Summary

The 2018 Regional Freight Strategy sets regional freight policy for the Portland metropolitan area, and is a replacement of the Regional Freight Plan from June of 2010. The 2018 Regional Freight Strategy also provides the freight plan for the Portland metropolitan region, defined as the area within the Metropolitan Planning Area (MPA). The MPA is slightly larger than the region’s Urban Growth Boundary.

In 2016 and 2017, the Regional Freight Work Group was one of eight technical work groups identified to provide input and technical expertise to support the 2018 Regional Transportation Plan (RTP) update. In this role, the work groups were convened to advise Metro staff on implementing policy direction from the Metro Council, the Metro Policy Advisory Committee (MPAC) and the Joint Policy Advisory Committee on Transportation (JPACT). The Regional Freight Work Group met nine times from January 2016 through early 2018.

The regional freight work group consisted of topical experts, Portland Freight Committee members, Transportation Policy Alternatives Committee (TPAC) and Metro Transportation Advisory Committee (MTAC) members or their designees, and staff from the City of Portland, larger cities in the region, Clackamas County, Multnomah County, Washington County, Port of Portland, Port of Vancouver, Regional Transportation Council (RTC) in Vancouver Washington, Federal Highway Administration (FHWA), and Oregon Department of Transportation (ODOT).

Regional Freight and Goods Movement and the Greater Portland Economy

The region’s goods movement infrastructure and unique geographic location are competitive advantages that have created transportation sector jobs for more than a century. These jobs, in turn, serve the industrial and local freight needs of the Portland metro region, the state, the Pacific Northwest, the West Coast and the nation.

By 2040, the region’s goods movement system will need to absorb a near doubling of freight volumes, measured in tonnage by all freight modes, with approximately 75 percent of that dependent on trucks to link producers and consumers, or to reach intermodal nodes for import and export.¹

As the region grows, the health of residents and communities will depend on decision-makers who appreciate the interdependence of economic, transportation and land use goals. The logistics and freight transportation sectors perform the vital task of distributing the myriad of goods that Oregonians consider essential to the maintenance of our households, businesses and communities.

Regional Freight Vision and Concept (from Chapter 3)

Informing the regional framework for freight policy is the understanding that the Portland-Vancouver region is a globally competitive international gateway and domestic hub for commerce.

¹ Port of Portland Commodity Flow Forecast, March 2015
The multimodal freight transportation system is a foundation for economic activities and we must strategically maintain, operate and expand it in a timely manner to ensure a vital and healthy economy.

The Regional Freight Network Concept contains policy and strategy provisions to develop and implement a coordinated and integrated freight network that helps the region’s businesses attract new jobs and remain competitive in the global economy.

The transport and distribution of freight occurs via the regional freight network, a combination of interconnected publicly and privately owned networks and terminal facilities. The concept in Figure 7 shows the components of the regional freight system and their relationships.

Rivers, mainline rail, pipeline, air routes and arterial streets and throughways connect the region to international and domestic markets and suppliers beyond local boundaries. Inside the region, throughways and arterial streets distribute freight moved by truck to air, marine and pipeline terminal facilities, rail yards, industrial areas and commercial centers. Rail branch lines and heavy vehicle corridors connect industrial areas, marine terminals and pipeline terminals to rail yards and truck terminals. Pipelines transport petroleum products to and from terminal facilities.

**Figure 7. Regional freight concept**

**Regional Freight Network Map**

The Regional Freight Network map has been updated for the latest Regional Freight Strategy and is significantly different than the one found in the 2014 Regional Transportation Plan and the 2010 Regional Freight Plan. To show the continuity of the freight system in both Oregon and Washington State, the map now shows the freight routes in Clark County, north of the Columbia River.

The other major update to the Regional Freight Network map is the addition of a new freight roadway designation for Regional Intermodal Connectors. The Regional Intermodal Connectors represent National Highway System (NHS) intermodal connectors and other Tier 1 intermodal connectors that were designated by ODOT as part of the Oregon Freight Intermodal Connector System (OFICS) Study completed in 2017. National Highway System (NHS) intermodal connectors are roads that provide the “last-mile” connections between major rail, port, airport, and intermodal freight facilities and the rest of the National Highway System.
Additional information on the Regional Freight Network map and intermodal connectors can be found in Chapter 3 of the Regional Freight Strategy. The Regional Freight Network map and inset maps are on the last two pages of this executive summary, and they apply the regional freight concept on the ground to identify the transportation networks and freight facilities that serve the region and state’s freight mobility needs.

**Regional Freight Policies**

The following Regional Freight Policies, including a new policy (Policy 7) directed by the Metro Council that addresses the issue of freight safety regarding the interaction of different freight modes (trucks, railroad trains, etc.) with passenger cars, bicyclist and pedestrians, guide the Regional Freight Strategy:

- **Policy 1:** Plan and manage our multimodal freight transportation infrastructure using a systems approach, coordinating regional and local decisions to maintain seamless freight movement and access to industrial areas, and intermodal facilities.
- **Policy 2:** Manage first-rate multi-modal freight networks to reduce delay, increase reliability, improve safety and provide shipping choices.
- **Policy 3:** Better integrate freight issues in regional and local planning and communication to inform the public and decision-makers on the importance of freight and goods movement issues.
- **Policy 4:** Pursue a sustainable multimodal freight transportation system that supports the health of the economy, communities and the environment through clean, green and smart technologies and practices.
- **Policy 5:** Protect critical freight corridors and access to industrial lands by integrating freight mobility and access needs into land use and transportation plans and street design.
- **Policy 6:** Invest in our multi-modal freight transportation system, including road, air, marine and rail facilities, to ensure that the region and its businesses stay economically competitive.
- **Policy 7:** Eliminate fatalities and serious injuries caused by freight vehicle crashes with passenger vehicles, bicycles, and pedestrians, by improving roadway and freight operational safety.

These freight network policies were used to develop the freight actions that are outlined in Chapter 8 of the Regional Freight Strategy.

**Linking Freight Policy and Freight Actions (from Chapter 8)**

Chapter 8 of the Regional Freight Strategy constitutes the regional freight action plan. Many of the freight actions are foundational activities like planning, coordinating, research and policy making and take place on both an ongoing and cyclic basis. Freight action items are a selection of important, achievable near-term actions, and a few long term actions that will require additional scoping and
determining the availability of staff time. The near-term action items should be achievable within the next 5 years and the long-term actions would take longer than 5 years.

Each of the freight action items are associated with one of the seven regional freight and goods movement policies. Detailed descriptions for each of the actions are included in Chapter 8.

**Action items for Policy 1**

Near-term actions:

1.1: Better define, preserve and enhance freight function in mobility corridors
1.2: Maintain private sector cooperation with Metro’s planning and technical coordination, and with goods movement policy
1.3: Continue baseline freight and goods movement data collection and reporting activities
1.4: Coordinate research, modeling and planning with Oregon Department of Transportation (ODOT)

Long-term actions:

1.5: Develop and conduct a freight and goods movement research program

**Action items for Policy 2**

Near-term actions:

2.1: Assess the need to develop and fund better incident management and traveler information
2.2: Continue support for use and expansion of ITS system management tools
2.3: Support workforce access to the region’s industrial jobs through Metro Regional Travel Options (RTO)/Transportation Demand Management (TDM) programs

Long-term actions:

2.4: Identify key mobility corridors for testing and development of Connected Vehicle (CV) infrastructure and other intelligent transportation systems (ITS) strategies

**Action items for Policy 3**

Near-term actions:

3.1: Establish a freight stakeholder outreach program
3.2: Provide support for topical fact sheets, and other published media that expands awareness of freight issues
3.3: Coordinate with Economic Value Atlas work which includes the economic development community
Action items for Policy 4

Near-term actions:

4.1: Provide useful “green freight” links from Metro’s freight program webpage
4.2: Pursue greenhouse gas and other pollutant reduction policies and strategies for freight that transitions the region to lower or zero emission freight vehicles and equipment
4.3: Incorporate updated DEQ diesel emissions inventory data into regional and local freight plans
4.4: Support and partner with local jurisdictions to develop policies to phase out older and dirtier diesel truck engines and diesel equipment used in the transport of freight

Action items for Policy 5

Near-term actions:

5.1: Continue to implement land use strategies to protect the existing supply of industrial land
5.2: Provide a freight perspective to the revision of Metro’s ‘Creating Livable Streets’ design guidelines

Long-term actions:

5.3: Examine the need for additional industrial land and the availability and readiness of industrial lands

Action items for Policy 6

Near-term actions:

6.1: Work toward implementation of the RTP freight priority projects
6.2: Strengthen the tie between project prioritization and the framework for freight performance
6.3: When appropriate, focus regional funds on large capital projects
6.4: Make strategic incremental improvements when large capital projects are unfunded
6.5: Ensure that unfunded freight projects are on an aspirational or strategic RTP project list
6.6: Develop a regional freight rail strategy

Long-term actions:

6.7 Develop policy and evaluation tools to guide public investment in private freight infrastructure, focused on rail projects
**Action items for Policy 7**

Near-term actions:

7.1: Promote and advocate with the cities and counties for the implementation of truck side guards on large freight trucks providing public services (i.e. sanitation and recycling), consistent with USDOT specifications.

7.2: Develop design guidance for identifying and prioritizing improvements to regional intermodal connectors that should have bike and pedestrian facilities that are separated from the roadway, and other design treatments to enhance the safety of non-motorized modes.

**Guide to other important freight information and topics within the Regional Freight Strategy**

There are other important freight information and topics within the overall Regional Freight Strategy that have not been included in this Executive Summary. The following provides direction to finding more detail about those topics in the Regional Freight Strategy:

- **Chapter 4** provides an overview of the regional freight needs by freight mode, and the priority issues for freight and goods movement.

- **Chapter 5** outlines the importance of manufacturing, warehousing and distribution to providing jobs and supporting the region's economy.

- **Chapter 6** covers innovation and technology as it relates to freight transportation. The chapter describes vehicle-to-infrastructure (V2I) communications development to understand how different applications of connected vehicle (CV) technology will improve commodity movement within the next five years.

- **Chapter 7** provides information on freight funding sources and new state and federal funding resources for freight projects.

- **Chapter 9 and Appendix A** provides the list of all 2040 RTP Freight Projects that were included as part of round 2 of the RTP call for projects. Chapter 9 also provides a description of two future freight studies that will be completed as part of the implementation of the Regional Freight Strategy.

- **Chapter 10** provides the context for how the region will measure progress toward achieving national freight performance goals and the goals and policies for freight and goods movement that are outlined in the 2018 Regional Transportation Plan.
CHAPTER 1

INTRODUCTION

FREIGHT’S ROLE IN THE REGION’S ECONOMY

The 2018 Regional Freight Strategy sets regional freight policy for the Portland metropolitan area and is a replacement of the Regional Freight Plan from June of 2010. This introduction provides context for the Regional Freight Strategy, including the role of regional government in freight planning, and existing federal, state, and regional policies related to goods movement.

1.1 Metro’s role

As the region’s metropolitan planning organization (MPO), Metro has a variety of roles and requirements in freight planning, including:

- Developing the Regional Transportation Plan (RTP) and the Metropolitan Transportation Improvement Plan (MTIP), including projects consistent with regional plans and policies.
- Allocating federal transportation funding through a project selection process informed by regional policies.
- Reviewing local comprehensive and transportation plans for consistency with the RTP.
- Reporting on freight targets and freight system performance measures.
- Convening jurisdictions and agencies to achieve better coordination.
- Collecting, maintaining and disseminating data.
- Encouraging best practices in freight strategies and roadway design with funding and programmatic support.
- Supporting local and state efforts to implement and update plans, policies and projects.

The 2018 Regional Freight Strategy provides the freight plan for the Portland metro region, defined as the area within the Metropolitan Planning Area (MPA). The MPA is slightly larger than the region’s Urban Growth Boundary. Since freight and goods movement do not stop at the MPA boundary, Metro staff make sure to coordinate with the Oregon Department of Transportation (ODOT), the Port of Vancouver and Regional Transportation Council in Washington State to receive information on freight-related networks and issues outside the MPA.
1.2 History of the Regional Freight Plan

The 2010 Regional Freight Plan defined goals, strategies and actions designed to guide the stewardship of our critical multimodal regional freight infrastructure and industrial land supply, to support a sustainable, balanced and prosperous tomorrow.

The 2010 Regional Freight Plan was an element of the RTP update and was guided by the Metro Council appointed 33 member private-public sector Regional Freight and Goods Movement (RFGM) Task Force and a technical advisory committee. The plan is built on a foundation of technical work, including research on the region’s freight transportation systems and facilities, needs and issues. A more detailed history of the RFGM Task Force (including a membership roster), and the Regional Freight Advisory Committee that served as the technical advisory committee, is included in Appendix B of this Regional Freight Strategy.

The 2010 Regional Freight Plan provided implementation strategies for addressing environmental and community impacts, system management, economic development and financing that were reviewed and recommended.

In 2016 and 2017, the Regional Freight Work Group was one of eight technical work groups identified to provide input and technical expertise to support the 2018 Regional Transportation Plan (RTP) update. In this role, the work groups were convened to advise Metro staff on implementing policy direction from the Metro Council, the Metro Policy Advisory Committee (MPAC) and the Joint Policy Advisory Committee on Transportation (JPACT). The Regional Freight Work Group met nine times from January 2016 through early 2018.

The primary charge of the Regional Freight Work Group was to:

- Review status of 2010 Regional Freight Plan recommendations and help update freight data.
- Review documents on key trends and challenges with updated existing conditions data.
- Review a shared freight investment strategy.
- Review draft freight policy refinements and actions to support implementation.

The regional freight work group consists of topical experts, Portland Freight Committee members, Transportation Policy Alternatives Committee (TPAC) and Metro Technical Advisory Committee (MTAC) members or their designees, and staff from the City of Portland, larger cities in the region, Clackamas County, Multnomah County, Washington County, Port of Portland, Port of Vancouver, Regional Transportation Council (RTC), Federal Highway Administration (FHWA), and the Oregon Department of Transportation (ODOT).
### Table 1: Regional Freight Work Group Members:

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<tr>
<th>Name</th>
<th>Affiliation</th>
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<td>City of Vancouver</td>
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<td>Erin Wardell</td>
<td>Washington County</td>
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<tr>
<td>Pia Welch</td>
<td>FedEx Express</td>
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<tr>
<td>Steve Williams</td>
<td>Clackamas County</td>
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### Table 2: Regional Freight Work Group Alternates:

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Steve Kelley</td>
<td>Washington County</td>
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<tr>
<td>Gregg Snyder</td>
<td>City of Hillsboro</td>
</tr>
<tr>
<td>Joanna Valencia</td>
<td>Multnomah County</td>
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</table>
1.3 Relationship to other plans

The Regional Freight Strategy for the Portland metro region is an element of the RTP. While the strategy targets needs and issues specific to the freight transportation system, key policies and actions are incorporated into the comprehensive RTP.

Implementation strategies for addressing environmental and community impacts, system management, economic development and financing have been reviewed and recommended as part of the RTP. The freight strategy will contribute to recommendations to better incorporate truck movement into Metro’s Designing Livable Streets and Trails Guide.

Regional Transportation Plan

Metro periodically reviews and updates the Regional Transportation Plan (RTP) to keep it current with transportation challenges facing the region and to incorporate new information, technologies and strategies. The updated plan provides a blueprint for building a sustainable transportation future that allows the region to compete in the global economy and preserve the unique qualities and natural beauty that define our region. An overarching aim of the RTP is to move the region closer to the vision of the region’s long-range strategy for managing growth the 2040 Growth Concept. Fundamentally, the RTP defines a framework for making choices about the future of the region - choices about where to allocate limited transportation resources and choices about the future residents wish to see for our region and, by extension, the State of Oregon.

1.4 Process and public engagement

2018 Regional Transportation Plan:

Phase 1: Getting started

Beginning in summer 2015, the first phase consisted of engaging local, regional, state, business and community partners to prioritize the regional challenges to be addressed in the update and the process for how the region should work together to address them. This engagement included:

- interviews with 31 stakeholders
- discussion groups in partnership with Metro’s diversity, equity and inclusion team with communities of color and youth on priorities and issues related to racial equity
- a partnership with PSU’s Center for Public Service and 1000 Friends of Oregon to explore components of inclusive public engagement to develop an approach to better reach underrepresented communities
- a public involvement retrospective that summarized previous feedback from communities of color on transportation planning and project development
- an online survey with more than 1,800 participants to help identify the top transportation issues facing the greater Portland region.
This phase concluded in December 2015 with JPACT and Council approval of the work plan and public participation plan for the update. In addition to implementing the 2014 Climate Smart Strategy, the adopted work plan identified seven policy topics for the Regional Transportation Plan update to focus on – safety, equity, freight, transit, finance, performance, and design.

**Phase 2: Framing trends and challenges** The second phase began in January 2016 and concluded in April 2016. In this phase, Metro engaged the public, jurisdictional partners and business and community leaders to document key trends and challenges facing the region as well as priority outcomes for investment in the region’s transportation system. This included:

- an online survey with more than 5,800 participants working through the questions
- a Regional Snapshot on transportation published in April 2016.

Also in April 2016, the Metro Council convened members of MPAC, JPACT, state legislators, community and business leaders and other interests from across the region to discuss the key trends and challenges facing the region during the first of four regional leadership forums.

Metro staff also worked with ODOT’s economist and jurisdictional partners, individually and through a technical work group, to forecast a budget of federal, state and local funds the greater Portland region can reasonably expect by 2040 under current funding trends.

**Phase 3: Looking forward** From May 2016 to May 2017 technical work and public engagement activities continued to focus on finalizing a shared vision statement for the plan, developing draft strategies for safety, transit and freight, and updating the evaluation framework and measures for evaluating plan performance. The engagement for this phase included:

- a round of follow up discussion groups in partnership with Metro’s diversity, equity and inclusion team with communities of color and youth to review actions and priorities for the agency’s racial equity strategy
- focus and discussion groups on transportation priorities for communities of color and strategies to improve engagement with underrepresented groups
- an online survey focusing on priorities for communities of color
- an online survey with more than 2,600 participants on investment priorities and funding
- another round of discussion groups with communities of color on hiring practices and priorities related to the Planning and Development department-specific equity plan.

Metro Council also hosted their second and third regional leadership forums. In regional leadership forums 1 and 2, there was consensus that a bold vision and more funding are
needed to build a 21st century transportation system. In forum 3, leaders discussed a shared vision for the future transportation system and potential near-term priorities for addressing regional transportation challenges in ways that supported the vision. Participants also identified actions to build a path to future funding.

Staff also compiled background information and online resource guide maps to support jurisdictional partners as they updated their investment priorities for further evaluation and public review during Phase 4. In addition, staff launched the RTP Project Hub – an online visual database – for jurisdictional partners to use to update project information and collaborate with other jurisdictions. Phase 3 concluded with Metro Council directing staff to release a call for projects to update the region's transportation near and long-term investment priorities to support regional goals for safety, congestion relief, affordability, community livability, the economy, social equity and the environment.

**Phase 4: Building a shared strategy** The fourth phase began in June 2017 with the release of a second Regional Snapshot on transportation and Call for Projects for jurisdictional partners to update the plan's regional transportation project priorities. Agencies were asked to identify projects that address regional needs and challenges, reflect public priorities and maximize progress toward the region’s agreed upon vision and goals for the future transportation system.

Local jurisdictions and county coordinating committees worked within a constrained budget and capital funding targets to determine the project priorities to put forward for inclusion in the plan in collaboration with the Oregon Department of Transportation (ODOT), Metro, South Metro Area Regional Transit (SMART) and TriMet. All project submissions were required to come from adopted plans or studies that provided opportunities for public input.

In summer 2017, Metro analyzed three funding scenarios: 10-year constrained project priorities, 2040 constrained project priorities and 2040 strategic project priorities. The analysis tested new and updated outcomes-based system performance measures to evaluate performance of the transportation system as a whole for each scenario to help inform finalizing the plan’s project priorities in Phase 5. Metro staff also prepared an interactive map of proposed projects and lists that were made available on the project website for the public and partners to use to learn more about the projects under consideration. Safety, transit, freight and emerging technology strategies continued to be developed on parallel tracks. Jurisdictions also piloted project-level evaluation criteria on 50 projects; the pilot project evaluation will be advanced during the next RTP update.

The results of the analysis were released in November 2017. Engagement on the call for projects included:

- a community leaders forum for feedback on the results
- Metro Councilor briefings to business and neighborhood groups
- an online survey with more than 2,900 participants.
The analysis was also summarized in a larger discussion guide for decision makers that also relayed key issues and the results of the Call for Projects. A fourth and final Regional Leadership Forum was held March 2018 to discuss findings and recommendations from the technical analysis and public engagement to inform finalizing the plan during Phase 5.

**Phase 5: Adopting a plan of action** The fifth and final phase of the process began in April 2018 and focused on finalizing and adopting the region’s investment priorities and strategies recommended through 2040. The 2018 Regional Transportation Plan will be available for public review in June 2018, with a formal comment period from June 29 through August 13. For this comment period, engagement activities include:

- an online survey with a high level summary the plan
- an interactive map of projects, project lists and a briefing book that provides a more in-depth summary;
- draft documents, including the 2018 Regional Transportation Plan and safety, transit, freight and emerging technology strategies, available for review and comment.

The Metro Council held a hearing on August 2, 2018. All comments received during the comment period were summarized in a public comment report. Recommended changes to the draft materials responded to all substantive comments received during the comment period and were summarized in a public comment log that was considered by MPAC, JPACT and the Metro Council during the adoption process.

JPACT and MPAC made recommendations to the Metro Council in October 2018. Metro Council scheduled legislative hearings on November 8 and December 6. Metro Council considered adoption of the final plan, project priorities and strategies for safety, transit, freight and emerging technology on December 6, 2018.

**Figure 1: Summary of the Regional Transportation Plan development process**

![](Figure1.png)
1.5 Document organization

This section provides a guide for the context and organization of the rest of the 2018 Regional Freight Strategy.

Chapter 2 provides the context for how the Portland metro region became and continues to be a hub for trade and commerce for the entire state of Oregon and beyond, and why that has been an important factor in the economic health of the region. The chapter shows data for the Portland-Vancouver area that confirms the importance of imports and exports to the regional job market, and defines the region as a global gateway for freight and goods movement. The chapter also shows the importance that increasing goods movement could have on the growth of industrial middle income jobs.

Chapter 3 sets the framework for the rest of the Regional Freight Strategy by defining the Regional Freight Concept, the Regional Freight Network map, and the development of the seven Regional Freight Network Policies.

Chapter 4 provides an overview of the regional freight needs by freight mode and the priority issues for freight and goods movement. The chapter provides summaries of the key freight studies that have been completed since 2010 that identified and addressed important freight issues in the region.

Chapter 5 outlines the importance of manufacturing, warehousing and distribution to providing jobs and supporting the region’s economy. Manufacturers and shippers throughout Oregon and Southwest Washington depend on regional warehousing, distribution and multimodal goods movement infrastructure to move materials and products to both domestic and international destinations. The chapter also defines the importance of regional goods movement that travel by the six different freight modes (truck, rail, air cargo, marine ship, pipeline, and river barge).

Chapter 6 covers innovation and technology as it relates to freight transportation. The chapter describes vehicle-to-infrastructure (V2I) communications development to understand how different applications of connected vehicle (CV) technology will improve commodity movement within the next five years. The chapter also describes the tools being used to improve efficiency and reduce idling of truck diesel engines; and the elements of Oregon’s Clean Diesel Initiative and Oregon’s Senate Bill 1008 that provide the benefits of cleaner air.

Chapter 7 provides information on freight funding sources and new state and federal funding resources for freight projects that have become available as part of Oregon’s HB 2017 and the 2015 Federal Transportation Bill (FAST Act).

Chapter 8 provides freight strategies and actions for each of the seven regional freight network policies. Achievable near-term actions (within 5 years) and long-term actions are included and recommended for implementation to support the regional freight and goods movement policies.
Chapter 9 provides the list of all 2040 RTP Freight Projects that were included as part of round 2 of the RTP call for projects. Freight projects are defined as RTP projects within an investment category (Freight and Throughways) and those projects that meet certain criteria for benefiting freight. The chapter defines available freight data sets and analysis tools, including the Commodity Flow Forecast, the Economic Value Atlas, and the new Regional Freight Model. The chapter also provides a description of two future freight studies that will be completed as part of the implementation of the Regional Freight Strategy.

Chapter 10 provides the context for how the region will measure progress toward achieving national freight performance goals and the goals and policies for freight and goods movement that are outlined in the 2018 Regional Transportation Plan.
CHAPTER 2
TRENDS FOR REGIONAL FREIGHT AND GOODS MOVEMENT AND THE GREATER PORTLAND ECONOMY

2.1 Trade, transportation and economic health

The Columbia River serves as a critical international marine gateway to the region’s system of multimodal freight networks.

Portland and Vancouver were founded and grew on the basis of vibrant and profitable statewide, regional and international trade. Access to the Pacific Ocean via the Columbia River from the inland empire to the east created the region’s original economic engine. The Willamette River delivered the wealth of the various river valleys south and west of the Portland metro region in much the same way. It was through this trade that the Portland metro region established itself as a trade hub and prospered.

The Cost of Congestion to the Economy of the Portland Region¹ (2005) reported that the region has a higher than average dependency on traded sector industries, particularly computer and electronic products, wholesale distribution services, metals, forestry, wood and paper products, and publishing. These business sectors serve broader regional, national and international markets and bring outside dollars into the region’s economy. Traded sector industries, such as semiconductor manufacturing or consulting services, are the primary enabler of Portland metropolitan

What is the “traded sector”?
As defined in ORS 285A.010, (8), “traded sector” means industries in which member firms sell their goods or services into markets for which national or international competition exists. As a result of their exchange earnings, these industries increase spending power within their regional or state economies.

economic growth. The Portland region’s traded sector industries are anchored by six core clusters. These industries are important drivers of regional economic activity today and well-positioned to spark future growth. These industries depend on a well-integrated and well-functioning international and domestic transportation system to stay competitive in a global economy. The six core clusters are defined below:

**Clean Technology and Green Cities** – Manufacturing, energy production, design, and waste disposal industries related to sustainability and resilience.

**Computers and Electronics** – Establishments that manufacture computers, computer peripherals, communications equipment and similar electronics products.

**Health Sciences and Technology** – Advanced medical device manufactures, plus related research and development establishments; does not include local hospitals.

**Metals and Machinery** – Broad array of goods-producing establishments working with heavy metals, ranging from foundries to pump makers to ship builders.

**Software and Media** – Service establishments writing software, planning and managing computer systems, hosting data, and producing and distributing video and sound recordings.

**Sporting Equipment, Apparel, and Design** – A unique collection of global apparel companies, personal hardware manufactures, and various design establishments.

As an international gateway and domestic freight hub, the region is particularly influenced by the dynamic trends affecting distribution and logistics. The 2007 commodity flow survey projected an overall doubling of freight tonnage moved in the region by 2035. The region’s forecasted population and job growth – an additional 670,400 residents and 420,200 jobs by 2040 – along with the associated boost in the consumption of goods and services are significant drivers of projected increases in local freight volume. Much of the projected doubling of freight tonnage passing through the Portland metropolitan region doesn’t terminate there but instead moves well beyond the region’s boundaries to the rest of the country.

Today the Portland-Vancouver area boasts an underlying foundation for a strong and diverse regional economy that will continue to support an enviable quality of life. The local economy is still very dependent upon an efficient, reliable and safe freight transportation system that recognizes the region’s role as an international gateway and key domestic freight hub.

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2 Portland Economic Value Atlas Market Scan (The Brookings Institute) August 2017

3 Metro Data Resource Center for 2040 Regional Transportation Plan. Population and employment forecasts include Multnomah, Clackamas, Washington counties in Oregon, and Clark County in southwest Washington. The percentage increases from 2015 to 2040 are 30.2% [population] and 39.2% [employment].
2.2 Freight trends

The global economy is in the midst of a profound change. Twenty-first century innovations in trade policy, communications and transportation have altered the sourcing, production and marketing of products on a global scale. Some of the most important trends are identified below:

- Due to open trade policies, more freight than ever before is moving across international boundaries.
- The rise of worldwide communications networks allow for the inexpensive and instantaneous transfer of information around the globe. These networks have allowed businesses to expand operations and markets and have given rise to new business models like e-commerce, leading to a higher volume of smaller, demand-responsive shipments.
- Access to good transportation services has allowed businesses to develop increasingly complex supply chains that are longer and far more specialized.

As a result of these global trends, U.S. international and domestic trade volumes are expected to grow at an accelerated rate. Trade volumes in Portland are expected to nearly double by 2040 to 600 million tons annually.\(^4\) This is expected to have a profound effect on shippers and the infrastructure they depend upon.

West Coast ports have been struggling to keep pace with the increasing volumes of marine and air cargo coming from Pacific Rim trading partners like Japan, China, South Korea and Taiwan. The Portland Harbor includes port terminals in both Portland and Vancouver and will likely have a longer-term trend of growth in freight volumes. In addition, the ports of Portland and Vancouver are not as constrained by dockside capacity as a number of other West Coast ports are so additional growth here can be handled at the ports.

According to the US census, total US trade with the Pacific Rim amounted to $1,170.7 billion in 2016. About $362 billion of that trade is exports. Most of the Portland-Metro region’s international trade is with Pacific Rim counties and was estimated to be $10.5 billion in 2016. Much of the Pacific Rim freight processed by West Coast ports is destined for the rest of the country. However, the financial burden of maintaining and expanding the publicly owned transportation system serving this national need falls to local West Coast trade gateway jurisdictions.

Canada and Mexico are also important trading partners with the USA. According to the Western Washington University Research Institute, the value of US exports to Canada in 2015 was $280.1 billion and the value of US exports to Mexico was $236.4 billion. The value of US imports from Canada in 2015 was $295.2 billion and the value of US imports from

Mexico was $294.7 billion. These numbers represent a rapid expansion of both imports and exports from our neighboring trading partners since 2002.

The goods movement industry has responded to this capacity crunch by employing larger trucks, rail cars, ships and planes. Long-haul trucks and ships carrying containers have trended toward increased size and capacity. However, small scale delivery associated with e-commerce is also growing at the same time. These trends place new demands on the goods movement infrastructure, and reinforce the need to reconsider our approach to providing a goods movement infrastructure that addresses both needs. Government and industry must also work together to address increasingly stringent safety and security requirements being placed on the goods movement system.

Against this backdrop of sustained expansion in global trade the region must prepare to compete globally. The viability of the regional and state economies, and the ability to attract and sustain business investment in both, depend upon it. Industry needs tangible and continuous improvements in the operating efficiency, capacity, modal redundancy and reliability of the regional goods movement system to remain competitive globally. Government must do its best to work with private sector stakeholders to accomplish this in a sustainable, environmentally sensitive and cost effective manner.

The regional goods movement system is falling short for some large shippers. Several traded sector firms in the region must truck their loads to San Francisco or Seattle/Tacoma to achieve satisfactory international aviation or marine connections. Some resource based industries and agricultural products served by the Portland metropolitan region’s goods movement system are very sensitive to transportation costs and can easily lose global market share with shipping cost increases measured in pennies per pound. Still other area manufacturers have had to repeatedly adjust production schedules to compensate for congestion on the region’s runways, roads and rail lines, leading to increased production costs and reduced productivity.

As shippers’ supply chain logistics evolve, the definition of “state of the art” warehousing and distribution centers continues to change dramatically. Larger truck-biased cross dock facilities are becoming the new standard.

The local component of the goods movement system is also critically important to the economy and daily life. The local movement of goods and services is focused primarily on trucks. The ability to maneuver on local streets and to park to unload freight is vital for those trying to deliver goods and services to local communities.

The region’s goods movement infrastructure and unique geographic location are competitive advantages that have created transportation sector jobs for more than a century. These jobs, in turn, serve the industrial and local freight needs of the Portland metro region, the state, the Pacific Northwest, the West Coast and the nation.
2.3 Efficient goods movement for the future

In the post-recovery world economy, strong growth in international, national and regional trade has once again driven the need for a flexible, adaptable, high performance multimodal freight transportation system. Efforts must consider these new stresses on marine, air, road, rail and pipeline networks and facilities. By 2040, the region’s goods movement system will need to absorb a near doubling of freight volumes, measured in tonnage by all freight modes, with approximately 75 percent of that dependent on trucks to link producers and consumers, or to reach intermodal nodes for import and export.5

Many local manufacturing firms that trade internationally, and who could locate globally, have chosen to make the greater Portland-Vancouver area their home because of its connections as an international transportation hub. These firms require a smoothly functioning goods movement system to operate efficiently and maintain profitability. In the absence of such a system, they will consider relocating to an area that meets these requirements.

And as the global economy recovers and grows, the Portland metro region will be called upon to address vastly expanded regional, national and international shipping needs reliably, safely, efficiently and sustainably. We have a responsibility to the region, the state and the nation to maintain an efficient and flexible goods movement system of sufficient capacity to meet future needs.

2.4 The Portland region is a global gateway

The ports of Portland and Vancouver processed 20.2 million metric tons of cargo in 2016. 12.7 million tons of cargo in Portland alone. Another 8 to 10 million tons of inland barge cargo also moves through these facilities. In addition to being the leading grain and mineral bulk harbor on the West Coast, the ports processed nearly 379,000 automobiles in 2016. The dollar value of foreign trade moving through the Portland Harbor was about $14 billion, with about $10 billion of that moving through Portland. Most of this cargo is transported beyond the Portland metro region, generally by truck and rail. There is also a huge support industry located in Portland associated with moving this freight.

The Portland Metro area’s industries collectively produced $158.8 billion in gross regional product, making it the country’s 20th largest metropolitan economy in 2015.6 Traded sector industries produce roughly 45 percent of gross regional product while employing 31 percent of workers.

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5 Port of Portland Commodity Flow Forecast, March 2015

The region’s six core clusters (defined in section 2.1) demonstrate the importance of traded sector industries to our economy. The clusters generated 20 percent of all the Portland metropolitan output in 2015.7

When comparing the clusters to one another, their differences reflect the large variation of our industrial base. The clusters vary in size (see figure 2 below), with the Computer and Software cluster having the largest output and employment, while Health Sciences and Technology has the smallest output and employment. In 2016, the Computer and Electronics, and the Software and Media clusters each employed more than 30,000 people. The Clean Technology and Green Cities cluster employed about 25,000 people. In 2016, the leaders for gross regional product were the Computer and Software cluster with nearly $12 billion, and the Software and Media cluster with nearly $6 billion.

**Figure 2:** Portland MSA focus clusters: Various performance measures, 2016

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7 Portland Economic Value Atlas Market Scan (The Brookings Institute) August 2017
As the figure below shows, the Portland-Vancouver region had a growth in export volume of 166% between 2003 and 2013. This growth made the Portland-Vancouver region the fifth-fastest growing export market among the 100 largest metropolitan areas and the region was 13th largest by export volume in 2013.

**Figure 3: Real Export Growth 2003-2013**

- The Port of Portland also operates the largest international airport in Oregon. Portland International Airport acts as the air freight hub for much of Oregon and Southwest Washington. Approximately $1.9 billion of international air freight cargo was shipped through Portland International in 2016.

- Oregon’s total exports rose by 9.3% in 2016, and Oregon was the only state among its Pacific neighbors to post a net gain in dollar value. 8

- The 2015 Commodity Flow Forecast uses the 2007 commodity flow survey, and projects an overall doubling of freight tonnage moved in the region by 2040. Imports and exports are projected to grow much faster than domestic freight tonnage moved in the region. Between 2007 and 2040, the tonnage of imports is projected to increase an average of 3.2% per year; and exports are projected to increase an average of 3.0% per year. Currently one in ten jobs in Oregon is transportation-related. Though the Port of Portland is sufficiently diversified to bear a temporary downturn better than some, there are many employers, large and small, who make up the Port of Portland’s customer base that could be hit hard.

Mounting congestion and capacity issues on several freight modes could impede the region’s ability to compete globally. Regional congestion and capacity issues already impact several national goods movement corridors traversing the region, including freight rail and trucking corridors.

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8 Portland Business Journal April 2017
Washington is the most trade dependent state in the U.S. and Oregon is the 9th most trade-dependent state. If the region is to maintain its status as an international freight gateway, steps must be taken to ensure that a flexible, adaptable, efficient and reliable goods movement system is in place. Cooperation with agencies and stakeholders across the state border with Washington is critical to make sure that freight throughways and access to primary hubs are seamless and that needed improvements are coordinated.

Deliveries of daily necessities increase with population and jobs
Modern urban life would be impossible without local goods movement. Nearly all the foodstuffs, clothing, housing materials, medical supplies, etc. that residents rely on daily come from outside the region.

Local suppliers and retailers require good connections to regional, national and international goods movement systems. They also need reasonably sized lane widths, curve and curb radii and loading zones.

2.5 Regional competitiveness requires cooperation across jurisdictions

The Portland-Vancouver area is a globally competitive international gateway and domestic hub for commerce. While Portland’s status as Oregon’s economic crossroads permits the region to have a vibrant, diverse and flourishing economy, it also carries certain responsibilities. The multimodal freight transportation system is a foundation for economic activities and we must strategically maintain, operate and expand it in a timely manner to ensure a vital and healthy economy.

This Regional Freight Strategy identifies mode-specific issues, policies, strategies and investments designed to meet those responsibilities and support a truly multimodal, sustainable freight network within the Portland metro region. A systems approach to planning and managing our multimodal freight transportation infrastructure must recognize and coordinate both regional and local transportation and land use decisions to maintain seamless freight and goods flow and access that benefit us all.

The recommended actions will necessarily require collaboration between public and private sectors, the coordination of freight modes that are often competitors, and the reconciliation of institutional, jurisdictional and political perspectives. Yet stakeholders have shown a strong interest in and commitment to improving freight mobility and access and reducing freight’s impacts on the communities it serves.
2.6 Congestion’s costs

Traded sector industries require well-integrated and highly efficient international and domestic transportation connections to stay competitive in the global economy. These firms have historically located in the region to take advantage of the pipeline, rail, marine, aviation and highway connections it offers.

Increased roadway congestion and decreased system reliability have adversely impacted the productivity of traded sector firms throughout the region. This has led to decreases in equipment productivity, increased labor costs and inefficient use of fuel, leading to increased pollution for combined air cargo, trucking, pipeline, marine and rail carriers.\textsuperscript{9}

Each of these modes relies on the regional road system for some portion of their operations and all are impacted by congestion.

Manufacturers, shippers and distributors in the region operate in a time sensitive production environment, with each operating under a unique set of parameters. Missing critical connections due to transportation system failure costs these firms significant sums of money. This leads companies to consider relocating outside the region or prevent companies from starting up operations in the region.

2.7 Jobs and trade

As the region grows, the health of residents and communities will depend on decision makers who appreciate the interdependence of economic, transportation and land use goals. The logistics and freight transportation sectors perform the vital task of distributing the myriad of goods that Oregonians consider essential to the maintenance of our households, businesses and communities. Additionally, this sector provides tens of thousands of jobs to the region by facilitating the transport or trans-shipment of goods entering the region via various freight modes and routes to intermediate or end users. These firms provide family wage employment that is a critical element in sustaining the region’s high quality of life for all.

2.8 Freight-oriented expansion supports middle income jobs

In 2015, with the assistance of the City of Portland, Port of Portland, Associated Oregon Industries, Oregon Business Association, and the Oregon Business Council, the Portland Business Alliance published “Middle-income jobs in the Portland-metro economy”. The report explores the current conditions of middle-income jobs and workers in the Portland metro area. Middle-income is defined as an annual income between $29,420 and $50,360 based on median wages in 2013. Two additional categories for lower-middle incomes ($29,420 to $35,170) and upper-middle incomes ($40,730 to $50,360) were established to more accurately track the trends in wage polarization.

\textsuperscript{9} Cost of Congestion to the Economy of the Portland Region (Economic Development Research Group)
The report found that in the Portland-metro area the jobs that comprise these income ranges mainly include manufacturing, production, sales and administrative support roles. Many middle-income jobs are also impacted by local markets and populations – these often include teachers, and trade workers – both of which are impacted by business cycles.

Between the years 1980 and 2013 the number of high-wage jobs increased by 185% and low wage jobs by 161%. In contrast, during this same period upper-middle wage jobs only grew by 103% and lower-middle jobs only saw an increase of 47%. This growth distribution was not limited to the Portland-metro area, in fact, both the aspirational city group and peer city group saw similar distributions of growth – the figures below more clearly express this.

Figure 4: Change in employment by wage group, peers

Source: U.S. Census Bureau; ECONorthwest calculations.
The report also focuses on the decrease of overall employment share that middle-income jobs hold. In 1980, middle-wage jobs represented 69% of Portland-metro's overall employment. By 2013, that number had decreased by 12 percentage points to a share of just 57% (an 18% decrease).

In addition to the share of middle-wage jobs declining, increases to real median wages within middle-wage jobs stagnated. Both peer and aspirational data sets show a substantial increase in median income of high-wage jobs, minor increases in low-wage jobs – and in all but one case (see Cincinnati) – the least substantial change impacting middle-wage jobs. When compared to the aspirational cities, Portland-Metro performed the worst in growth of median wages in every category except high-wage.
The Brooking Institute reports that the median annual wage for the Portland region, from 2001 to 2016, increased by $10,000 ($30,000 to $40,000), while those with the 75th percentile wages (highest) have grown by over $20,000 ($45,000 to $65,000). Those with 25th percentile wages (lowest) have seen even flatter growth relative to others, growing only by $7,000 ($21,000 to $28,000).

Findings of “Middle-income jobs in the Portland-metro economy”

The result of all this data indicates that wage polarization continues to impact the Portland-Metro area.

It is important to come up with strategies that help make the region accessible and affordable for anyone who wants to live here. The report offers multiple strategies for combating the effects of the declining share of middle-wage jobs. These strategies are summarized as:

- **Education** – Regions that invest in education and training will be more resilient to the changes new technology has on jobs. Greater emphasis should be placed on closing the education achievement gap so that all workers, including underserved groups, have equal access to better-paying jobs.

- **Protection of existing job corridors** – Many middle-income jobs have been tied to geographical locations; for our region these primarily include the industrial sectors along the Columbia and Willamette rivers. Policies that protect and support the

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Figure 6: Growth in real median wages by wage group, peers, 1980-2013

Source: U.S. Census Bureau; U.S. Bureau of Labor Statistics; ECONorthwest calculations

10 Portland Economic Value Atlas Market Scan (The Brookings Institute) August 2017
further development of jobs in these industrial areas have the potential to play a significant role in the maintenance of a stable and secure middle-income demographic.

- **Trade** – For our region, trade expansion means job growth. Trade-related jobs are wonderful sources for middle-wage growth, and jobs in this sector also support local-service industries that are also significant drivers of middle-wage jobs including manufacturing, education and health care.

- **Facilitation of growth corridors** – Many middle-income jobs are located in the growing technology centers in western Washington County, and around medical centers. It is important for government and the private sector to understand the factors that support growth and develop policies that support these growing job centers.

- **Infrastructure** – As mentioned earlier, a large portion of middle-income jobs are along rivers and key highways. Infrastructure maintenance and improved access is critical to retaining and growing middle-income jobs in these areas. Policy makers should focus on ensuring that the region’s port facilities are thriving and that intermodal connector and highway congestion points are being addressed.

- **Workforce housing** – If leaders truly support the preservation of middle-income jobs, effort must be made to make living in the region an obtainable goal.

### 2.9 Invest now to boost the triple bottom line: People, planet, profit

The Portland-Vancouver area is a globally competitive international gateway and domestic hub for commerce. The multimodal freight transportation system is a foundation for economic activities and we must strategically maintain, operate and expand it in a timely manner to ensure a vital and healthy economy. And with many new residents expected in the Portland metro region by 2040, family wage job creation will be of paramount importance. Freight policies and programs should be refined and implemented to ensure that the Portland metro region is flexibly and securely positioned for the future of freight and goods movement.

Concrete freight-related projects must be built to ensure that the goals of the Regional Freight Strategy are met. Maintaining the Portland region’s historic preeminence as a goods movement and industrial hub must remain a regional priority. Regional infrastructure investment discussions should consider impacts to the local, regional and national economy in addition to looking for cost-effective solutions. Identified benefits - including those accruing to freight - must be conserved over time through regional policy and system management and monitoring. Investment in smart, strategic and green freight system improvements can help the region secure not only its economic future by increasing its share of family wage jobs but also support the development of a green economy that is the Portland-Metro area trademark.
CHAPTER 3 REGIONAL FREIGHT VISION

3.1 Regional Freight Vision Framework

Informing the regional framework for freight policy is the understanding that the Portland-Vancouver region is a globally competitive international gateway and domestic hub for commerce. The multimodal freight transportation system is a foundation for economic activities and we must strategically maintain, operate and expand it in a timely manner to ensure a vital and healthy economy.

The Regional Freight Strategy addresses the needs for freight through traffic as well as regional freight movements, and access to employment, industrial areas, and commercial districts.

3.2 Regional Freight Concept

The Regional Freight Network Concept contains policy and strategy provisions to develop and implement a coordinated and integrated freight network to help the region’s businesses attract new jobs and remain competitive in the global economy.

The transport and distribution of freight occurs via the regional freight network, a combination of interconnected publicly and privately owned networks and terminal facilities. The concept in Figure 7 shows the components of the regional freight system and their relationships.

Rivers, mainline rail, pipeline, air, truck routes and arterial streets and throughways connect the region to international and domestic markets and suppliers beyond local boundaries. Inside the region, throughways and arterial streets distribute freight moved by truck to air, marine and pipeline terminal facilities, rail yards, industrial areas and commercial centers. Rail branch lines and heavy vehicle corridors connect industrial areas, marine terminals and pipeline terminals to rail yards and truck terminals. Pipelines transport petroleum products to and from terminal facilities.

*Note: Figure 7: Regional freight concept will also be in Chapter 2 of the updated RTP.*
The Regional Freight Network map, shown as Figure 8 at the end of this chapter, applies the regional freight concept on the ground to identify the transportation networks and freight facilities that serve the region and state’s freight mobility needs.

### 3.3 Regional Freight Network Classifications and Map

The Regional Freight Network map has been updated for the latest Regional Freight Strategy and is significantly different than the one found in the 2014 Regional Transportation Plan and the 2010 Regional Freight Plan. To show the continuity of the freight system in both Oregon and Washington State, the regional map now shows the freight routes in Clark County, north of the Columbia River. The previous Regional Freight Network map was difficult to read and many of the main roadway routes and road connectors were covered up by the main rail lines and branch rail lines. The updated Regional Freight Network map now has the main roadway routes and road connectors as the top Geographic Information System layers and has offset the rail lines where possible to make them more visible. The Regional Freight Strategy now features the Regional Freight Network map as an 11x17 inch map to enhance readability. To highlight the importance of the rail network, and have better visibility for the rail lines that are still partially hidden on the main map, the updated Regional Freight Network map has added six inset maps (brown dotted line boxes) that focus on the key intermodal facilities (marine terminals, rail yards and pipeline facilities) and rail lines. These inset maps are located on the back side of the main map (see the next page).

The other major update to the Regional Freight Network map is the addition of a new freight roadway designation for Regional Intermodal Connectors. The Regional Intermodal Connectors represent National Highway System (NHS) intermodal connectors and other Tier 1 intermodal connectors that were designated by ODOT as part of the Oregon Freight Intermodal Connector System (OFICS) Study completed in 2017. The description and importance of NHS intermodal connectors and other Tier 1 intermodal connectors is described in the next section of this strategy.

### 3.4 Regional Freight Network and Intermodal Connectors

National Highway System (NHS) intermodal connectors are roads that provide the “last-mile” connections between major rail, port, airport, and intermodal freight facilities and the rest of the National Highway System. NHS Intermodal Connectors are defined by the FHWA’s Freight Management and Operations as “roads that provide access between major intermodal facilities and the other four subsystems making up the National Highway System.” The four subsystems are Interstates; Other Principal Arterials; the Strategic Highway Network; and Major Strategic Highway Connectors. NHS intermodal connectors

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11 FHWA Freight Management and Operations NHS Connectors
account for less than one percent of total nationwide NHS mileage but these roads are critical for the timely and reliable movement of freight.

**Oregon Freight Intermodal Connector System (OFICS) Study**

The Oregon Freight Intermodal Connector System (OFICS) Study was completed by ODOT in April 2017 and defined and identified freight intermodal terminals and intermodal connectors within the Portland region (and the rest of Oregon). Freight intermodal terminals are defined as facilities which provide for the transfer of freight from one freight mode to another. Examples include the NHS intermodal terminals such as Port of Portland’s Terminal 5 and Union Pacific’s Brooklyn Yard. Smaller intermodal terminals and businesses that use more than one freight mode onsite, along with the smaller intermodal terminals are defined as “Intermodal Terminals/Businesses” (ITB), and were identified by the study.

The OFICS Study identified the locations of new intermodal connectors using the following criteria:

- They must be a public road
- They must serve as a primary access between an ITB and a state highway or an existing NHS intermodal connector
- Be a maximum length of 5 miles unless a longer length is justified

A review of the existing NHS Intermodal Connectors was completed as part of the study. The review determined if the connectors still met the FHWA’s criteria for NHS Intermodal Connectors. All of the NHS Intermodal Connectors in the Portland region meet the NHS primary criteria of an average of 100 trucks in each direction per day.

Since a wide range of freight activity occurs on intermodal connectors, the study developed three tiers that sort the already recognized and new intermodal connectors by levels of importance. One of the main criteria for determining which tier an intermodal connector should be in is the average number of trucks per day on the intermodal connector. Sometimes this data was difficult to obtain so the study developed other criteria. The Tier 1 Primary Intermodal Connectors must meet the NHS Intermodal Connector criteria, which generally include:

- 50,000 TEUs/year or 100 trucks/day in each direction
- Secondary Criteria: Connecting routes targeted by the state or MPO to address existing deficiency caused by increased traffic

The study defined Tier 2 Secondary Intermodal Connectors and Tier 3 Minor Intermodal Connectors. However, Metro determined that these intermodal connectors that don’t meet NHS criteria, and have less than 100 trucks/day each direction or serve smaller ITBs, are

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12 USDOT Federal Highway Administration, Freight Intermodal Connectors Study, April 2017

13 TEU is a Twenty-foot Equivalent Unit that is equal to a 20 foot shipping container
not of regional significance and are not included on the Regional Freight Network map. The Regional Freight Network map includes the Tier 1 Primary Intermodal Connectors and designates them as Regional Intermodal Connectors.

The Tier 1 intermodal connectors are the highest level of connectors and are considered as the primary classification in Oregon. The majority of the state’s and the Portland region’s ITBs are served by the Tier 1 intermodal connectors. In the Portland region the Tier 1 intermodal connectors consist of 16 existing NHS intermodal connectors and 3 recommended additional intermodal connectors. The three additions meet the NHS Intermodal Connector Criteria, and ODOT recommended to FHWA that these three additional intermodal connectors be designated as NHS intermodal connectors. These three additions are:

- North Rivergate Blvd. – between Terminal 5 and multiple ITBs, and N. Lombard St.
- North Leadbetter Road – a loop road south of Marine Dr. between the Terminal 6 access road and Portland French Bakery.
- NE Alderwood Road – between NE Cornfoot Road and Columbia Blvd.

**Regional Intermodal Connectors**

It is important to understand the truck usage and performance of the region’s Tier 1 and NHS intermodal connectors since they have a direct impact on goods movement efficiency and the health of the region’s economy. Marine terminals, truck to rail facilities, rail yards, pipeline terminals, and air freight facilities are the primary types of intermodal terminals and businesses that the Tier 1 and NHS intermodal connectors are serving in the Portland Metro region. An example of a NHS intermodal connector is Marine Drive between the marine terminals (Terminal 5 and 6) and I-5; which in 2014 had over 4,100 average daily trucks. Another NHS intermodal connector is Columbia Boulevard between I-5 and OR 213 (82nd Avenue) which had over 3,500 average daily trucks and is a vital freight connection between the air freight terminal at Portland International and both I-5 and I-205. Another example is NW Front Avenue/NW 26th Drive that provides a vital connection between the energy pipeline terminals (near NW 61st), and marine Terminal 2 and US 30, which had between 568 and 866 average daily trucks.

These Regional Intermodal Connectors are carrying many more trucks than the typical road connectors on the Regional Freight Network map. They are also of critical importance for carrying commodities that are being exported from and imported into the state and across the county.

**3.5 Regional Freight Network Policies**

In 2008, the Regional Freight and Goods Movement (RFGM) Task Force developed six goal statements to elaborate a policy framework that would protect and improve the cost-effective functioning of the critical regional freight network. They also developed five policies to serve as the foundation of the freight network concept that somewhat mirrored the goal statements but did not exactly match.
As part of the 2018 update to the Regional Freight Strategy, the intent of the RFGM Task goal statements has been maintained by combining them with the RFGM Task Force policies, and for consistency and simplicity, renaming them the Regional Freight Policies. In addition, the Metro Council directed staff to add a new policy (Policy 7) that addresses the issue of freight safety regarding the interaction of different freight modes (trucks, railroad trains, etc.) with passenger cars, bicyclist and pedestrians. These freight network policies were used to develop the freight actions that are outlined in Chapter 8. The following are the seven freight policies that guide the Regional Freight Strategy:

- **Policy 1:** Plan and manage our multimodal freight transportation infrastructure using a systems approach, coordinating regional and local decisions to maintain seamless freight movement and access to industrial areas, and intermodal facilities.

- **Policy 2:** Manage first-rate multimodal freight networks to reduce delay, increase reliability, improve safety and provide shipping choices.

- **Policy 3:** Better integrate freight issues in regional and local planning and communication to inform the public and decision-makers on the importance of freight and goods movement issues.

- **Policy 4:** Pursue a sustainable multimodal freight transportation system that supports the health of the economy, communities and environment through clean, green and smart technologies and practices.

- **Policy 5:** Protect critical freight corridors and access to industrial lands by integrating freight mobility and access needs into land use and transportation plans and street design.

- **Policy 6:** Invest in our multimodal freight transportation system, including road, air, marine and rail facilities, to ensure that the region and its businesses stay economically competitive.

- **Policy 7:** Eliminate fatalities and serious injuries caused by freight vehicle crashes with passenger vehicles, bicycles, and pedestrians, by improving roadway and freight operational safety.

*Figure 8* on the next page shows the Regional Freight Network Map.
CHAPTER 4 REGIONAL FREIGHT NEEDS AND ISSUES

4.1 Overview of Issues

In 2017, the Regional Freight Work Group (RFWG) reaffirmed that the following six problem areas need to be targeted:

- congestion and hotspots – chronic road and rail network bottlenecks that impede regional freight/goods movement
- reliability – unpredictable travel time due to crashes, construction, special events and weather
- capacity constraints due to physical and operational issues as well as lack of capacity in critical corridors
- network barriers – safety concerns and out of direction travel resulting from weight-limited bridges, low bridge clearances, steep grades, at-grade rail crossings and poorly designed turns or intersections
- land use – system capacity and land for industrial uses that is being lost to other activities
- impacts – managing adverse impacts including diesel emissions, greenhouse gas emissions, water quality, noise and land use conflicts

In line with sound regional planning practice, a systems approach must be taken in order to produce important outcomes such as reduced delay, better travel time reliability, safer travel across all modes and trip types, and broader shipping choices and better customer service to help area businesses remain competitive. Such an approach must also consider the economic context in which projects are built, and link transportation investment decisions to the local, regional and national economy.

4.2 Specific needs identification

The Regional Freight Work Group had open discussions that allowed them the opportunity for identifying challenges affecting freight and goods movement on the designated Regional Freight Network. A summary by mode of the RFWG’s current constraints, challenges, and opportunities for freight and goods movement follows.

Constraints, challenges and opportunities on roadways and highways

- Increased congestion and congestion spreading over more hours per day on I-5 north of the Freemont Bridge (I-405).
- Capacity constraints exist at the Columbia River Bridge on I-5.
- Traffic constraints on roadway connections and intermodal connectors to I-5 are causing goods movement delays.
- I-5 at the Rose Quarter has been identified as a major traffic constraint.
• Highway 217 south of Beaverton-Hillsdale Highway has been identified as a major traffic constraint.

• Intra-county freight movements such as high value commodities from Washington County that need to get to the air freight facility near PDX in Multnomah County are experiencing long delays for extended periods of the day.

• Increased congestion and congestion spreading over more hours per day on US 26 (west of downtown Portland) create traffic constraints that cause trucks to avoid the freeway and travel out of direction on NW Cornelius Pass Road (north of US 26) and Highway 30 as an alternative route to avoid delays and unreliable travel times.

• For truck trips, NW Cornelius Pass Road has curvature and other design issues that need to be addressed.

• Increased demand for trucking on the region’s freeway systems presents a major challenge to moving freight during congested hours.

Constraints, challenges and opportunities on and around rail lines

• Rail speed is slow, with some industrial trains a mile long (100+ cars), and at-grade railroad crossings cause major traffic impacts on the roadway system.

• Grade separating rail crossings at many more locations in the region presents a challenge. An example is the need for grade separation of the Union Pacific line as it crosses SE 8th Ave., SE Milwaukie Ave., and SE 12th Ave. (south of SE Division St.). The current at-grade crossings cause major delays to cars and trucks on the street network around these crossings in an active industrial area. This delay is amplified when freight trains and scheduled Light Rail Transit occur within a short time of one another.

• Freight rail demand on shared rail tracks at North Portland and Peninsula Junction is causing long delays to other freight trains and passenger trains (Amtrak). In 2017 the Oregon Transportation Commission approved an $8.2 million Connect Oregon VI project for rail improvements at North Portland Junction. However, improvements at Peninsula Junction were not included in this project.

• The Union Pacific Kenton Line that runs adjacent to Sandy Boulevard needs some double-tracking to address rail capacity constraints.

• There is an opportunity to address the issue of double-tracking with the Kenton Rail Line Study.

• Short term need for speed improvements to the Union Pacific Railroad line just north of the Steel Bridge river crossing. The current train speeds are 6 mph in the curves and would require a realignment of the tracks to improve speed.

• Capacity constraints on major rail lines in the region may require consideration of more double-tracking to: 1) improve freight train reliability; and 2) provide staging locations for freight trains off-line of the Seattle/Portland/Eugene passenger train corridor.
Constraints, challenges and opportunities around air freight

- Providing increased access to the Portland Airport (PDX) and consolidation facilities is limited by the existing routes. Air freight demand will grow as the area’s population grows.

- The US Post Office has moved to NE Cornfoot Road near PDX. Increased truck demand, construction project impacts and overall traffic in the airport area will cause delays.

- The Westside Logistics Study showed computer and electronics shipments face constraints getting to the air freight facility on Air Trans Way with congestion and reliability issues on US 26 (Sunset Highway) causing delays and other freight routing to get to east Portland.

Constraints, challenges and opportunities around energy pipelines

- Pipelines that supply fuels and other energy sources to the region are clustered along the Willamette River in the NW Portland Industrial area face the costs and challenges of retrofits for seismic resiliency.

- There are also financial challenges with providing seismic retrofits for resiliency on the regional freight system.

Constraints, challenges and opportunities for Marine/River (ships and barges)

- Providing more marine terminal space could be challenging.

- Deepening the Willamette River Channel for shipping has high costs and environmental challenges.

- There is a need to restore full container service at Terminal 6 (see “Loss of Container Service at Terminal 6” in Chapter 5, p.#60). The impacts and short term challenges for commodity movement and freight modal changes have been addressed by ODOT and the Port of Portland. However, the long term opportunities are still being explored.

- The barges on the Columbia River cause the lift span on the I-5 Bridge to open when the river rises over six feet. There have been some years with nine months of high water.

- The location of the narrow opening of the railroad bridge (adjacent to the I-5 Bridge) makes for a difficult s-curve maneuver of barge traffic on the Columbia River that comes under these two bridges without lifting the I-5 Bridge. Barge safety is a major concern at this location. Barge traffic must avoid causing I-5 bridge lifts during peak traffic periods. During high water bridge lifts on I-5 cause major traffic delays even during off-peak hours.

- There is a need to restore operations of the Willamette Falls Locks to expand freight traffic on the Willamette River and reduce demand for trucks on the highways coming into the region. The historic Willamette Falls Locks in West Linn “were built
in the early 1870s to move river traffic around the 40-foot horseshoe-shaped basalt ridge between Oregon City and West Linn” (US Army Corps of Engineers website).

Since December 2011, the Willamette Falls Locks have been in “non-operational status”.

Table 3 provides a categorized list of the key issues.

### Table 3: Priority Issues for Freight and Goods Movement

<table>
<thead>
<tr>
<th>Issue category</th>
<th>Key issues</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mobility and accessibility</strong></td>
<td>• Road congestion on regional truck routes</td>
</tr>
<tr>
<td></td>
<td>• Travel time reliability on regional truck routes</td>
</tr>
<tr>
<td></td>
<td>• Accessibility between intermodal terminals, industrial areas, centers and the interstate highway system</td>
</tr>
<tr>
<td></td>
<td>• Class 1/short line rail – throughput and velocity, capacity constraints in rail yards, sidings</td>
</tr>
<tr>
<td></td>
<td>• Improved rail access and service for regional shippers</td>
</tr>
<tr>
<td></td>
<td>• Barriers: weight/vertical clearance issues on bridges; gaps in connectivity (new roads/bridges)</td>
</tr>
<tr>
<td></td>
<td>• Safe barge navigation in I-5/BNSF bridges area</td>
</tr>
<tr>
<td></td>
<td>• At-grade rail crossings – grade separation</td>
</tr>
<tr>
<td></td>
<td>• River channel deepening</td>
</tr>
<tr>
<td><strong>System management</strong></td>
<td>• Preservation and efficient use of existing capacity</td>
</tr>
<tr>
<td></td>
<td>• Intelligent Transportation System tools (signal timing, cameras)</td>
</tr>
<tr>
<td></td>
<td>• Access management</td>
</tr>
<tr>
<td></td>
<td>• Increase in truck crash rate</td>
</tr>
<tr>
<td></td>
<td>• Faster response to roadway incidents (crashes)</td>
</tr>
<tr>
<td></td>
<td>• Truck parking: hours of service limitations</td>
</tr>
<tr>
<td></td>
<td>• Efficient loading/unloading operations in commercial centers</td>
</tr>
<tr>
<td></td>
<td>• Advances in traveler information (road conditions, directional signage)</td>
</tr>
<tr>
<td></td>
<td>• Workforce access to industrial and employment areas</td>
</tr>
<tr>
<td></td>
<td>• Maintenance dredging and Willamette Falls Locks repair</td>
</tr>
<tr>
<td></td>
<td>• Rail system management (directional running, grade crossing info)</td>
</tr>
<tr>
<td></td>
<td>• Modal redundancy</td>
</tr>
<tr>
<td><strong>Land use</strong></td>
<td>• General population growth and impacts to transportation system</td>
</tr>
<tr>
<td></td>
<td>• Competition between industrial and other uses for interchange capacity</td>
</tr>
<tr>
<td></td>
<td>• Adequate supply of industrial land served by transportation system (i.e., marine accessible)</td>
</tr>
<tr>
<td></td>
<td>• Incompatible land uses along rail lines and major truck corridors</td>
</tr>
<tr>
<td></td>
<td>• Accommodation of truck delivery in pedestrian-friendly areas and corridors (street design trade-offs)</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td>• Air quality impacts from diesel engine emissions</td>
</tr>
<tr>
<td></td>
<td>• Residential noise impacts from truck, rail and air cargo operations</td>
</tr>
<tr>
<td></td>
<td>• Water quality</td>
</tr>
</tbody>
</table>
In 2017, the Regional Freight Work Group reaffirmed that this list of key issues has the appropriate categories and issues that the Regional Freight Strategy should continue to address.

### 4.3 Key issues that have been addressed

A sizable number of significant freight studies have been completed since the completion of the Regional Freight Plan (2035) in June of 2010 that identified and addressed important freight issues in the region. These analysis reports and studies address freight needs, along with freight delay and access issues that the 2010 Regional Freight Plan had not yet explored. The following sections provide summaries of nine of these key freight studies, categorized by the freight issue that was addressed:

#### Freight bottlenecks and congestion

**Portland Region - 2016 Traffic Performance Report (ODOT Region 1)**

The 2016 Traffic Performance Report was produced by Region 1 at ODOT, and provides information on the health of the region's freeway system. It establishes a baseline for long-term monitoring that will enable Oregon Department of Transportation (ODOT) to better understand the urban freeway traffic mobility conditions of the system.

Traffic congestion is directly affecting freight in the region. The increasing congestion is moving into the mid-day hours. In the past, freight relied on the congestion-free mid-day hours to move goods and services in the region. As mid-day hours become more unreliable, freight is having more problems meeting delivery schedules and the cost of shipping is increasing.
Overall, the number of crashes for the region’s six freeway corridors has continued to increase in parallel with growing congestion. However, analysis of individual corridors shows the crash trend has declined or stabilized after construction of targeted operations and safety projects.

**Corridor-level performance**
The traffic data indicate the region’s travel speeds and travel reliability are systematically getting worse. The following tables show indicators for corridors with the slowest average weekday speed (mph) and corridors with the least reliable travel. Buffer time is a measure of reliability. It is the extra time or cushion a traveler should add to their trip to ensure on-time arrival (95% of the time). Increasing buffer time equates to reliability getting worse.
Figure 9: Corridor-Level Performance

Corridor-level performance

Region’s corridors with slowest average weekday speed (mph)

<table>
<thead>
<tr>
<th>Corridor Location</th>
<th>Time of Day</th>
<th>2013</th>
<th>2015</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-405 SB</td>
<td>12</td>
<td>31.9</td>
<td>29.0</td>
<td>-2.9</td>
</tr>
<tr>
<td>I-405 NB</td>
<td>12</td>
<td>33.8</td>
<td>30.2</td>
<td>-3.6</td>
</tr>
</tbody>
</table>

I-405’s average speed for the PM period is the lowest in the region.

<table>
<thead>
<tr>
<th>Corridor Location</th>
<th>Time of Day</th>
<th>2013</th>
<th>2015</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-5 SB</td>
<td>12</td>
<td>36.4</td>
<td>31.5</td>
<td>-4.9</td>
</tr>
<tr>
<td>I-5 NB</td>
<td>12</td>
<td>42.3</td>
<td>38.2</td>
<td>-4.1</td>
</tr>
</tbody>
</table>

I-5’s average speed for the PM period is among the lowest in the region, with a significant degradation of speed from 2013 to 2015.

<table>
<thead>
<tr>
<th>Corridor Location</th>
<th>Time of Day</th>
<th>2013</th>
<th>2015</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-205 SB</td>
<td>12</td>
<td>42.6</td>
<td>35.4</td>
<td>-7.2</td>
</tr>
</tbody>
</table>

I-205’s average speed for the PM period is among the lowest in the region, with the largest degradation of speed from 2013 to 2015.

<table>
<thead>
<tr>
<th>Corridor Location</th>
<th>Time of Day</th>
<th>2013</th>
<th>2015</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR 217 SB</td>
<td>12</td>
<td>32.4</td>
<td>35.3</td>
<td>+2.9</td>
</tr>
</tbody>
</table>

OR 217 SB’s average speed for the PM period is among the lowest in the region, but it has shown a slight improvement in speed. This is a result of the Active Traffic Management implementation project in 2014.

Weekday system speed by time of day

2013 vs. 2015

2016 Portland Traffic Performance Report
Oregon Department of Transportation

Region’s top recurring bottlenecks

These are the most severe recurring bottlenecks for each corridor

<table>
<thead>
<tr>
<th>Bottleneck location</th>
<th>2013</th>
<th>2015</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-5 NB</td>
<td>1:30 PM - 7:30 PM</td>
<td>1:30 PM - 7:30 PM</td>
<td>--</td>
</tr>
<tr>
<td>Rose Quarter</td>
<td>7:45 AM - 9:45 AM</td>
<td>7:45 AM - 9:45 AM</td>
<td>+2.0 hrs</td>
</tr>
<tr>
<td>Rosa Parks Way</td>
<td>12:30 PM - 2:00 PM</td>
<td>11:00 AM - 1:00 PM</td>
<td>+6.5 hrs</td>
</tr>
<tr>
<td>I-205 E</td>
<td>12:00 PM - 2:00 PM</td>
<td>12:00 PM - 2:00 PM</td>
<td>+0.5 hrs</td>
</tr>
<tr>
<td>Rose Quarter</td>
<td>3:45 PM - 5:15 PM</td>
<td>3:45 PM - 5:15 PM</td>
<td>+0.75 hrs</td>
</tr>
<tr>
<td>Glenn Jackson Bridge</td>
<td>2:15 PM - 4:00 PM</td>
<td>2:15 PM - 4:00 PM</td>
<td>--</td>
</tr>
<tr>
<td>Division</td>
<td>2:30 PM - 4:15 PM</td>
<td>2:30 PM - 4:15 PM</td>
<td>--</td>
</tr>
<tr>
<td>US 26 EB</td>
<td>7:00 AM - 9:00 AM</td>
<td>6:30 AM - 8:30 AM</td>
<td>+2.25 hrs</td>
</tr>
<tr>
<td>Hall Blvd</td>
<td>7:00 PM - 9:00 PM</td>
<td>7:00 PM - 9:00 PM</td>
<td>+1 hour</td>
</tr>
<tr>
<td>OR 217 NB</td>
<td>7:15 PM - 9:00 AM</td>
<td>7:15 PM - 9:00 AM</td>
<td>--</td>
</tr>
<tr>
<td>Denny Rd</td>
<td>7:00 AM - 9:00 AM</td>
<td>7:00 AM - 9:00 AM</td>
<td>--</td>
</tr>
</tbody>
</table>
**Figure 10: Travel Time Reliability Summary**

Region’s reliability

**Travel time reliability summary**

Source: FHWA-NMUDOT

<table>
<thead>
<tr>
<th>Corridor location</th>
<th>Time of day</th>
<th>2013</th>
<th>2015</th>
<th>Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-5 NB</td>
<td>PM</td>
<td>35.5</td>
<td>38.4</td>
<td>+2.9</td>
<td>8.2%</td>
</tr>
<tr>
<td>I-5 SB</td>
<td>PM</td>
<td>34.0</td>
<td>46.1</td>
<td>+12.1</td>
<td>35.6%</td>
</tr>
<tr>
<td>I-205 NB</td>
<td>PM</td>
<td>31.2</td>
<td>43.4</td>
<td>+12.2</td>
<td>39.1%</td>
</tr>
<tr>
<td>I-405 NB</td>
<td>PM</td>
<td>3.7</td>
<td>6.7</td>
<td>+3.0</td>
<td>81.1%</td>
</tr>
<tr>
<td>I-405 SB</td>
<td>PM</td>
<td>4.4</td>
<td>6.2</td>
<td>+1.8</td>
<td>40.9%</td>
</tr>
<tr>
<td>US 26 EB</td>
<td>PM</td>
<td>16.2</td>
<td>17.8</td>
<td>+1.6</td>
<td>9.8%</td>
</tr>
<tr>
<td>OR 217 SB</td>
<td>PM</td>
<td>7.6</td>
<td>8.1</td>
<td>+0.5</td>
<td>6.6%</td>
</tr>
</tbody>
</table>

**Corridors with least reliable travel**

<table>
<thead>
<tr>
<th>Corridor location</th>
<th>Time of day</th>
<th>2013</th>
<th>2015</th>
<th>Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-5 NB</td>
<td>PM</td>
<td>34.0</td>
<td>46.1</td>
<td>+12.1</td>
<td>35.6%</td>
</tr>
<tr>
<td>I-205 NB</td>
<td>PM</td>
<td>31.2</td>
<td>43.4</td>
<td>+12.2</td>
<td>39.1%</td>
</tr>
<tr>
<td>I-405 NB</td>
<td>PM</td>
<td>3.7</td>
<td>6.7</td>
<td>+3.0</td>
<td>81.1%</td>
</tr>
<tr>
<td>I-405 SB</td>
<td>PM</td>
<td>4.4</td>
<td>6.2</td>
<td>+1.8</td>
<td>40.9%</td>
</tr>
<tr>
<td>US 26 WB</td>
<td>PM</td>
<td>2.0</td>
<td>5.4</td>
<td>+3.4</td>
<td>89.0%</td>
</tr>
</tbody>
</table>

**Corridors with most significant increases in PM buffer time**

<table>
<thead>
<tr>
<th>Corridor location</th>
<th>Time of day</th>
<th>2013</th>
<th>2015</th>
<th>Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-5 SB</td>
<td>PM</td>
<td>3.7</td>
<td>6.7</td>
<td>+3.0</td>
<td>81.1%</td>
</tr>
<tr>
<td>I-205 NB</td>
<td>PM</td>
<td>4.4</td>
<td>6.2</td>
<td>+1.8</td>
<td>40.9%</td>
</tr>
<tr>
<td>US 26 WB</td>
<td>PM</td>
<td>2.0</td>
<td>5.4</td>
<td>+3.4</td>
<td>89.0%</td>
</tr>
</tbody>
</table>

**Corridors with largest increases in mid-day buffer time**

<table>
<thead>
<tr>
<th>Corridor location</th>
<th>Time of day</th>
<th>2013</th>
<th>2015</th>
<th>Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-5 SB</td>
<td>Mid-Day</td>
<td>10.0</td>
<td>14.5</td>
<td>+4.5</td>
<td>45.0%</td>
</tr>
<tr>
<td>I-205 SB</td>
<td>Mid-Day</td>
<td>4.0</td>
<td>8.1</td>
<td>+4.1</td>
<td>102.5%</td>
</tr>
<tr>
<td>US 26 EB</td>
<td>Mid-Day</td>
<td>3.7</td>
<td>7.0</td>
<td>+3.3</td>
<td>89.2%</td>
</tr>
</tbody>
</table>

*Selection based on buffer time weighted for length of corridor

Reliability on I-84 EB has shown a decrease in both average and buffer travel time during the PM peak. This is due to the auxiliary lane extension project constructed in 2014 at the I-84 EB exit ramp to I-205 NB.

**Corridor that experienced sustainable reliability**

<table>
<thead>
<tr>
<th>Corridor location</th>
<th>Time of day</th>
<th>2013</th>
<th>2015</th>
<th>Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR 217 SB</td>
<td>PM</td>
<td>7.6</td>
<td>8.1</td>
<td>+0.5</td>
<td>+6.6%</td>
</tr>
</tbody>
</table>

OR 217 SB PM travel time has decreased and the buffer time change is among the lowest in the region.

This is the result of the Active Traffic Management (ATM) project that was deployed in 2014. The purpose of the ATM is to manage the recurring congestion to improve the safety and reliability of the corridor.
**Interstate freight routes**

I-5 carries the highest freight volume, ranging from 13,600 to 17,800 trucks per day. It is the major north-south corridor for long-haul freight movement. In the northern corridor it serves Port of Portland marine facilities and Portland International Airport. In the southern corridor, it serves the Tualatin-Wilsonville industrial area.

I-205 carries the second highest freight volume ranging from 7,900 to 13,100 trucks per day. It also functions as a north-south corridor for long-haul freight movement. In the north corridor it serves the Portland International Airport and the Columbia Corridor industrial area. In the southern corridor, it serves the Oregon City and Clackamas industrial areas.

I-405 has freight volumes ranging from 5,900 to 10,000 trucks per day. It functions as an inter-urban freight route for the west side and the US 30 industrial areas.

I-84 has freight volumes ranging from 6,500 to 7,800 trucks per day. It is the only interstate for east-west freight movement in the state. It serves the Troutdale industrial area, Port of Cascade Lock and Port of Hood River.

**Freeway Freight Routes**

US 26 and OR 217 are the two freeways that provide freight access to the industrial areas in Washington County.

US 26 has freight volumes ranging from 1,500 to 6,000 trucks per day. It provides east-west freight connections from I-405 and I-5 to the North Hillsboro industrial area. Freight from high-tech industries in the Hillsboro area are low volume but high value commodities.

US 26 is restricted from hauling hazardous materials through the Vista Ridge Tunnel near I-405. Trucks carrying hazardous materials are required to use OR 217 or Cornelius Pass Road to US 30.

OR 217 provides a north-south freeway freight route connecting Washington County freight to US 26 and I-5. It has freight volume of about 4,300 trucks per day.
Freeway Congestion and Reliability Impacts on Freight

Data for the region’s six freeways show increasing congestion, decreasing travel speeds, greater delays and unreliable trip times. In 2013, 11.3 percent of freeway travel in the Portland metro region took place in congested conditions. This increased to 13.7 percent in 2015.

“Congestion and travel delay due to deficiencies in the transportation system are impacting businesses throughout the state, threatening their national and international competitiveness.” (Note: Economic Impacts of Congestion on the Portland Metro and Oregon Economy – Portland Business Alliance 2014)

Many business owners report that they have changed to staggered shifts, added evening and overnight operations, and increased operations during off-peak hours (Economic Impacts of Congestion on the Portland Metro and Oregon Economy). This results in increased labor expenses, as operators need to hire additional drivers to cover new shifts.
As congestion creeps into the mid-day, truckers find it challenging to deliver goods and services on time. The loss of reliability during the day makes it difficult for interstate travel and delivery of goods resulting in increases in trucking costs. Reliability has degraded on all six of the region’s freeways between 2013 and 2015.

**Figure 12: Corridor Length**

**I-5 Corridor** – I-5 truck volume accounts for 10 to 17 percent of total traffic and has the highest truck volumes in the Portland region. For both directions of I-5 in the AM peak, mid-day, and PM peak, both the average travel time and the buffer time increased. I-5 northbound and southbound during the PM peak experiences some of the most unreliable travel times in the region. I-5 southbound during the PM and I-5 northbound during the mid-day has one of the largest buffer travel time increases in the region.
**I-84 Corridor** – I-84 truck volume accounts for 5 to 20 percent of total traffic. It carries the fourth highest truck volumes in the Portland region providing long haul access for interstate east-west connections. Reliability on I-84 westbound has degraded between 2013 and 2015 for the AM peak, mid-day, and PM peak. Reliability on I-84 eastbound has shown a decrease in both average and buffer travel time during the PM peak. Buffer time reliability for I-84 eastbound in the AM peak and mid-day has remained the same.

**I-205 Corridor** – I-205 truck volume accounts for 6 to 9 percent of total traffic. It carries the second highest truck volumes in the Portland region, providing an alternative north-south interstate route to I-5 on the east side. For both directions of I-205 in the AM peak, mid-day, and PM peak, both the average travel time and the buffer time increased. I-205 northbound during the PM peak experiences some of the most unreliable travel times and largest buffer travel time increases in the region. I-205 northbound and southbound during the mid-day has some of the largest buffer travel time increases in the region.

**I-405 Corridor** – I-405 is an urban interstate connector, linking I-5, US 26 (Sunset Highway) US 26 (Ross Island Bridge) and US 30. I-405 truck volume accounts for 6 to 8 percent of total traffic. I-405 has the third highest truck volume in the Portland region. For both directions of I-405 in the AM peak, mid-day, and PM peak, both the average travel time and the buffer time increased. I-405 northbound and southbound during the PM peak is among the corridors with unreliable travel time and is also among the corridors with the largest buffer time increase in the region.

**US 26 Corridor** – US 26 is a primary east-west connector to I-5 from the west side. Hazardous material cargo is restricted on US 26 at the Vista Ridge Tunnel. US 26 truck volume accounts for approximately 4 percent of total traffic. US 26 provides east-west freight connections to I-405 and I-5 freight routes. For both directions of US 26 in the AM peak, mid-day, and PM peak, both the average travel time and the buffer time increased. US 26 eastbound during the PM peak is among the top corridors with unreliable travel time. Westbound PM travel experiences some of the most significant increases in mid-day buffer time.

**OR 217 Corridor** – Because of hazardous material restriction on US 26 at the Vista Ridge Tunnel, OR 217 is the west-side detour connection for trucks carrying this material between US 26 and I-5. OR 217 truck volume accounts for approximately 4 percent of total traffic. OR 217 southbound during the PM peak is among the worst for reliability not only for the corridor but also the region. However from 2013 to 2015, it had the lowest rate of change, whereas other freeway corridors in the region have degraded at a significantly higher rate. This is attributable to Automated Traffic Management (ATM) measures deployed in the corridor. Mid-day reliability on OR 217 southbound has degraded substantially with buffer times longer than the AM buffer time.

Overall, freight truck reliability on the Portland region’s major freeway and highway system has deteriorated rapidly since the last Regional Freight Plan in 2010.
Freight Highway Bottlenecks Project and delay areas (ODOT – March 2017)

Bottleneck identification is of national concern, as expressed in the 2012 Moving Ahead for Progress in the 21st Century Act (MAP-21) and carried into the Fixing America’s Surface Transportation (FAST) Act. MAP-21 specifically highlights the importance of identifying and addressing bottlenecks on the multimodal freight system. Studies of existing freight highway conditions in Oregon identified that congestion from bottlenecks is a major issue impairing Oregon’s economy with variations in travel time reliability and rising travel costs. The 2011 Oregon Freight Plan (OFP) incorporated a strategic implementation initiative 2.3, which directed the state to “identify and rank freight bottlenecks...in particular those located on the strategic system”. The Freight Highway Bottlenecks Project (FHBH) was initiated to identify locations on Oregon’s highway network that were experiencing significant freight truck delay, unreliability and increased transportation costs.

There are many elements associated with freight truck delay and unreliability, including roadway congestion, high collision areas, and geometric conditions such as steep grades, severe curves or roadways that are not up to functional standards. The FHBH looked at a variety of key measureable indicators to identify locations on the state freight highway network, specifically those routes identified at ORS 366.215 restriction review routes. Indicators were things such as:

- **Delay** – the hours of delay that trucks accumulate at each corridor per day during the season of the year that produces the largest delays for that segment.
- **Unreliability** – unreliability of shipment travel times that cannot be anticipated.
- **Geometric Issues** – % grade, degree curvature, narrow lanes or shoulders.
- **Volume** – Volume-to-capacity ratio and peak congested travel.
- **Incident-Related** – Frequency of various collision types.
- **Cost** – Transportation delay costs, inventory delay costs and unreliability costs.

Feedback and responses/contributions from freight stakeholders were essential for the successful identification and tiering of freight highway bottlenecks. A technical advisory committee (TAC), made up of local and regional freight practitioners, an OFAC representative, ODOT Motor Carrier Division representative, Oregon Trucking Associations and other stakeholders were convened to review data, assess indicators and review bottlenecks list.

Some considerations the stakeholder groups identified at various points in the project that were incorporated into the final list included:

- **Key Indicators** – All stakeholder groups indicated that they did not believe all the indicators were equal in terms of importance. The stakeholders collectively agreed that travel delay and unreliability were the two major indicators that should be focused on to trigger a bottleneck designation. The other indicators were used to help understand the cause of the delay area and tier the bottleneck areas.
- **Urban vs. Rural** – The analysis found that the freight network in urban areas often operated at a different scale than in the rural areas of the state. Therefore, different thresholds were considered in urban and rural conditions.

- **Corridors** – There were clear strings of delay areas, particularly in the Portland Metro area that should be considered as corridors rather than individual delay areas. This reflects the cumulative impact that longer segments have on freight movements. It also acknowledges the need to consider the entire corridor when developing solutions.

- **Tiering** – The costs associated with travel delay and unreliability was determined to be the key indicator to determine the bottleneck corridor and delay area severity.

The final tiered freight highway delay areas map is shown below. As shown, both freight delay areas and freight delay corridors are presented. The Portland Metro area has the bulk of the identified delay areas and corridors, even though the thresholds for rural areas are significantly lower than those in urban areas. Delay areas within corridors represent nearly all of the first two tiers reflecting the high cost of cumulative delay and reliability on the freight industry. The only tier one corridor is I-5 in the Portland metropolitan area because the impacts to freight in this corridor far exceed those in other locations throughout the state. The freight highway bottleneck list and map were endorsed by OFAC during their regular meeting on January 18, 2017.

**Figure 13:** Freight Highway Delay Areas

![Freight Highway Delay Areas](source: Freight Highway Bottlenecks Project, ODOT 2017)
Corridor Bottleneck Operations Study (ODOT)
The Corridor Bottleneck Operations Study (CBOS) is a 2013 study conducted by ODOT to identify low-cost and effective solutions to the recurring bottlenecks within the Portland Metro area. The resulting document was a Project Atlas that identified bottleneck locations along the five metro area corridors (I-5, I-205, I-84, I-405 and US 26) as well as a collection of low-cost, operational solutions to the various bottlenecks.

The development of the Project Atlas consisted of three primary steps:

1. **Corridor-level reconnaissance**
   This included preliminary surveying and research to provide a solid foundation for specific investigation in order to validate recurring bottleneck activity and primary causes.

2. **Bottleneck Analysis, evaluation, screening, and selection of solutions**
   This step was aimed at design and operation – during this step the bottlenecks were analyzed and potential solutions were developed, evaluated, and screened by a design panel consisting of professionals from an array of discipline areas. The projects proposed were primarily constrained by cost ($1 million to $20 million range) and the inability to add capacity. As a result, the benefits resulting from projects are likely to be moderate or incremental and be geared towards improving safety by limiting the amount of weaves and merges that occur at interchanges.

3. **Refinement of Solutions**
   The third and final step focused on more in depth evaluation of operation and design solutions. The evaluation included traffic modeling as well as an assessment of project feasibility.

**Study Area**
The study area in the CBOS consists of five corridors in the Portland metropolitan area (see Figure 14.) Note that the study area within these corridors includes the ramp merge and diverge locations in addition to the roadway mainline. Figure 14 (below) highlights the boundaries of the study area.
I-5: North Boundary – Marquam Bridge | South Boundary – Boones Bridge
I-205: North Boundary – Airport Way | South Boundary – I-5 interchange in Tualatin
I-84: West Boundary – I-5 | East Boundary – 257th Avenue
I-405: North Boundary – I-5 | South Boundary – I-5
US 26: West Boundary – OR 47 | East Boundary – I-405

Figure 14: The Study Area in the CBOS

Figure 15: Bottleneck Locations

Source: Corridor Bottleneck Operations Study, ODOT 2013
Findings
The conclusion of the study offered helpful information regarding the location, duration, and typical cause of each bottleneck. The study identified 36 recurring bottleneck locations distributed throughout the five corridors. Figure 15 highlights these bottleneck locations.

Economic Impacts of Congestion in Oregon (2014)
The final report for the study was prepared by the Economic Development Research Group in February 2014 for the Portland Business Alliance, Oregon Business Council and the Port of Portland. The following is a summary from the report of transportation's role in the state's economy, the transportation systems impact on business and the impact of congestion and travel delay on the Oregon economy.

Oregon's transportation system is the backbone of the state's economy. A well-maintained, resilient, and efficient network of highways, rail and waterborne transportation is essential to support the businesses that provide the jobs and revenues needed to underpin the resource-based, traditional manufacturing and advanced biotech and computer/electronics technologies that characterize the state's economy. The key findings are:

- Oregon's competitiveness is largely dependent on efficient transportation. Over 346,400 jobs are transportation-related, or transportation-dependent, meaning that system deficiencies threaten the state's economic vitality.
- Businesses are reporting that traffic congestion and travel delay costs money, forcing changes in business operations and location decisions.
- Oregon's geographic location makes it a key component of US West Coast logistics, serving as a major hub for domestic and international freight. The state provides key international air and maritime gateways as well as an important junction of critical transcontinental highways.
- “Traded industries” – those industries that provide goods and services outside of Oregon and bring money back into the state economy – are particularly reliant on an efficient transportation network. Exports from these industries are shipped through most major ports on the US West Coast. These industries are also critical to statewide economic growth and job creation.
- Congestion and travel delay due to deficiencies in the transportation system are already impacting businesses throughout the state, hurting their competitiveness. Direct interviews with businesses were conducted as part of this study and the results underscore the fact that transportation is critical to business competitiveness and sustained business growth in Oregon. Due to increasing congestion, businesses report that they are drastically altering operations in order to keep a competitive edge.
- Changes in business operations are nearing the limits of what a business can do to overcome transportation congestion before it becomes a severe issue. Many respondents reported that they have implemented staggered shifts, evening and overnight operations, and are increasingly operating during “off-off-peak” hours.
However, businesses do so per the boundaries of regulatory limits on hours, concern about driver safety and limits as to when they can feasibly deliver to customers.

- Failure to adequately invest in the transportation system will result in significant losses to Oregon's economy, job base and quality of life. Congestion is becoming an increasing problem statewide, and that investments in infrastructure can strongly mitigate these conditions.

- These travel time savings from new investments translate to significant economic impacts. With transportation investments in the “Improved Future Investment Scenario,” these savings would generate an additional 8,300 jobs by 2040; $928 million in output; $530 million in GDP or value added; and $380 million in wages and compensation to employees.

**Freight access and logistics**

**Portland Region Westside Freight Access and Logistics Analysis Report (DKS - October 2013)**

**Portland’s Dependence on High-TechExports**

Portland’s economy has long relied on export industries, serving broad domestic and international markets and bringing outside dollars into the region. Increasingly, Portland’s export economy relies on semiconductors and the computer and electronics (C&E) industry, which accounts for over half the total value of the region’s exports (Figure 16). This industry is primarily located in the region’s Westside (sometimes called the “Silicon Forest”) and depends on a tightly managed supply chain to efficiently bring products to markets that are mostly outside of the Portland Metropolitan area. This study provided recommendations on how to improve goods movement from the Westside C&E industry to Portland International Airport (PDX) freight consolidation locations.
While this study focused on a single sector of the region’s export economy, it is important to recognize that policies and investments that support the computer and electronics industry may support other key export industries such as footwear, apparel and agricultural products.

Continued growth in these other industries will tend to have ancillary benefits to the computer and electronics industry such as improving the frequency of Portland International air cargo service or increasing the range of freight movement options.

**Study Focus**
This study focused on the outbound movement of goods from Westside computer and electronics manufacturers to the freight consolidation area at Portland International Airport (PDX), as shown in Figure 17. While not all C&E goods fly out of PDX, the freight consolidation area, generally located north of Columbia Boulevard and south of the terminal, is home to several firms that support international and domestic service by handling and combining C&E goods before trucking them north or south of the Portland region for consolidation at other airports. For the purposes of the study, Westside C&E firms are assumed to be clustered south of US 26 in the vicinity of Brookwood Parkway.
Freight movement between the Westside C&E cluster and the PDX freight consolidation area depends on two routes: (1) US 26 to I-405 north to I-5 north, and (2) Cornelius Pass Road to US 30, then eastbound across the St. Johns Bridge to Columbia Boulevard. These key routes are the focus of this study. The study does not consider other corridors, such as OR 217 and I-5 south that are important to regional freight movement but are not regular routes for transporting freight from the Westside to PDX.

The study looked at projects that can have a significant impact on speed, efficiency and reliability that can be pursued in the near term.

**Study Findings**
Several important findings emerged from this study's industry interviews and technical analysis:

- Portland International Airport (PDX) is a crucial location along the supply chain, but most C&E freight moves out of PDX on a truck.
- Firms involved in freight movement and logistics currently use PDX as a freight consolidation hub, but they generally find it is most efficient to truck, rather than fly, goods to airports that have better links to overseas destinations.
- Supporting a strong Westside C&E cluster can help leverage freight movement options for other industries. While the Silicon Forest is dominant in the region’s export economy, other regional export industries such as footwear, apparel and agriculture can benefit from the short-term strategies identified in this report. All export industries in the region benefit from air cargo services out of PDX and these services can be maintained and/or increased by increased export activity.
Reliability of the roadway system is key to C&E goods movement. Interviews indicated that after 2:00 pm “all bets are off” regarding the reliability of the US 26/I-405/I-5 corridor and that Cornelius Pass Road/US 30 becomes the de facto route in the afternoon. Analysis of travel time data confirms that Cornelius Pass Road/US 30 is significantly more reliable in the midday and p.m. hours.

The Westside C&E industry is heavily dependent on a rural road with known deficiencies. Cornelius Pass Road from the Washington County line to US 30 was designed and built for rural use, but is increasingly used for urban-to-urban trips. Because it is a winding and steep road through a narrow pass, it is susceptible to incident-induced congestion (such as truck rollovers) and a lack of viable alternative routes.

Recommendations

Three strategies emerged from this study that show clear benefit to Westside C&E freight movement and can potentially be implemented in a short timeframe. These strategies are shown in Table 4.

Table 4: Recommended Priority Projects

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Description</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhanced Traveler Information</td>
<td>Provides predictive traveler information at key points on routes approaching US 26, alerting drivers to congestion on US 26, through the central city loop, or on Cornelius Pass Road northbound.</td>
<td>Provides more reliable travel time by alerting drivers of incidents, reducing non-recurring delay.</td>
</tr>
<tr>
<td>US 26 Truck Ramp Meter Bypass</td>
<td>Modify select US 26 on-ramps to allow freight to bypass ramp meter queues.</td>
<td>Potential to reduce queue-related delay by 10 to 20 minutes.</td>
</tr>
<tr>
<td>Enhanced Freeway Incident Response</td>
<td>Increase incident response and clearing capacity on key US 26/I-405/I-5 freight route to reduce non-recurring congestion impacts.</td>
<td>Reduces delays due to incidents.</td>
</tr>
</tbody>
</table>

Washington County Freight Study (July 2017)

Background

Washington County is the economic engine of the Portland Metro region and the state. The computer and electronics industry, which accounts for nearly half of state exports in terms of value, is centered on the western part of the Portland-metro region, primarily in Washington County. The county contains over 15 percent of the state’s jobs (second highest in the state) and has the highest average wages. Given the trade-dependent nature of many businesses in Washington County, it is important to understand how freight congestion impacts these companies’ ability to operate, compete, and grow.
Study Purpose and Scope
The Transportation Futures Study analyzed the future transportation needs of Washington County based on anticipated population and employment growth. It found that delays for trucks would be more than twice that for other vehicles. While that study outlined broad transportation needs for all users in the county, study partners determined that additional freight-specific data and analysis were needed to further identify and prioritize needs for trucks.

Previous studies have explored the dependence of traded sector jobs on the transportation system in the region. The purpose of this study was to identify and prioritize infrastructure problems within Washington County that impact freight. The results will inform the development of regional, state and federal funding requests and need for road improvements. They will also provide input regarding freight flows and market considerations (including cost sensitivity and urgency) to the future demand forecast for the Hillsboro Airport Master plan.

Under the guidance of the Steering Committee composed of project partners, the study:

- Reviewed existing plans, studies and data.
- Conducted interviews with companies that ship or carry goods into or out of Washington County.
- Analyzed recent truck operations using real-time speed and volume data.
- Evaluated and prioritized truck needs within Washington County.

Key Findings

- As the economic engine of Oregon and a major exporting region, Washington County is highly dependent on freight infrastructure.
- In addition to computers and related components, plastic, wood, paper, tools, nursery, seed, fruit and tree nut products all represent significant exports produced in Washington County.
- The Portland metropolitan area has the bulk of identified delay areas and corridors in the state according to the recently completed Freight Highway Bottleneck Project (FHBP).
- Due to its relative speed and flexibility, trucks are by far the most common mode. On their own, or in combination with other modes, trucks are a part of most freight trips.
- Businesses’ heavy reliance on trucks makes highway and arterial congestion a major concern for many firms in Washington County and the region. Congestion adds time to deliveries, resulting in significant costs to businesses. Most interviewed firms indicated that highway congestion was a serious impediment and complained of significant impacts from consistent, pervasive roadway congestion. A severe
national truck driver shortage, exacerbated by federal requirements and traffic delays, is impacting the ability of businesses to move goods.

- New real-time truck operations data on arterials was analyzed with truck counts in an analysis that allowed more detailed understanding of local delay and reliability issues critical to freight movement than previously.

- The limited number of routes into the county, the degree of delay and unreliability on them, and the importance of county freight to the economy make access to Washington County a statewide issue. These concerns were expressed by stakeholders and supported by the study evaluation and the statewide FHBP.

- The I-5 corridor was most often cited by stakeholders and represents the highest need in both this analysis and the statewide bottleneck study.

- The US 26 corridor near the Sylvan Tunnel followed I-5 in terms of stakeholder concerns and freight operational performance in this analysis and was also identified as a delay corridor in the statewide study.

- Many Washington County highways and arterials suffer from congestion throughout much of the day. Other key areas of freight operational delay and unreliability include portions of OR 217, OR 8, Tualatin-Sherwood Road, Cornelius Pass Road and Murray Boulevard.

- Farm to market roads near the edge of the urban area are not built for the volumes or loads they are subject to.

**Stakeholder Suggestions to Improve Freight Movement**

Stakeholders had a number of suggestions to improve freight movement, including the following general approaches:

- Adding HOV or truck-only lanes
- Providing incentives to encourage off-peak delivery
- Adding lanes or interchanges at bottleneck areas along specific corridors
- Expanding transit service, routes, and facilities along congested corridors
- Higher speed limits

Each of these tools offers its own set of opportunities and limitations. They might work in some locations or for some industries and not others. However, they should all be explored as part of a comprehensive approach to freight delay and reliability issues in the Portland metropolitan area.

**Conclusions**

This freight needs analysis was intended to provide information to decision makers in establishing transportation funding priorities. Freight delay and reliability within and to Washington County are a major regional issue. Due to the importance of county traded
sector businesses to the economy, the freight needs identified here rise to the level of statewide significance.

As summarized, this study identified and prioritized Washington County Freight needs. This study finds that freight access to, and movement within, Washington County represents a significant cost to businesses and drag on the economy. These findings demonstrate the location of significant freight needs in and around Washington County and underscore the importance of developing and funding road improvements to meet them.

Over-dimensional trucks

Highway Over-Dimensional Load Pinch Point Study (ODOT)

Purpose
The Highway Over-Dimension Load Pinch Point Study (HOLLP) was conducted by the ODOT Freight Planning Unit, Transportation Development Division, with the goal of identifying, analyzing and ranking interstate and state highway pinch points that restrict the movement of over-dimension loads. The study was completed in May 2016. The primary purpose of the study was to develop a list of key pinch points that can then be presented to the ODOT Region and Area Commission on Transportation for project recommendations that would remove these pinch points.

Definitions
An over-dimension load is a load classification that is triggered when a load has any of the following dimensions.

1. Width greater than 8 feet, 6 inches
2. Vehicle height or vehicle combination greater than 14 feet
3. Front overhang greater than 4 feet beyond front bumper
4. Load is greater than 40 feet and extends 5 feet beyond the end of the semi-trailer; or load less than or equal to 40 feet exceeds 1/3 of the wheelbase of the combination, whichever is less.
5. Vehicle combination length that exceeds those authorized on the reverse of MCTD Group Map 1.
6. Any single axle weight that exceeds 20,000 pounds, tandem axle weigh that exceeds 34,000 pounds, or gross combination weight that exceeds 80,000 pounds.

Most commonly over-dimension loads include cranes, excavators, steel plates, manufactured homes, forklifts, boats, transformers, windmill turbines, and other oversized industrial equipment.

The study highlights two primary route types that are relevant to over-dimension loads.

1. **High Routes** - these routes are designated as the routes required for the transport of over-dimensional loads requiring vertical clearance.
2. **Reduction Review Routes (RRR)** – are the highways associated with ORS 366.215 and OAR 731-012-0010. The statute states that Oregon Transportation Commission may not permanently reduce vehicle-carrying capacity of a RRR unless safety or access considerations require a reduction.

Bottlenecks or delay areas are commonly referred to as places or points where congestion frequently occurs. In relation to the study, over-dimension pinch points are those areas that become problematic due to width, length, and vertical clearance or weight constraints. For over-dimension loads these pinch points usually take the form of overpasses, narrow roadways, sharp curves, or weight-restricted bridges.

The HOLPP uses the same dimension categories to classify pinch points within the study. The three classifications offer useful information surrounding the nature of pinch points for over-dimension loads within the Oregon transportation network.

**Heavy Load (HL) Pinch Point**
- These are bridges along the highway which cannot support the weight of over-dimension loads. Note that the most current list of weight-restricted bridges provided by the ODOT Bridge Program shows that none of the weight-restricted bridges are graded to handle a weight greater than 60,000 pounds and as mentioned earlier, over-dimension weight loads are gross weights greater than 80,000 pounds which means that HL pinch points are all weight-restricted bridges.

**Vertical Clearance (VC) Pinch Point**
- These are classified as areas lacking the required vertical clearance for over-dimension transport. They are based on the vertical clearance design standards in the Oregon Highway Design Manual: 17’-4” on High Routes, 17’-0” on NHS Non-High Routes and 16’-0” on Non-NHS and Non-High Routes. As a safety buffer, the MCTD adds an additional 4” to the actual height of any bridge unit when routing trucks and will not route any truck that doesn’t meet the clearance with the buffer zone included.

**Wide and Long (WL) Pinch Point**
- These are points along the highway where it is difficult or impossible to move some over-dimension loads due to horizontal constraints. The study offers no dimensions for WL pinch points, however, ODOT Maintenance District staff has identified WL pinch points based on their experience and history of routing over-dimension loads on the highways within their districts. Commonly these points take the form of guard rails, narrow bridges, curbs, non-removable signs, intersections, and any other horizontal constraint.

**Findings**
The study resulted in a High Priority Pinch Point classification system that highlights the criteria for distinguishing locations as high or low priority for action.
ODOT’s High Priority Criteria:

- **WL Pinch Points** – In order to be classified as High Priority all WL pinch points within RRR segments must be separated by at least 15 miles (either direction). This helps direct focus on situations where removing a pinch point would open up a RRR to wider and longer loads. Additionally, all High Priority WL pinch points must be less than one mile in length.

- **VC Pinch Points** – In order to be classified as High Priority all VC pinch points must be at least 6” less than the design standard for that type of highway. Similar to WL pinch points all High Priority VC pinch points must separate from other VC pinch points on a RRR segment by at least 15 miles in order to focus on situations that would have greater impact if a single pinch point is removed.

- **HL Pinch Points** – At this point all HL pinch points are classified as High Priority because there are so few weight-restricted bridges on the RRR.

- **Combination Pinch Points** – These are pinch points that fall into multiple categories such as a WL/VC pinch point. In order to qualify as High Priority a combination pinch point is only required to meet the High Priority criteria for one of the pinch points.

Special circumstance can warrant a High Priority classification of a pinch point and must be documented. Any pinch point not meeting the criteria listed above are currently rated as Low Priority.

At this time 88 pinch points have been identified within the boundaries of the Portland region’s metropolitan planning area. Eighteen of these pinch points have been classified as High Priority. Eight of the High Priority pinch points are due to wide and long horizontal constraints, and an additional seven are constrained by vertical clearance (VC), one is due to a heavy load constraint and the remaining two are combination pinch points. The 70 other pinch points are currently rated as Low Priority with the vast majority (60 points) classified as VC areas.

Of the eighteen High Priority pinch points, six are located on I-5 with one at the Columbia River Bridge and the rest at various on and off-ramps. Four of these pinch points are located on I-405 at various on and off-ramps. The remaining eight pinch points are located throughout the region on the interstate and state highway system (I-205, I-84, US 26, OR 217, OR 99E, and OR 99W).

While the study does not specifically address how each pinch point should be technically modified it does offer helpful insight on best practices for categorizing and prioritizing the problem areas and a clear picture of where potential projects should take place.
The Portland Freight Master Plan and the Regional Freight Plan both identified the need to plan for the efficient movement of over-dimensional freight vehicles within and through the Portland Metro region. The City of Portland, ODOT, Metro, Clackamas, Multnomah and Washington Counties agreed to work together to prepare a Regional Over-Dimensional Truck Route Study for the three county metro region.

The purpose of this study was to provide local jurisdictions with a comprehensive assessment of over-dimensional truck movements to more effectively plan for their safe and efficient routing within and through the metro region. This project identified and mapped the most commonly used and preferred routes for the safe movement of over-dimensional vehicles and documented the minimum clearance requirements to accommodate over-sized loads. Physical and operational constraints and missing gaps in the over-dimensional freight network were defined and recommended capital transportation improvements and planning-level costs for removing identified constraints were developed.

An inventory and assessment of current transportation policies and over-dimensional permitting practices was conducted to identify potential policy changes and permitting efficiency improvements. The goal was to develop a seamless over-dimensional route system that transcends jurisdictional boundaries and to provide policy guidance for accommodating over-dimensional vehicles in state, regional and local transportation system plans and local street design guidelines.

The study was initiated in October 2015 and concluded in March 2017. The Project Management Team (PMT) consists of representatives from the partner agencies to provide project oversight and guidance. The project consultant conducted the technical planning and engineering analysis, cost considerations and final report preparation. The Stakeholder Advisory Committee (SAC) composed of representatives from the over-dimensional hauling industry, and provided strategic input on all work products from the user's perspective.
Findings
The definition of over-dimensional trucks is defined by ODOT statewide. ODOT Motor Carrier Division requires permits for truck size and loads meeting the following dimensions:

- Width exceeding 8 feet, 6 inches
- Height exceeding 14 feet
- Length exceeding 40 feet
- Gross Vehicle Weight exceeding 80,000 lbs.

Thirty-four Regional Over-Dimensional Truck Corridors were identified for this study (see Figure 18).
Figure 18: Regional Over-Dimensional Truck Corridors

REGIONAL OVER-DIMENSIONAL TRUCK CORRIDORS
FROM THE METRO REGIONAL OVER-DIMENSIONAL TRUCK STUDY

CORRIDORS BY JURISDICTION

WASHINGTON COUNTY

W11
W12

PORTLAND

P10

CLACKAMAS COUNTY

C1
C2
C3
C4
C5
C6
C7
C8

MULTNOMAH COUNTY

M1
M2
M3
M4
M5
M6

FREeway / Hwy

Highway 217
Pacific Highway

Murray Boulevard
SW 185th Ave
NE/NW Cornell Road
NW Cornelius Pass Road
SW Tongquin Road
NE Brookwood Pkwy
NW Evergreen Road
SW Scholls Ferry Road
Roy Rogers/Tualatin-Sherwood
Tualatin Valley Highway
Highway 217

Marine Drive
Lombard Street
Columbia Boulevard
US 30 Bypass
North Portland Road
Highway 99E/MLK
NE Airport Way
North Going Street
US 30/NW Front Ave
NE/SE 82nd Ave (OR 213)

Orient Drive
82nd Drive
Beavercreek Road
Arndt Road
SE Johnson Creek
Sunnybrook Boulevard
Highway 212

SW 257th - Kane - Palmquist
NE 207th/Bayfair Drive
Beavercreek Blvd
Sandy Blvd/US 30 Bypass
Marine Drive
Cornelius Pass Road
20,611 Single Trip Permit (STP) records issued by ODOT between 2012 and 2015 were evaluated to identify overall width, height, length, weight and commodity type moved.

- **Commodities Moved:** Excavators, cranes and log loaders account for 30% of all commodities.

- **High Loads:** 90% of all high loads were 15 feet or less. The highest load was a transformer at 18 feet, 2 inches moved between Happy Valley and Oregon City.

- **Wide Loads:** 35% of all wide loads were between 11-12 feet. Excavators accounted for 24% of wide loads between 11-12 feet. The widest load was a 25 foot steel skirt moved from Newberg to Portland.

- **Long Loads:** 60% of the loads were between 70-90 feet in length with excavators accounting for 15% of these movements. The longest load was a 225 foot heat exchanger moved from the Oregon/Washington border at I-205 to Hillsboro.

- **Heavy Loads:** 75% of all heavy loads were between 120,000-160,000 lbs., with excavators accounting for 20% of these movements. The heaviest load was a 662,212 lbs. transformer moved between Oregon City and Clackamas.

Recommended capital improvements for the City of Portland and the three counties, along with a more detailed summary of the study, are available in the “Key Freight Trends and Logistics Issues Report” (to be completed in 2018).

**Industrial land supply**

**Regional Industrial Site Readiness – 2017 Inventory Summary**

The Portland metropolitan region competes on a global scale to attract traded-sector jobs. A key factor in determining a business’s likelihood of settlement is adequate land to do so. Having a site inventory of varying sizes and locations within Portland’s Urban Growth Boundary plays a key role in facilitating potential economic opportunities that support a thriving region, new jobs, and increased wages.

The Regional Industrial Site Readiness Project is a report that examines the supply of large (25+ acre) industrial sites available to accommodate existing and future employers. The inventory considers industrial sites within the Portland metropolitan area Urban Growth Boundary (UGB) and select urban reserves. The objectives of the 2017 report include the following:

- Track the changes in inventory since the 2014 update
- Analyze the readiness for each site inventoried
- Inform policy makers about policy changes and investments that have influenced the development-readiness;
• Summarize investments, tax base, and jobs created from development of inventory sites; and
• Identify policy and investment actions that can ensure a consistent inventory of these vital sites into the future.

The report also introduces a tier system that assists in better prioritization of various development sites. Tier 1 sites are considered recruitment ready for businesses expanding or locating in the region. Tier 2 sites will take longer to become development ready, but could be feasible for expansions of existing businesses and for speculative development for investors. Tier 3 sites meet the size and location requirements of the study but require complex fixed to become development-ready.

**Tier 1:** Development ready within 180 days. It is anticipated that a site could receive all necessary permits and sites could be served with infrastructure and zoned and annexed into the city within this timeframe. No or minimal infrastructure or brownfield remediation is necessary and that due diligence and entitlements could be provided and/or obtained within this time period.

**Tier 2:** Likely to require 7-30 months to become development ready.

**Tier 3:** Likely to require over 30 months to become development ready

**2014 – 2017 Inventory Changes**

Since the last update to the report in 2014, the inventory of sites has decreased from 54 to 47. This change was primarily driven by a strong economic cycle which we continue to see today. Additionally, 6 new sites were added to the inventory since 2014 (1 Tier 1, and 5 Tier 3) and 13 sites were removed mostly as a result of site readiness investment and development.

The charts below compare the changes in inventory by tiers and acreage for 2011, 2014, and 2017.

**Table 5:** Changes in inventory by tiers and acreage for 2011, 2014 and 2017

Source: Regional Industrial Site Readiness Project, Metro 2017
Findings

- Between 2014 and 2017, there has been significant development of large industrial sites in the region. There are relatively few unencumbered Tier 1 industrial sites remaining in the inventory and no 50+ or 100+ acre Tier 1 sites.

- There has been slower movement between tiers than in the previous inventory update (4 sites between 2014 and 2017, versus 7 sites between 2011 and 2014). This is in part due to the market absorption of sites, but underscores the continued need to make these site readiness investments.

- Significant challenges remain to move sites to market. This is particularly true for sites that require aggregation and High-Need Tier 3 sites.

- Site readiness investments and development since 2011 have resulted in significant investment and job creation.

Recommendations
The Portland metropolitan region continues to see a demand for larger industrial sites ranging from 50 to 100+ acres. The 2017 inventory shows that there is a deficiency of Tier 1 sites of this size, and the challenges of moving Tier 2 and Tier 3 to market readiness. An inability to meet this need will lead to lost opportunities for the region.

The report recommends policymakers consider policy action and investments to address industrial site readiness challenges and development hurdles. The report divides recommendations into Regional, Local, and State actions.

Local and Regional Site Readiness Actions

1. Engage the Oregon Economic Development Department, Oregon Economic Development Association, local jurisdictions, private property owners and developers in efforts to make investments in industrial sites needed to move these sites to market.

2. Actively work to find ways to aggregate 13 industrial sites with multiple property owners to realize the market potential of these sites. This is critical to realizing the potential of Coffee Creek, Meek Subarea and other industrial sites in the region.

3. Support local jurisdictions in evaluating the sites that require state and local legislative actions (e.g., annexation, zoning, and concept planning) and identify the timeline for and feasibility of completing this work. Metro has invested Community Planning and Development funds in the past to support such efforts.

4. Evaluate Tier 3 High-Need sites to determine if there is a path for development. If not, consider removing them from the inventory or creating a Tier 4.

5. Proactively work on solutions to the Lower Willamette cleanup to remove the cloud over the properties in the Portland Harbor.

6. Apply brownfield tools approved by the legislature to brownfield redevelopment of industrial lands (Brownfield Tax Abatement Program and Land Banking Authority).
7. Actively work on regional and local infrastructure financing solutions that impact 60% of the industrial sites in the inventory. Metro's Economic Atlas may help identify strategic infrastructure investments benefitting the region's industrial and employment lands. Local infrastructure needs could potentially be packaged with State infrastructure financing to fund local/regional projects through the West Coast Infrastructure Exchange.

8. Support regular updates of the inventory and track investments from sites that have been developed. Consider expanding the inventory to sites of 15 acres or more to reflect shifting market demand.

State Legislative Actions
9. Advocate for new tools and funding to support brown-field cleanup and redevelopment. This includes but is not limited to re-capitalization of the Oregon Economic Development Department's Brownfield Revolving Loan Fund and passage of Brownfield Tax Credit.

10. Support state loan funding for the Industrial Site Readiness Program and Special Public Works Fund. The Industrial Site Readiness Program was enacted in 2013 without authorization for loan funding. The Special Public Work Program is oversubscribed and underfunded.

11. Continue to support the Regional Solutions Teams that provide coordinated state attention to facilitate solutions for sites with complex issues involving multiple agencies. The Metro Regional Solutions Team played a key role in addressing site readiness issues in Troutdale, Gresham, Clackamas, and Hillsboro in the 2014-17 inventory cycle.

Local Development Actions
12. Evaluate the potential for new or expanded enterprise zones or other local or state incentives to help secure targeted development.

13. Encourage local communities to explore an expedited permitting process to address market expectations of issuing construction permits. Several communities with development wins in the 2014-2017 inventory cycle have expedited permitting programs in place (e.g., Hillsboro, Gresham).
Figure 19: Regional Industrial Site Readiness - Map of Tier 1, 2 and 3 Sites in 2017
CHAPTER 5

FREIGHT GENERATION IN THE REGION

5.1 Manufacturing, warehousing and distribution

The Portland metro region is home to a number of traded sector firms engaged in a broad array of activities. These firms bring wealth from outside the local economy into the region, helping communities to prosper. All of these enterprises have unique goods movement needs, some local, others national or international.

Unlike many areas of the country which have witnessed a substantial decline in manufacturing/industrial employment, the region has experienced some fluctuations, but overall growth in the trade-related sector of the economy over the last 15 years. This has created a need to efficiently deliver the materials needed for production (domestically and internationally) and to cost effectively ship finished products. Manufacturers in the region assemble products from components delivered from around the globe and ship components for assembly internationally. The mobility needed to support commerce in the region is as diverse as the commerce itself.

Manufacturers and shippers from throughout Oregon and Southwest Washington depend on the Portland metro region’s warehousing, distribution, logistics, customs and multimodal goods movement infrastructure to move raw materials, semi-finished and finished products. In the summer of 2017, there were more than 92,000 jobs in the Transportation, Warehousing, and Wholesale Trade within the 7-county, Portland-Vancouver-Hillsboro Metropolitan Statistical Area (MSA). In the trade-related sector (includes manufacturing, wholesale, retail, transportation and warehousing), the total in 2017 rises to about 337,000 jobs within the same MSA.14

These activities are spread throughout the region, with concentrations in Rivergate, the Columbia Corridor, Sunset Corridor, Swan Island, Clackamas-Milwaukee, Springwater-Damascus, inner Eastside, North Wilsonville-Tualatin-Sherwood, Beaverton-Tigard, Beavercreek and Northwest Portland industrial areas.

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14 Current Employment Statistics (CES) Nonfarm data
5.2 Intermodal facilities

In 2016 the ports of Portland and Vancouver hosted nearly 1,000 ocean going ships. The Port of Portland alone hosted 678 ships that year. These vessels transported 12.7 million metric tons of cargo to and from public and private facilities located in the Portland-Vancouver Harbor. Another 6.1 million tons of inland barge cargo also moved through these facilities. In total, $14 billion in foreign trade moved through Portland Harbor in 2016. Much of this cargo is transported beyond the Portland metropolitan area through key truck and rail corridors.

In addition, the Port of Portland operates the largest international airport in Oregon. It is the hub for the vast majority of air freight activity in the Portland metro region, western Oregon and Southwest Washington. Approximately 231,298 tons of domestic and international air freight shipped through Portland International during 2016.

5.3 Regional Goods Movement

Highway and roads

Trucks will remain the predominant mode of freight transport for the foreseeable future, due to their flexibility, speed, adaptability and availability. And though more than 90 percent of total regional truck trips begin and/or end within our region, as much as 52 percent of the total truck traffic entering the region via the interstate system is through traffic.\textsuperscript{15} This reflects the importance of our stewardship role for maintaining the throughput efficiency

\textsuperscript{15} Figures obtained from 4,159 roadside intercept surveys reported as Task 10, Portland Freight Data Collection Phase II, and Final Summary Report (March 2007) prepared for the Portland Freight Data Collection Team.
of the interstate freeway system for national freight movement but also provides a basis for requesting national assistance.

Measured by value, 74% of the commodities traveling in the Portland-region moved by truck, and about 14% of the commodities moved by rail.\textsuperscript{16}

**Figure 20: Commodity Flows by Mode**

Maintaining access to, and adequate capacity on, designated freight corridors and the National Highway System (NHS) within the region will remain critical to efficient goods movement. Performance of NHS roads within the region varies, but there are locations with regularly recurring chokepoints. It is not unusual for these chokepoint locations to experience frequent failures, particularly during peak weekday travel times, greatly reducing overall system efficiency and reliability.

\textsuperscript{16} Port of Portland Commodity Flow Forecast, March 2015, using 2007 FAF3 data
Class 1 rail lines operating in the Portland metropolitan area (BNSF Railway and Union Pacific Railroad) have been capacity constrained due to several long standing and well documented historical factors. These constraints will worsen as freight volumes at the region’s ports and intermodal facilities increase. Capacity chokepoints for the Class 1 railroads in the Portland metropolitan area have primarily centered on the Portland Triangle located in the industrial/port areas of North Portland and Southwest Vancouver.

Issues in the Portland Triangle area include inadequate siding lengths (Class 1 railroads are now fielding up to 8,000 foot long unit trains), rail bridges with inadequate capacity and lowered sufficiency ratings, at-grade rail crossings, sidings and mainline track sections that are over capacity. Other Class 1 capacity constraints within the region include switch control at the Steel Bridge and inadequate rail and intermodal yard capacity for current and future needs. Outside the region, railcar clearances and increasing weights will need to be addressed as the Class 1 railroads look to longer trains and heavier carloads to increase their operating efficiency and revenues.

Short line rail operators have taken over many of the local and regional rail functions formerly performed by the Class 1 railroads. Rail car weights are a critical issue for short line railroads. The Class 1 railroads are now considering rail car weights above 286,000 pounds, which will exceed the carrying capacity of many short line tracks in the region. Assisting regional short line railroads with track upgrades could reduce the risk of derailments, a potential public safety issue and certainly a productivity issue for the railroads. It also keeps trucks off the road. The short lines are also having to make-up more trains in their yards, which have limited capacity, before delivering them to the Class 1 rail yards. Assisting short line railroads requires government to show a clear public benefit, since these facilities are privately owned and operated.

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17 Railroads are classified according to their revenue; following decades of decline and mergers, there are now seven Class 1 railroads—constituting largest companies—currently operating in the United States. Class II railroads are also known as regional railroads; Class III includes the short line railroads.
Government and the railroads have historically cooperated to implement rail crossing safety improvements. The Class 1 and short line railroads have multiple at-grade crossings of their lines in the region, limiting train speeds and increasing the risk of conflicts between trains, vehicles, pedestrians and bicycles. Improving, eliminating, or grade separating at-grade crossings improves safety as the number and size of trains increase. Crossing improvements increase rail and road system productivity by helping longer trains clear crossings more quickly. Crossing improvements are the first step in applying for quiet zone status with the Federal Railroad Administration.

**Air Cargo**

Combined air cargo providers generally operate on a hub-and-spoke system, where freight is picked up at airports throughout the country in the early evening, flown back to a central destination to be sorted and then reloaded and flown to its final destination in the early hours of the morning for next day delivery. In order for this system to work, schedules must be maintained. This generally places air freight carriers' trucks on the road during evening peak hour traffic.

While traffic flows on the roadways immediately adjacent to Portland International have improved within the last decade, trucks carrying air freight to the airport during the evening peak hour face increasing congestion on several area highways leading to the airport. I-205, I-84, I-5, I-405 and US 26 all serve locations generating air freight cargo but have failing evening peak hour level of service.

Several traded sector manufacturers within the region are heavy users of air freight. Frequent roadway congestion forces many of these users to move shipping deadlines up, causing firms to lose valuable production time and increasing their production costs. Many shippers in the region were disappointed when direct air freight connections to Asia were lost in 2013 when Asiana Airlines stopped providing cargo service from Portland to Seoul, Korea. Some shippers need to truck their shipments to Sea-Tac or San Francisco International Airports to make their desired connections.

New air cargo service was restored in November 2016, when Cathay Pacific Airlines began to provide twice-weekly service to Portland as part of a route that begins and ends in Hong Kong. Air cargo service is more expensive and generally reserved for high value, time sensitive and perishable goods. 18 In 2015, air freight carriers moved 228,428 tons of cargo

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18 The Oregonian/OregonLive, July 14, 2016
through Portland International Airport. East Asia markets accounted for just over half of Oregon air exports.\textsuperscript{19}

In May 2009, Portland International Airport began to implement a project to extend its north runway, as well as a complete overhaul of its south runway. The south runway rehabilitation was completed in 2011. The north runway extension added 1,825 feet to the runway and was completed in 2013 (Port of Portland website – April 8, 2013) With these improvements runway and taxiway capacity at the airport should be adequate to meet the needs of air freight carriers through the next decade, based on recent statements by the Port of Portland.

**Marine**

Modern commercial navigation of the Columbia River began in 1877 when Congress approved dredging a navigation channel between the Portland-Vancouver area and the mouth of the river in Astoria. Currently, almost 1,000 ocean-going vessels call on the Portland-Vancouver Harbor each year. Navigation channel depth on the Columbia River continues to be the limiting factor on the size, and therefore the number, of ships that call on the Portland-Vancouver Harbor. Channel deepening has been pursued for several decades balanced by the need to protect various fish stocks migrating on the river.

The ports of Portland and Vancouver, as well as the other ports located along the lower Columbia River lead the nation in the shipment of grain. They also ship large quantities of other bulk agricultural commodities from Oregon, Idaho and Washington to the rest of the world. The region’s ports will still manage to grow by moving a wide range of marine cargoes, such as energy and transportation project related materials, manufactured goods, automobiles, agricultural and mining related products and fuel. The deepening of the Columbia River navigation channel to 43 feet has enabled more cargo to flow into the ports of Portland and Vancouver. While still only able to accommodate small to medium-sized container vessels, the new channel depth is not a limit for other cargoes such as autos and bulk cargo. Since completion of the channel deepening in 2010, freight facilities along the channel have completed over $1 billion in investments in new and expanded facilities.

The ports generate significant volumes of truck and rail traffic in the West Vancouver and Rivergate areas. Congestion during peak commute hours adversely impacts these truck movements. Intermittent congestion also impacts the Class 1 and short line railroads serving the area.

**Loss of container service at Terminal 6**

Marine container service is critical to Oregon and regional shippers. Terminal 6 has served a geographic and community market in Oregon, Idaho and SW Washington. In 2014, Terminal 6 captured 53 percent of the Oregon exports and imports market, with the remaining cargo moving through Puget Sound ports by rail or truck.

\textsuperscript{19} Port of Portland
The Port of Portland’s Terminal 6 lost container service in 2015. Since that time, there has been a great deal of volatility among container carriers, and a change in the operating structure at the terminal. To respond to the changing dynamics, the Port hired a national consultant team and engaged an industry leader committee to determine the Port’s future role in container shipping. This assessment should be complete by early 2018.

Terminal 6 has always been a multi-use facility that can handle oversized project cargo and containers with an on-dock intermodal yard. The terminal is also home to the Port’s successful auto business which includes Ford exports and Hyundai and Honda imports. Large project cargo, such as steel slabs, has previously moved through the terminal. Port of Portland is looking at short term ways to help support the industry get goods to market.

On March 31, 2017 the Port of Portland and ICTSI Oregon terminated their lease agreement at Terminal 6. The Port of Portland is working on a new plan to develop and manage carrier service for Oregon and Pacific Northwest shippers.

Even absent container activity (as is the case today) there is still cargo activity (and related rail and truck traffic) at the terminal. During the life of the RTP we would expect the volume of that activity and the related truck and rail movements to increase.

**Pipelines and pipeline terminals**

The Olympic Pipe Line Company, operated by BP Pipelines – North America is a 400-mile interstate pipeline system. The pipeline runs from Blaine Washington to northwest Portland. The system transports gasoline, diesel, and jet fuel. The Olympic Pipe Line transports about 65 percent of the petroleum products that Oregon uses. The pipeline provides approximately 1.9 billion gallons per year to Oregon.

Regional distribution occurs from the tank farm through a Chevron owned pipeline to Portland International Airport and through the Kinder-Morgan pipelines to users and distributors throughout the region. Maintaining good quality access to the tank farm facility is critical, particularly in light of a recent at-grade rail crossing closure on an access road to the tank farm.

The Williams Northwest Pipeline transports natural gas products to northwestern Oregon and Southwest Washington. Northwest Natural Gas operates a private natural gas network that connects to the Williams Northwest Pipeline and radiates through and beyond the Portland metro region. This pipeline network delivers gas directly to end users within and beyond the Portland metropolitan area.
River/ Barges

As a critical west coast hub, Portland area must maintain well-functioning river ports.

The Columbia Snake River system is a vital transportation link for the states of Idaho, Oregon and Washington. The economies of these three states rely heavily on the trade and commerce that flows up and down one of the most important commercial waterways in the Northwest. River transport of bulk commodities, like wheat, is the most efficient way to move product to and from the ports. In 2014, Oregon exported $209 million worth of wheat, making it the second most valuable commodity export in the state. Approximately 85% of Oregon wheat is exported, largely to Pacific Rim countries.

In addition to wheat, petroleum products, mineral bulks and many more commodities are exported through this trade gateway. More than 4 million tons of petroleum products are received at terminals in Portland each year and approximately half of that volume is barged upriver to inland ports. Oregon is also the top mineral bulk exporter on the west coast and shipped over 5.7 million tons of mineral bulks out of the Port of Portland in 2014.

The Willamette River also carries freight to and from Swan Island. On the Columbia Snake River system, the deep draft channel is 43 feet deep and runs from Astoria to the marine port facilities in Portland (105 miles). In 2016, over 50 million tons of international trade was carried in the deep draft channel. It also carried at least 24 billion dollars in cargo value.

The inland navigation channel runs from Portland/Vancouver to Lewiston, Idaho (360 miles) and is 14 feet deep. In 2014, barges carried over 9 million tons of commercial cargo
on the inland navigation channel. This part of the river represents an important gateway for Northwest wheat and forest products.20

Barge operators on the Columbia/Snake River system use equipment specifically constructed to operate in the locks on those rivers, adding significantly to their capital costs. It should be noted, however, that most import and export shippers prefer to use truck and rail for any higher value products moving through the ports.

The primary limiting factors to barge movement in the region are the BNSF rail and I-5 bridges crossing the Columbia River and the maintenance of navigable locks on the Columbia and Snake rivers.

5.4 Goods Movement and Land Use

While the success of the region’s economy is directly tied to its ability to efficiently move freight, it is true that freight movement and operations can potentially produce adverse impacts on local communities in the form of:

- increased emissions, noise and vibration, lighting and safety concerns
- impacts to land uses, community access and bicycle and pedestrian movements
- competition for highway and parking capacity
- impediments to visual quality and redevelopment efforts

These concerns are likely to increase over time as freight volumes increase. Many of the typical complaints voiced regarding truck and rail operations could be minimized or avoided with thoughtful and appropriate land use planning, which, like a good fence, makes better neighbors. It is important to note that these types of impacts are not the exclusive domain of freight operations – highways, transit and other transportation systems and services, even hospitals and schools – can engender comparable concerns over impacts to nearby residents.

On the other side, freight carriers and shippers can themselves be impacted when communities seek to restrict access by trucks on certain streets, limit night-time operations, reduce the number of truck loading zones, increase water recreation activities and public access within working waterfront areas, or when communities seek to use a freight railroad’s track for passenger rail service. As shippers’ supply chain logistics continue to evolve, the definition of “state of the art” warehousing and distribution centers changes as well. Larger, increasingly truck-based facilities are becoming the new standard.

Certain key regional intermodal rail to truck transfer facilities are quickly reaching their capacity and are constrained by the physical dimensions of their facilities. A regional discussion regarding retaining or restoring rail access into industrial areas should occur

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among the warehousing, manufacturing and distribution sectors, local governments and the short line rail operators.

There has been a demand at times for the conversion of industrial property to mixed-use residential. This is often incompatible with surrounding industrial operations and freight movement. Appropriate models of residential and commercial development should be planned for truck and rail corridors and areas adjacent to industrial sanctuaries to preserve the effectiveness of truck and rail corridors for industrial and freight use. From the viewpoint of freight carriers and shippers, allowing new incompatible land uses into industrial areas impedes business operations and access, resulting in higher operating costs, reduced safety and efficiency.

There is often fierce competition for land, a finite resource. Citing, protecting and redeveloping industrial areas for industrial uses is in keeping with the goal of creating and preserving industrial sanctuaries in the 2040 Growth Concept, but managing and balancing competing land uses will continue to be difficult as the region grows. Maintaining reliable multimodal transport options to our industrial areas is critical, particularly truck and rail connections. Providing rail service is becoming particularly difficult as rail operating practices continue to change rapidly.
CHAPTER 6
TECHNOLOGY FOR SUSTAINABLE FREIGHT TRANSPORT

6.1 Innovation and technology in freight transportation

Vehicle-to Infrastructure (V2I) is the next generation of Intelligent Transportation Systems (ITS). V2I technologies capture vehicle-generated traffic data, wirelessly providing information such as advisories from the infrastructure to the vehicles that inform the driver of safety, mobility or environmental-related conditions. The State of Oregon and local agencies are likely to install V2I infrastructure alongside or integrated with existing ITS equipment. The majority of V2I deployments may qualify for similar federal aid programs as ITS deployments, if the deploying agency meets certain eligibility requirements. Deploying V2I technologies in freight trucks and the region's roadway infrastructure will be of key importance for improving freight mobility, reliability and safety.21

The following definitions of V2I communications deployment help the region better understand how useful different application of connected vehicle (CV) technology will be in improving commodity movement within the next five years (short term):

- **V2I Safety (V2I):** Safety applications that help truck drivers anticipate and respond to potentially unsafe conditions to help avoid incidents and delays.
  - **Curve Speed Warning (CSW):** Alerts drivers who are approaching curves at speeds higher than the posted advisory speed.
  - **Spot Weather Impact Warning (SWIW):** Warns drivers of local hazardous weather conditions by relaying management center and other weather data to roadside equipment which then re-broadcasts to nearby vehicles.
  - **Reduced Speed/Work Zone Warning (RSWZ):** Utilizes roadside equipment to broadcast alerts to drivers warning them to reduce speed, change lanes, or come to a stop within work zones.

- **Agency Data:** Applications that focus on communicating agency data to connected vehicles (CVs) or using CVs to collect data that agencies can use to plan and manage the transportation system.
  - **Freight Networks:** Transmits freight network routes and information (speed limit, capacity, etc.) to truck drivers.
  - **Work Zone Traveler Information:** Monitors and aggregates work zone traffic data for transmission back to truck drivers.

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21 USDOT – Intelligent Transportation Systems- Vehicle to Infrastructure (V2I) Deployment Guidance
- **Probe-enabled Traffic (Freight) Monitoring**: Utilizes communication technology to transmit real-time traffic data between vehicles and to agencies via roadside equipment.

- **Road Weather**: Applications that help truck drivers anticipate and respond to severe weather conditions and events.
  - **Motorist Advisories and Warnings (MAW)**: Uses road-weather data from connected vehicles to provide information to travelers on deteriorating road and weather conditions on specific roadway segments.
  - **Weather Response Traffic Information (WRTINFO)**: Uses connected vehicle data and communications systems to enhance the operation of variable speed limit systems and improve work zone safety during severe weather events.

- **Mobility**: Applications that enhance mobility, increase efficiency, and reduce delay of freight vehicle travel.
  - **Freight Signal Priority (FSP)**: Provides signal priority to freight vehicles along designated freight corridors.
  - **Dynamic Freight Routing**: Determines the most efficient route, in terms of avoiding congestion or minimizing travel time or emissions for freight vehicles, and transmits this information to truck drivers.

- **Smart Roadside**: A set of applications to be deployed at strategic points along commercial vehicle routes to improve safety, mobility, and efficiency of truck movement and operations on the roadway.
  - **Wireless Inspection**: Utilizes roadside sensors to transmit identification, hours of service, and sensor data directly from trucks to carriers and government agencies.
  - **Smart Truck Parking**: Provides information such as hours of service constraints, location and supply of parking, travel conditions, and loading/unloading scheduling to allow commercial drivers to make advanced route planning decisions.\(^{22}\)

In the long term (more than five years), the region, state and local agencies will need to acknowledge, monitor, study and plan for the impacts of driverless vehicles, changes in the demand for distribution centers, and the decline in retail stores due to on-line ordering of goods and services.

### 6.2 Going green

There are at least two variables that every commercial carrier must come to grips with: fuel cost and fuel use. The former frequently dictates the lengths to which a carrier will go

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\(^{22}\) FHWA ITS Joint Program Office website
to conserve fuel, while the later directly impacts the production of greenhouse gases and particulate matter 2.5 emissions\textsuperscript{23}. The goods movement industry is responding to the prospect of sustained higher fuel costs and tightening emissions standards. Tools being used to improve power-train operating efficiency and reduce stationary idling of truck diesel engines include:

- clean diesel technologies, more efficient power-trains and improved aerodynamics
- low sulfur and bio-diesel fuels
- on board auxiliary power units
- parking area power and HVAC hook-ups for trucks
- ongoing and innovative operational changes that reduce the carbon footprint of freight

Every operator of commercial vehicles, be they aircraft, marine, rail or truck, has grown increasingly sophisticated at load, route, operator and vehicle optimization in an effort to minimize equipment downtime and maximize profit. Recent increases in the cost of fuel have only intensified efforts to increase operational efficiencies.

Oregon’s Clean Diesel Initiative and other efforts to promote clean diesel have translated into benefits for Oregon’s freight-oriented businesses. Older diesel engines are less efficient and pollute more than newer engines. They use more fuel and require more maintenance. However, upfront costs of replacement are a financial burden for businesses.

The Clean Diesel Initiative provides funds to local businesses in the form of matched dollars, grants and low interest loans to initiate retrofits or diesel engine replacements. This initiative has had the benefits of cleaner air and supporting a stronger economy.

A federal lawsuit settlement requires Volkswagen (VW) to pay $2.9 billion to a trust fund to be distributed to states, the District of Columbia and Puerto Rico. The initial allocation to the State of Oregon, based on registration share of Volkswagen diesels by state, is approximately $72.9 million. The funds are to be used over a 10 year period to support a defined list of projects intended to offset the excess air pollution created by Volkswagen’s cars.

Oregon’s SB 1008 provided authority and initial direction to the Department of Environmental Quality (DEQ) to replace or retrofit at least 450 school buses. Other VW fund eligible mitigation actions depend on further actions in future legislative sessions. When these priorities are identified and authorized, the Mitigation Plan will be amended.

The estimated number of older diesel buses still in the fleet by 2025, without the funds, total 450. This is the state’s target year to eliminate polluting diesel school buses. Over the

\textsuperscript{23} Particulate matter smaller than 2.5 microns have been shown to affect human health.
next four years, DEQ will offer funding to school districts to scrap/replace or retrofit exhaust controls until the target of 450 buses is reached.24

The public sector needs to complement these efforts by optimizing its own facilities and strategies to gain maximum throughput capacity and efficiency where it matters most. This effort needs to include multi-jurisdictional coordination and ongoing participation from the private sector goods movement community. The challenge of increasing the capacity of the goods movement system while remaining environmentally sustainable will require close coordination and cooperation between the private and public sectors.

6.3 Transportation system management

Several tools are available for transportation system management on the corridor level. These tools include variable message signs, traveler information systems, incident management and response, traffic signal progression, ramp metering and demand (traffic volume) responsive signal timing. Truck signal priority might also be considered in certain situations.

The public sector would benefit by managing its roadway infrastructure with the understanding that roadway capacity is valuable and costly to expand. For example, managing roadway performance through congestion pricing can include electronically charging road users a fee for using a road that might vary depending on changing real time demand for roadway capacity throughout the day with higher prices charged at periods of peak travel demand. Market-based road user fees, if properly implemented, can free up scarce road capacity for both passenger and freight needs, and provide revenue for alternative transportation and/or improvements to existing facilities.

Weigh-in-motion scales have been in use for many years, allowing trucks to bypass conventional truck scales, saving time, fuel and wear. Weigh-in-motion systems could be improved through the use of a single common transponder system for commercial vehicles operating throughout several western states.

Some industrial areas within the Portland metro region have freed up roadway capacity by forming transportation management associations. These associations can facilitate and promote enhanced pedestrian, transit, carpooling and bicycle alternatives to the daily commute. These associations also work with employees to tailor transit services to their work shifts and with employers to facilitate staggered shifts, compressed work weeks and work-from-home programs. These efforts can reduce single occupant vehicle travel within industrial areas during critical peak travel times.

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24 DEQ Fact Sheet on Oregon’s Initial Use for the Mitigation Fund
CHAPTER 7
FUNDING FREIGHT TRANSPORTATION NEEDS AND PRIORITIES

7.1 The transportation funding challenge

HB 2017 provides new state transportation resources

HB 2017-10, known as Keep Oregon Moving, was passed by the Oregon Legislature in 2017 and is the largest transportation investment in Oregon’s history. It will generate $5.3 billion in total revenue over ten years that will fund various types of transportation projects around the state. About half the funds will be distributed to local governments to fund local road and street maintenance and improvements, while the rest will be provided to the State Highway Fund to fund different types of projects around the state. For freight this includes:

- Bridges and highways – The majority of the State Highway Funds will go towards repairs and upgrades to bridges and highways to make them safer and more resilient to a major earthquake.
- Connect Oregon program – Connect Oregon will receive funding for multimodal projects, including rail, marine, aviation, and bicycle/pedestrian projects. Two specific projects are included in Keep Oregon Moving to help move freight from trucks to trains which will decrease freight congestion on highways. However, neither project is located in the Portland region.
- ODOT’s State Transportation Improvement Program (STIP)

Portland Region Projects

A portion of ODOT's funding is dedicated to specific projects around the state, with several in the Portland metro region. These projects will primarily address congestion and travel reliability of both passenger and freight vehicles. A description of the projects and their cost estimates are listed below:

- I-5 Rose Quarter ($30 million per year) – I-5 through the Rose Quarter has been identified as one of the most congested bottlenecks in the country. $30 million per year will be taken from the top of the State Highway Fund to add an auxiliary lane in each direction between I-84 and I-405 and to build new bicycle and pedestrian connections across I-5 and I-84. The project aims to address growing congestion, increase travel reliability for passenger and freight vehicles and enhance neighborhood connectivity.
- Oregon 217 ($98 million) – ODOT will build new auxiliary lanes south from Beaverton-Hillsdale Highway to Oregon 99W and north from OR 99W to Scholls Ferry Road. The goal of this project is to address congestion and increase travel reliability.
- I-205 corridor bottleneck project ($15.5 million) – An auxiliary lane will be added on the northbound stretch of I-205 from Powell Boulevard to the I-84 west
interchange. It is estimated that this project will reduce the frequency of crashes by nearly 30% in addition to providing more reliable travel times.

- I-205 active traffic management project ($15.2 million) – This project will use technology to provide travelers with real-time information on travel times, congestion, crashes, and other hazards. A similar system was implemented on OR 217, which resulted in a 21% decrease in crashes in the first year of use.

**Jurisdictional Transfers**

Keep Oregon Moving also includes several jurisdictional transfers of highways, with two in the Portland region. These transfers seek to place highways under the jurisdiction which can best control and manage the facilities. The transfers for the Portland region are:

- Cornelius Pass Road between US 30 and US 26 will be transferred from Washington and Multnomah counties to ODOT.
- Powell Boulevard between I-205 and the Portland city limits will be transferred from ODOT to the City of Portland. Keep Oregon Moving also allocated $110 million to upgrade this section of Powell Blvd.

**2015 Federal Transportation Bill (FAST Act)**

The current federal transportation act of 2015 specifically addressed freight movement and provided federal money to the states along with federal grant opportunities to fund freight and goods movement projects.

The FAST Act, signed into law in December 2015 authorizes more than $305 billion in transportation investments over fiscal years 2016 through 2020. It builds upon Moving Ahead for Progress in the 21st Century Act (MAP-21) enacted in 2012. There are three primary goals of the FAST Act: Improve mobility on highways; create jobs and support economic growth; and accelerate project delivery and promote innovation. Highlights from the bill and its impacts to Oregon include:

**Highway Funding** – Oregon will see a five percent increase in transportation funds as a result of the Act – rising from $482 million per year to $507 million in FY 2016, and then rising two percent each subsequent year.

**Freight Funding** – Two new programs were created for planning and funding of freight mobility projects:

- **National Highway Freight Program** – Provides a new annual funding stream to states to address freight projects on the national highway system. In the first year of the program, ODOT received $14.5 million, increasing to $19 million by FY 2020.
- **Nationally Significant Freight and Highway Projects Program** – Funds a new competitive grant program to fund large freight and highway projects, and is referred to as the Fostering Advancement in Shipping and Transportation for the Long-term Achievement of National Efficiencies or FASTLANE program. This
program was authorized at $4.5 billion for years 2016 through 2020 with $800 million for FY 2016 to be awarded on a competitive basis. Metropolitan Planning Organization’s (MPOs), local governments, ports, and tribal governments are all eligible to apply for these funds. Large projects must cost a minimum of $100 million, and the federal grant funds can make up a maximum of 60 percent of the total cost. However, 10 percent of the program budget is set aside for smaller projects, as well as multimodal projects. Large projects are eligible for a minimum award of $25 million, and small projects, which are below the minimum large project threshold, are eligible for a minimum award of $5 million.

**Surface Transportation Program** – The Surface Transportation program was changed to the Surface Transportation Block Grant Program (STBGP) under the FAST Act. Accordingly, there are two updates:

**Increased local funding for large regions** – Regions with populations over 200,000 will see an increase in the availability of funds from the STBGP from 50 percent now to 55 percent over the course of the five-year bill.

**Transportation Alternatives** – Transportation Alternatives funds bike, pedestrian, and demand management projects. Previously a stand-alone program, Transportation Alternatives is now placed in the STBGP.

**Public transit** – Oregon saw a 5% increase in federal transit funding, receiving $98 million in FY 2016. The Buses and Bus Facilities Competitive Grant program was reinstated under the FAST Act.

**Surface transportation system funding alternatives** – A new competitive grant program, was funded at $15 million in FY 2016 and was created for states and multi-state groups to explore alternative funding mechanisms for the Highway Trust Fund (HTF). Currently funded primarily through the gas tax, the HTF is seeing reduced revenue as the fuel efficiency of vehicles has increased. The grants require states and multi-state groups to demonstrate a user-fee based funding structure that maintains the long-term financial health of the HTF. Oregon was awarded nearly $5 million for two grants in FY 2017 to improve the state’s innovative per mile road usage charge program and launch a pilot of the program in partnership with the State of California.

**Funding sources**
The following funding sources are currently available to the region.

Federal funding sources or programs (FHWA programs, unless otherwise noted):

- **Surface Transportation Block Grant (STBG) Program** (decisions on which projects are allocated funds are made at the regional level).
- **National Corridor Infrastructure Improvement Program** (decisions on which projects are allocated funds are made at the regional level).
• **Congestion Management and Air Quality Improvement Program**

• **Transportation Infrastructure Finance and Innovation Act (TIFIA):** Allowed the creation of state infrastructure banks through a federal credit. This is federal credit assistance for highway, transit, passenger rail, some freight rail, intermodal facilities and some modernization to port terminals.

• **Freight Intermodal Distribution Pilot Grant Program:** This program is for intermodal projects that relieve congestion, improve safety and facilitate intermodal trade.

• **Railway-Highway Crossing Program:** Elimination of Hazards and Installation of Protective Devices at Rail-Highway Crossing.

• **Maritime Administration (MARAD):** Marine Highway Grants potentially support projects at marine terminals on the Columbia and Willamette Rivers. Projects need eligibility for funding by being included on a designated project list. MARAD also funds shipyard improvements with Small Shipyard Grants.

• **Army Corps of Engineers (ACOE):** Columbia River channel maintenance is administered by ACOE. The Port of Portland maintains the channel navigation and gets reimbursement from ACOE.

• **Federal Aviation Administration (FAA):** Airport Improvement Program Grants provide funding for runway construction and rehabilitation, taxiway construction and rehabilitation, airfield improvements (lighting, signage, etc.) and other airport capital improvements.

**State funding sources**

The following list of funding sources is generally administered through ODOT:

• **Oregon Gas Tax/Vehicle Registration Fees.**

• **Oregon Weight Mile Tax:** Charged to trucks weighing over 26,000 pounds, the tax is the primary source of tax revenue raised by trucks in the state. Weight Mile Tax receipts are primarily directed at roadway maintenance and system preservation efforts throughout Oregon, with a smaller amount allocated to administering the program.

• **Oregon Energy Income Tax Credit:** The Oregon Department of Energy offers a tax credit for businesses that invest in reducing energy consumption. Under this program transportation projects that reduce the number of single-occupancy vehicle trips are eligible for the credit. The credit covers up to 35 percent of eligible project costs.

• **Connect Oregon:** Funded through lottery proceeds, this effort has focused on projects that enhance intermodal connections and improve freight mobility for several modes, including aviation, marine and freight rail.
• **Immediate Opportunity Fund**: The purpose of the Immediate Opportunity Fund (IOF) is to support primary economic development in Oregon through the construction and improvement of streets and roads. One of IOF’s project types is specific to funding “preparation of regionally significant industrial areas” (type D).²⁵

The Connect Oregon program has shown that government and the private sector can collaborate successfully. These programs have delivered tangible benefits to freight movement within the Portland metro region and the state. The program has proven particularly useful in funding much needed projects for off-highway modes. Dedicating the loan revenues from the Connect Oregon program into a revolving fund could help the program be more self-sustaining.

**Local funding**

Local jurisdictions within the region have local funding sources such as gas tax, parking fees and system development charges. These funds are not specific to freight projects, but help build and maintain the overall system, including the regional freight network.

**Funding history**

Prior to the increase from federal and state tax bills, revenue for transportation was in decline for many years.

Nationally, funding for transportation projects has become scarce. The need to replace aging transportation infrastructure and expand facilities in areas of the country experiencing growth has exploded. The private sector portion of the goods movement community has been making great strides in adopting sustainable technologies and wringing efficiencies out of their respective portions of the goods movement system. The public sector must also effectively weigh policies, programs and investments to achieve the maximum benefit for the goods movement system, particularly during a time of uncertain funding for transportation.

Accounting for inflation, public sector funding for transportation infrastructure, particularly targeting freight movement, had diminished across the United States over time. Even with recent federal recovery efforts and state legislation, competition for available funds will increase, and most road funds are likely to be funneled into critical safety projects. For most of the first decade of this century, the cost of construction materials had risen significantly on the global market, greatly increasing the cost to construct infrastructure improvements. Simply put, costs to construct improvements having been trending upward rapidly, while available revenues to pay for them had been declining. Deferred maintenance and delayed projects have cost individuals and businesses in terms of lost time and opportunities, increased vehicle wear and tear and threatened or lost jobs. The prior lack of investment in the US transportation infrastructure has weakened our ability to compete globally against...

China, India and the European Union, all of which are investing heavily in transportation. The successful implementation of any programs or projects in these times requires coordination at all levels of government with the business community to address the immediate and long-term freight transportation funding needs.
CHAPTER 8
FREIGHT ACTIONS

8.1 Linking Freight Policy and Issues to Investments and Action

This chapter includes a “tool kit” of freight actions that respond to a broad range of needs and issues clustered around the seven policies in Chapter 3. Chapter 8 constitutes the regional freight action plan.

Many of the actions described are foundational activities that hold the regional freight action plan together like planning, coordinating, research and policy making and take place on both an ongoing and cyclic basis. The current list of efforts will need to find staff, time and funding resources, whether that includes Metro, members of the freight, goods movement and economic development community, or other agencies or organizations. The 2010 Regional Freight Plan had a longer list of freight action items that has been winnowed down into a smaller selection of important, achievable near-term actions, and a few long term actions that will require additional scoping and determining the availability of staff time. The near-term action items should be achievable within the next 5 years and the long-term actions would take longer than 5 years.

Achievable near-term action and long-term action items are included and recommended for implementation to support the approved regional freight and goods movement policies. Each of the freight action items is associated with one of the seven regional freight and goods movement policies (Policies 1 to 7).

The 2018 RTP Freight Projects and Programs are included in an appendix to this freight strategy and are also included by reference as part of Action 6.1

8.2 Policy 1. Plan and manage our multimodal freight transportation infrastructure using a systems approach, coordinating regional and local decisions to maintain seamless freight movement and access to industrial areas and intermodal facilities

This policy, as well as its related actions, speaks to Metro’s mission as the metropolitan planning organization for the Portland metro area. Actions described below will give us better freight and goods movement data and will guide planning efforts to ensure that freight considerations are in mind, and to implement a multimodal plan that facilitates freight movements required for a vibrant regional and state economy.

Near-term Actions:

- 1.1: Better define, preserve and enhance freight function in mobility corridors

  In general, the freight mobility function is addressed as part of the regional mobility corridors. Define, preserve and enhance the freight function of the freight network within individual mobility corridors by evaluating deficiencies. Address freight
operational needs on the regional freight network with project improvements in freight corridors that should ensure continued freight access and mobility as a primary outcome.

- **1.2: Maintain private sector cooperation with Metro’s planning and technical coordination, and with goods movement policy**
  - Areas where the private sector and government agencies could provide value to Metro include:
    - Implementation of the Regional Freight Strategy
      - Review, assist, comment, contribute and/or lead various elements of the action plan
      - Contribute to future freight strategy refinements and updates
    - Regional planning efforts
      - System planning, modeling and analysis
    - Freight access/industrial land aspects of land use planning
      - Input into selecting and carrying out regional corridor refinement plans
      - Metropolitan Transportation Improvement Program (MTIP) funding and project selection processes
      - Provide input into Connect Oregon criteria and selection
      - Development of analytical tools, data bases, performance measures and policies
      - Prioritization of investments and projects with a freight and economic development perspective
      - Metro’s freight program staff will participate on effective local, state and national freight-relevant organizations, such as the Portland Freight Committee, the Columbia Corridor Association, ODOT's statewide freight planning group, and the Oregon Freight Advisory Committee
      - Assisting localities with transportation system plan (TSP) freight components
    - Freight and goods movement, jobs and economic development
      - Develop policy and business support for transportation funding initiatives, including possible fees or pricing strategies
      - Define economic development context and goals for freight and goods movement policies and investments
Support for broad regional prosperity and environmental justice with an economic development strategy

- Sustainability
  - Greening freight and industry while promoting sustainable jobs and economic growth
  - Greenhouse gas and other environmental impact reduction strategy development

- Public education and stakeholder engagement
  - Feature freight issues in periodic Regional Snapshots and the Snapshot speakers series (as defined in Action 3.2)

1.3: Continue baseline freight and goods movement data collection and reporting activities

- Keeping data current in an environment that is volatile, is as challenging as it is essential. This recommended action ensures needed support for ongoing data collection and necessary expansions to existing efforts, such as PORTAL, ensuring updates to the commodity flow forecast, continuing to seek more detailed freight and goods movement flow data at the regional level, etc. Freight and business stakeholder interviews should be held periodically to provide early detection of problems and opportunities affecting the flow of goods and our regional economy. Collecting data sufficient to support other tasks, enabling the region to assess a wide variety of outcomes, including jobs creation, value/tons moved, economic impacts, cost of delays, emissions, energy use, neighborhood impacts and others associated with freight movement. In addition, new goals and programs for greenhouse gas reduction, and a regional congestion pricing pilot program, will change regional data needs.

1.4: Coordinate research, modeling and planning with Oregon Department of Transportation (ODOT)

- Coordination with ODOT is sufficiently important to be called out specifically. All efforts in recommendation 1.4 should include ODOT as a partner. Metro staff will work with ODOT’s freight planners and the Washington Department of Transportation to consult and coordinate with respect to the statewide freight plan as well as periodic updates to the National Highway System/National Network freight designations.
Long-term Actions:

- **1.5: Develop and conduct freight and goods movement research program**

  - In general, freight is a less well understood component of the regional transportation system; many regions are struggling to improve and integrate such tools as basic freight data, performance measures and analytic and modeling tools. The Regional Freight Strategy distinguishes between the specialized needs for moving industrial/agricultural commodities through and beyond the region and the day-to-day needs of urban goods movement within the region’s mobility corridors and 2040 centers. Yet this distinction requires the use of analytical tools which can shed light on those two categories of goods movement within our region. It also requires close coordination between Metro and ODOT.

In order to develop and/or refine freight-relevant analytical tools that can help Metro and its partners better predict, manage and invest for freight and goods movement; these elements of a research program should be considered:

- Continuing to develop the regional freight model
- Developing explicit linkages between improvements to freight components of Metro’s regional model and the Oregon statewide model, focusing on enhancing the regional distribution component
- More fully incorporating freight trip time reliability performance measures into Metro’s transportation and land use planning and project prioritization criteria
- Finding and evaluating solutions for reliability and economic impacts for the next RTP update
- Exploring multiple data sources on the impacts that on-demand delivery (via Amazon, FedEx and other home deliveries) is having on transportation demand, and identifying ways to keep goods moving efficiently
- Seeking funding for desired elements of a research program through existing and new programs, as appropriate

**8.3 Policy 2. Manage first-rate multimodal freight networks to reduce delay, increase reliability, improve safety and provide shipping choices**

This category comprises the first step to improved freight and goods movement operations on the existing system and includes preservation, maintenance and operations-focused projects and associated planning and coordinating activities. It focuses on using the system we have more effectively.
Near-term Actions:

- **2.1: Assess need to develop and fund better incident management and traveler information**
  
  - Real-time travel information (focused on truckers) to avoid incidents and find detours is increasingly important, particularly to improving reliability performance. Incident clearing resources and regionally coordinated efforts to manage incidents must be sufficiently funded. This action item would direct attention on deficiencies to be addressed.

- **2.2: Continue support for use and expansion of ITS system management tools**
  
  - Begin to address need for 24/7 congestion mapping for the multimodal freight system, among other needs. Support PORTAL’s program of real-time traffic delay; provide GPS active (in cab) truck route management, electronic routing and signage.

- **2.3: Support workforce access to the region’s industrial jobs through Metro RTO/TDM programs**
  
  - The regional freight work group recognizes the need for Metro’s transportation demand management programs and supports non-auto mobility choices for workers to get to their jobs. If options are limited in certain industrial areas, deficiencies will be highlighted for the region to address. Efforts to improve alternative transportation options for workers will include partnering with TriMet and other service providers to ensure adequate transit service frequency and good access to high employment areas.

Long-term Actions:

- **2.4: Identify key mobility corridors for testing and development of Connected Vehicle (CV) infrastructure and other ITS strategies**
  
  - Key mobility corridors for testing would be identified by the freight functions of roadways within the corridors and the truck usage of those roadways. Coordination with the state, counties and cities would be required to develop which types of CV infrastructure would be used, and for the selection of a few key mobility corridors and roadways for testing and implementation. The testing will include an analysis of the types of changes to the infrastructure and the types of trucks impacted. Metro will monitor developments in, and the impacts of implementing connected vehicle technology to inform future freight planning efforts and to maintain our competitiveness in goods movement.
8.4 Policy 3. Better integrate freight issues in regional and local planning and communication to inform the public and decision-makers on the importance of freight and goods movement issues

To gain public support for projects and funding of freight initiatives, and to help the public and elected officials make more strategic land use and transportation decisions, a program of public education is required.

Near-term Actions:

- **3.1: Establish stakeholder outreach program**
  - Make use of an ongoing relationship with the freight community to provide topical and informative briefings to Metro’s various audiences. The Portland Freight Committee and the Oregon Freight Advisory Committee (in which Metro participates) are the current groups to provide outreach to. Metro will provide additional outreach to the broader freight community, along with outreach to MPAC, JPACT and interested elected officials.

- **3.2: Provide support for topical fact sheets, and other published media that expands awareness of freight issues**
  - The Regional Snapshots are a series of quarterly web publications that provide readers with an approachable, engaging “State of the Region” update on a major topic of interest, such as jobs, housing, transportation, or the economy. The Snapshot tells the story of greater Portland through interactive charts, graphs, personal stories, interviews, videos and profiles of places across the region.

    The Snapshot Speaker Series complements the online Regional Snapshot that dives deeper into the issues discussed in each edition. They feature topical experts from across the nation who can share best practices and lessons learned with our local policymakers and other stakeholders, and can be any of a wide range of formats including walking tours, panel discussions and workshops.

    The Regional Snapshot program will be used to provide a spotlight on freight issues with periodic web topics and speakers. A key topic to articulate better is the link between freight and goods movement investments and environmental justice (reducing hot spot congestion and pollutants) and economic equity (good, family wage jobs in one of the few sectors that do not always require higher education). Another topic would be how to reduce idling of freight and passenger vehicles in order to reduce harmful pollutants. Freight planning and presentations should be provided regularly so the public can stay informed on freight needs and issues.
• **3.3: Coordinate with Economic Value Atlas work which includes the economic development community**

  ➢ Metro will continue to reach out to the economic development community, including the Portland Business Alliance, the Columbia Corridor Association, West Side Economic Alliance and others. Metro staff will work with these partners, and the Economic Value Atlas program, to support an economic development strategy for the region that is coordinated with infrastructure investment that supports freight, transit, equity and other economic issues.

**8.5 Policy 4. Pursue a sustainable, multimodal freight transportation system that supports the health of the economy, communities and the environment through clean, green and smart technologies and practices**

This category of issues and solutions deals with traditional nuisance and hot spot issues associated with “smokestack and tailpipe” problems, but it also recognizes the many current contributions and new opportunities for the evolving green freight community to be part of the larger environmental and economic solution set required in these times, including greenhouse gas curtailments.

**Near-term Actions:**

• **4.1: Provide useful “green freight” links from Metro’s freight program webpage**

  ➢ This would be a web resource that could provide information on best practices in sustainable freight, and direct our regional stakeholders to useful local, state and national programs and resources. This web resource would help identify what emission and greenhouse gas reductions can be expected from regional freight and goods movement activities. This action would be covered under Metro’s Regional Snapshot program web page.

• **4.2: Pursue greenhouse gas and other pollutant reduction policies and strategies for freight that transitions the region to lower or zero emission freight vehicles and equipment**

  ➢ Explore how local government and private industry can collaboratively reduce the emissions produced by trucks and still have shippers and freight carriers meet their customer’s needs. Research into this action should identify strategies, projects or programs that best meet transportation, safety and air quality goals that are synonymous with efficient goods movements. Metro will work with DEQ and other regional partners to explore and define potential environmental benefits in the following areas:
• Procedures for measuring greenhouse gas impacts of freight and evaluating the net greenhouse gas impact of freight projects;

• Programs, policies and projects for cost-effective net reduction of greenhouse gas and other pollutants, such as industrial symbiosis (businesses sharing resources and possibly using neighbors’ waste products in their processes), incentives for zero/low emission delivery vehicles and alternative fueling stations, public/private urban consolidation centers, off-hours delivery programs; and

• Leveraging and possibly expanding diesel retrofit programs, and promoting diesel engine idling reduction regulations at the state and local level.

Note: Metro staff will be asking the Oregon Department of Environmental Quality (DEQ) to take this action as part of their work program.

- 4.3: Incorporate updated DEQ diesel emissions inventory data into regional and local freight plans

  Diesel emissions inventory data will be useful for tracking progress on reducing diesel emission at the regional and local level, and for identifying locations where elevated diesel exhaust is considered a health risk to residents and employees in these areas. DEQ is currently contracting to update the inventory of off-road diesel equipment. It is important to include this regional freight strategy action as part of the RTP update since local transportation system plans must be consistent with the RTP.

- 4.4: Support and partner with local jurisdictions to develop policies to phase out older and dirtier diesel truck engines and diesel equipment used in the transport of freight

  Older diesel engines are less efficient and pollute more than newer engines. They use more fuel and require more maintenance. However, upfront costs of replacement are a financial burden for businesses. Metro will partner with local jurisdictions and the State of Oregon to expand programs that provide incentives for retrofitting or replacing these older diesel engines. Metro will support funding for efforts like the Clean Diesel Initiative that provided funds to local businesses in the form of matched dollars, grants and low interest loans to initiate retrofits or diesel engine replacements.

8.6 Policy 5. Protect critical freight corridors and access to industrial lands by integrating freight mobility and access needs into land use and transportation plans and street design

Jobs are an important element of quality of life for the region. With that fact in mind, this category targets land use planning and design issues that can affect the ability of freight, goods movement and industrial uses to live harmoniously with their neighbors. Freight-
sensitive land use planning includes everything from long range aspirations for freight and industrial lands to short-term and smaller scale design and access issues.

Near-term Actions:

- **5.1: Continue to implement land use strategies to protect existing supply of industrial land**
  
  - Staff will identify lessons learned from previous efforts in the region and look at the most effective ways to protect high-value industrial land and prioritize and protect the value of freight investments to serve such areas. Protecting existing industrial land is part of the Urban Growth Management Functional Plan. This action will also focus on the economic impacts of failing to preserve and serve industrial lands. This will be tied in with Action 3.3 above.

- **5.2: Provide a freight perspective to the revision of Metro’s ‘Creating Livable Streets’ design guidelines**
  
  - Moving and delivering goods is a key function of the region’s highways and streets. Integrating freight and goods movement into our livable communities as they develop will require special roadway design considerations.
  
  - As Metro updates its latest edition of “Creating livable streets: Street design guidelines for 2040,” Metro will address the recommendations in the “Truck and Street Design Recommendations Technical Report” (May 2007). The update will coordinate with regional stakeholders to ensure that design guidelines on regional intermodal connectors and other key freight roadways keep in mind freight considerations.
  
  - Metro will ensure appropriate freight and goods movement representation on the technical work group that will provide input on the revision of the guidelines.

  **Design Elements and Consideration for Freight**

  *To be completed later.*

Long-term Actions:

- **5.3: Examine need for additional industrial land and the availability and readiness of industrial lands**
  
  - The region must ensure a continued adequate supply of appropriate industrial land. In addition to internal coordination between Metro’s planning and land use staff, and coordination with local jurisdictions and industry sectors, an understanding of how cities and counties have been successful in maintaining and improving the availability and readiness of industrial lands will be pursued.
Metro currently tracks the availability and readiness of industrial tracks in the region that are 25 acres or larger through the Regional Industrial Inventory Project.

8.7 Policy 6. Invest in our multimodal freight transportation system, including road, air, marine and rail facilities to ensure that the region and its businesses stay economically competitive

This category of solutions focuses on planning and building capital projects and developing the funding sources, partnerships and coordination to implement them. It includes the list of regional freight project priorities attached as Appendix B to this report identifying a wide range of projects from preservation and maintenance to major facility construction.

Near-term Actions:

- **6.1: Work toward implementation of the RTP freight priority projects**
  - Advocacy for the prioritized list of regional freight projects within the approved RTP project list will be needed. This will include supporting funding needs and initiatives to build desired projects. In general, consistent with the message presented throughout this action plan, major investments for freight-oriented preservation, management and “build” projects should focus on:
    - Carefully evaluating what, where and when the freight problems occur (e.g., noting that they do not always coincide with the commute peaks)
    - Addressing core throughway system bottlenecks with substantial freight impacts, to improve truck mobility in and through the region. Examples include the Columbia River Crossing, the I-5 Rose Quarter, I-205 South and Highway 217.
    - Improving and protecting the throughway interchanges that provide access to major industrial areas, particularly: I-5/Marine Drive and I-5/Columbia Blvd serving the Columbia Corridor and Rivergate industrial areas, I-205/OR 212 serving the Clackamas and Milwaukie industrial areas, and I-205/Airport Way serving Portland International Airport and east Columbia Corridor industrial areas
    - Improving arterial connections to current and emerging industrial areas
    - Ensuring safe transport of hazardous loads with a regional routing strategy
    - Looking beyond the roadway network to address critical marine and freight rail transportation needs such as maintenance of the Columbia River channel and upgrading main line and rail yard infrastructure
• **6.2: Strengthen the tie between project prioritization and the framework for freight performance**

- Metro recognizes that while autos and trucks must share the same network, auto trips can more easily be diverted off the highway system via a number of satisfactory existing or planned alternatives including high capacity transit, a supporting bus network, and regional and corridor bicycle and pedestrian systems in various stages of completeness. Thus, the dependence of trucks and truck-related commerce on the regional freight network should be recognized as a factor in roadway project prioritization. This action item relies in part on improving the understanding and rigor of freight-related performance measures within Metro’s modeling protocols: are we measuring what is relevant to know about freight? In addition, this action depends on technical staff and the freight/jobs/economic development community’s ability to articulate fact-based net benefits of strategic goods movement and business-friendly investments and to compete effectively for regional dollars and attention within the decision-making structure of their respective local jurisdictions.

• **6.3: When appropriate, focus regional funds on large capital projects**

- Based on solid performance measures and other indicators of need and effectiveness, fully vetted through regional planning processes, it makes sense in some cases for the region to focus its funding on one large project. ODOT’s Freight Highway Bottleneck Project and delay area point to I-5 from I-84 to the Columbia River Bridge and other locations in the region that may require major capital projects. Some examples are the throughway system bottleneck projects listed in Action 6.1.

• **6.4: Make strategic incremental improvements when large capital projects are unfunded**

- When funds are not available for major system improvements, make incremental improvements to those facilities through less costly strategies using tools such as intelligent transportation systems, transportation system management and transportation demand management. Also, phase larger improvements, or ensure that projects move along through completing preliminary engineering, right-of-way acquisition or other steps toward construction.
• 6.5: Ensure that unfunded freight projects are on an aspirational or strategic RTP project list

➢ The region should be prepared to ensure that unfunded projects could at least be considered if unusual, one-time, or new funding sources become available.

• 6.6: Develop a regional freight rail strategy

➢ Many hopes are pinned on the potential for regional freight rail to accommodate a greater share of the future demand for goods movement capacity. However, there is a lack of depth in understanding from an operational or investment perspective how that potential could be realized. For example, the I-5 Trade and Capacity studies indicated that there was adequate capacity for the existing level of passenger train frequency along the north/south corridor. However, that capacity would be at the expense of freight train operations for both Union Pacific and Burlington Northern Santa Fe region-wide, creating hot spot congestion, minimizing the possibility of growing freight rail commerce and degrading freight rail service throughout the Pacific Northwest and resulting in more trucks on the region’s highways. The Portland Metro region is committed to a variety of passenger rail modes and must reckon with the interactions with the freight rail system.

In addition, regional demand and support for pedestrian and bicycle trails, frequently puts pressure on existing freight rail capacity and operations. Issues of freight rail capacity, liability, safety, cost and efficiency must be balanced with other regional goals, based on common factual understanding of the underlying issues.

This action calls for a consultant-assisted technical regional rail study that would provide a foundation for developing the policy framework described earlier and could incorporate that work as part of the study. Development of the strategy could include evaluation of public ownership and control of current or potential future passenger rail routes within the region or state as part of a regional freight management strategy.

In addition to Metro’s local jurisdictional partners, Class 1 railroads, the regional short line operator, TriMet, ODOT Region 1, ODOT Rail Division, the Ports and major shippers/customers would be critical stakeholders.
Long-term Actions:

- **6.7: Develop policy and evaluation tools to guide public investment in private freight infrastructure, focused on rail projects**

  ➢ When staff capacity allows, more clearly define private and public sector roles, including incorporation of the identified state role in freight infrastructure planning and investment that is emerging from the statewide freight planning effort. This planning and analytical effort would answer the question “what are we trying to do with our freight investments?” and it would yield practical and usable performance measures and investment guidelines for public development of freight assets or services when they are wholly or partially private. It would also help to correctly phase developments, based on public benefits and identify equitable funding strategies. Rail/roadway grade separation projects and a short-line investment strategy could be key focus areas for such policy development.

  ➢ Public investment could be appropriate, for example, when it:

    - Leverages private investment
    - Allows progression of a needed project that would otherwise not occur for a relatively modest investment
    - Involves a facility’s yard or terminal but has regional impacts
    - Pays for intermodal links
    - Creates new passenger capacity by solving freight bottlenecks
    - Preserves or creates jobs, generates wealth and taxes
    - Allows for more competition, modes or choices to shippers, businesses or consumers
    - Increases overall benefits more than it improves any single mode or facility

**Note:** Private investment in public infrastructure—apart from development fees—should also be part of this policy discussion.

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**8.8 Policy 7: Eliminate fatalities and serious injuries caused by freight vehicle crashes with passenger vehicles, bicycles, and pedestrians, by improving roadway and freight operational safety**

This category of policy and design solutions focuses on addressing the issue of eliminating fatalities and serious injuries due to freight vehicle crashes with passenger vehicles, bicycles and pedestrians.
Near-term Actions:

- **7.1: Promote and advocate with the cities and counties for the implementation of truck side guards on large freight trucks providing public services (i.e., sanitation and recycling) consistent with USDOT specifications.**

  - Side guards are safety equipment used on large trucks to reduce fatalities and major injuries with side impact crashes. Large cities across the United States are identifying side guards as a proactive way to provide a safer atmosphere for cycling and walking next to large trucks within increasingly dense urban areas.

  - City of Portland Bureau of Planning and Sustainability has committed to coordinate a pilot project to install side guards on 18 sanitation (garbage) and recycling trucks operating in Portland. As of November 2017, the city had overseen the installation of side guards on three trucks.

  - Metro will work with the City of Portland Bureau of Planning and Sustainability to promote the completion of the pilot project, and consider expanding the project to more sanitation and recycling trucks. Metro will advocate for the city to consider a program that eventually begins the installation of side guards on all large trucks that the city has control over through licensing and franchises for city services. Metro may also consider a pilot project like the one at the City of Portland for the large trucks that handle the solid waste disposal and transportation services from Metro’s two transfer stations to one or two landfills outside the region.

  - Metro will reach out to Clackamas, Multnomah and Washington counties, and larger cities in the region to see if there is interest in starting pilot projects to install side guards on large sanitation and recycling trucks operating within their jurisdictions.

- **7.2: Develop design guidance for identifying and prioritizing improvements to regional intermodal connectors that should have bike and pedestrian facilities that are separated from the roadway and other design treatments to enhance the safety of non-motorized modes.**

  - As Metro updates its latest edition of “Creating livable streets: Street design guidelines for 2040,” Metro will coordinate with regional stakeholders to identify design guidelines on regional intermodal connectors and other key freight roadways that enhance the safety of non-motorized modes (see Action 5.2).

  - Due to the volume and size of trucks on the regional intermodal connectors, the design guidance will likely be separation of the bike and pedestrian facilities from the roadway and parallel roads or alternative routes that are separate from the intermodal connector to enhance safety.
Once the design guidelines on regional intermodal connectors and other key freight roadways have been established, Metro will develop criteria for identifying which of these freight roadways has the greatest need for improvements that enhance safety for non-motorized modes. Potential criteria could include a history of locations with serious crashes, the number of daily trucks, the percentage of truck traffic, number of daily bike trips, number of daily pedestrian crossings at key intersections, and proximity to schools and other facilities that generate bike trips and pedestrian activity. Once the freight roadways and intersections with the greatest needs are identified, Metro would coordinate with the counties and cities to develop multimodal freight safety projects that would be included in the Regional Transportation Plan. Projects that enhance the safety of bicyclist and pedestrians could include off-street multi-use paths, or truck aprons and other intersection safety improvements.
CHAPTER 9

IMPLEMENTATION

9.1 Implementing Adopted Freight Plans

In addition to regional policy and program development and implementation, concrete freight related projects must be built when they are needed to ensure that the goals of the Regional Freight Strategy are met.

9.2 RTP Freight Projects and Programs

Appendix A is a list of all 2040 RTP Freight Projects that were nominated by ODOT, the Port of Portland, Clackamas, Multnomah and Washington counties, and the cities within the region that represent Round 2 of the RTP call for projects. Freight projects are defined as all those RTP projects with an investment category of “Freight” or “Throughways” and some of the “Roads and Bridges” category. “Throughway” projects are considered to be freight projects since they are on the interstates and state highways within the region and are also the main roadway routes on the Regional Freight Network map. Under the “Roads and Bridges” category, freight projects are on facilities that are on the Regional Freight Network map, or are projects that provide freight access to intermodal facilities and/or industrial areas. The Regional Freight Work Group reviewed the investments under “Roads and Bridges” to ensure the projects met the criteria for being a freight project.

Figure 21 (on next page) maps out the 2040 Financially Constrained Freight Projects from Appendix A.
9.3 Freight data collection and analysis

Portland State University's Intelligent Transportation Systems Laboratory has begun a project to produce truck travel time estimates using the transponder information from ODOT's Green Light weight-in-motion system. The system can supplement Trip-check's traveler information system as well as help calculate key freight measurements by linking the other data collected by the weigh stations to the travel time estimates. The ITS lab at PSU houses and maintains the Portland Oregon Regional Transportation Archive Listing. PORTAL collects data from all of the in-bed loop detection sensors in the Portland area as well as free floating dynamic sensors that can be placed in TriMet buses or other vehicles. The archive also collects weather and incident reports, all of which can be accessed in a variety of methods to help monitor and evaluate traffic improvements and patterns.

Commodity Flow Forecast (Port of Portland)

Metro has deployed commodity-flow based truck models for almost 20 years. These models have utilized federal data on national and international commodities movement based on the Freight Analysis Framework (FAF) that informed Metro and the Ports of Portland and Vancouver. The FAF is produced through a partnership between Bureau of Transportation Statistics (BTS) and Federal Highway Administration (FHWA), and integrates data from a variety of sources to create a comprehensive picture of freight movement among states and major metropolitan areas by all freight modes of transportation. The current model is based on FAF3, which utilized data gathered from the 2007 Commodity Flow Survey (CFS), together with data from several other sources.

The Port of Portland Commodity Flow Forecast was developed and completed by Cambridge Systematics in 2014 and 2015. The overall purpose of the Commodity Flow Forecast was to develop a commodity flow database that used the FAF3 data and produce a future forecast that is sensitive to the unique commodity movements within, and coming out of, the Portland-Vancouver Region. The region consists of six counties: Clackamas, Columbia, Washington, Multnomah and Yamhill in Oregon, and Clark County in Washington State. Several other sources for regional commodities movement unique to the Portland-Vancouver Region were also used for the forecast.

The Port of Portland Commodity Flow Forecast produced a set of 2007 base year data. The inputs to the base year volumes of commodities were adjusted for auto imports and waste and scrap material based on available local data. Flows of commodities by direction (inbound, outbound, and within the region) were identified for both tonnage and value. Flows of commodities by trade type (domestic, imports and exports) were also identified for tonnage and value. The top domestic, import and export commodities were also identified for tonnage and value. The top domestic products by value are electronics at 11%, mixed freight (restaurant supplies, grocery food and supplies, and office supplies) at 9%, machinery at 9%, gasoline and other fuels at 8%, and motorized vehicles at 8%. The top imported products by value are motorized vehicles at 32%, gasoline and other fuels at 13%, and machinery at 10%. The top exported products by value are cereal grains at 14%,
other agricultural products at 9%, machinery at 9%, motorized vehicles at 9%, electronics at 8%, and transportation equipment at 8%.

The Commodity Flow Forecast also produced a set of 2040 future year data. Adjustments were made to future volumes for cereal grains, auto imports, non-metallic mineral products and precision instruments based on more localized forecasts that are more accurate. Flows of future commodities by direction and by trade type, with growth rates, were calculated for 2040 by both tonnage and value.

**Economic Value Atlas**

In 2017, Metro initiated efforts in support of economic development activities by working together with key partners and stakeholders to develop an Economic Value Atlas (EVA). The EVA will provide tools and analysis to better align planning and public investments to strengthen the regional economy. It will provide a picture of the regional economy that will be used to align and help inform future investment decisions by defining outcomes that will support the economy across the region. Economic data in the EVA can also help identify future investment areas, where regional attention can support local partners to establish needed infrastructure, strategies, or policy changes to create beneficial economic outcomes.

This project will provide a solid data foundation for key regional activities such as:

- Defining potential areas for partners to collaborate and develop shared investment strategies in support of economic and workforce development.
- Providing a data driven picture of the regional economy to align investments that achieve the coordinated vision of Greater Portland 2020, the 2040 Growth Concept and the Regional Transportation Plan.
- Pin-pointing areas of focus for regional investment to bridge local and regional economic development aspirations.
- Outlining a path to pursue policies, actions and investments that help secure these outcomes.

A set of desired regional principles specific to economic outcomes for people, businesses, and places are being identified by the Economic Value Atlas Task Force. The Task Force includes economic and workforce development organizations, industry sector representatives, social equity focused organizations, and organizations representing interests across multiple types of infrastructure; therefore creating a broad base of partners interested in building an inclusive regional economy. A technical work group has been formed to establish quantifiable criteria and a method to visually exhibit economic conditions among communities across the region, to understand how infrastructure investment, land use strategies, and business or workforce development activities may be targeted to advance desired economic outcomes locally and regionally.
New Regional Freight Model

The new Metro Freight Model is designed to replace the current trip-based truck model previously developed. The model simulates movement of individual shipments throughout the supply chain including both direct shipments and shipments traveling through transshipment facilities. Shipments are allocated to trucks of various classes and the movements of all freight vehicles are simulated over the course of a typical weekday. The freight model development project included an array of participants including Metro, the Oregon Department of Transportation (ODOT), the Port of Portland, and local agencies throughout the region.

The freight model development project was completed February 2018. Since completion of the project did not occur until early 2018, the new Metro Freight Model has not been used for any of the regional freight system evaluation measures or any other analysis within the 2018 Regional Freight Strategy.

The primary objectives of the project are to:

- Develop tools to enable a more comprehensive analysis of infrastructure needs and policy choices pertaining to the movement of goods;
- Develop more detailed network assignments by truck type to support regional environmental analysis, as well as local traffic operations and engineering analysis;
- Develop freight forecasts that are responsive to changes in economic forecasts, changing growth rates among industrial sectors, and changing rates of economic exchange and commodity flows between sectors; and
- Replace the trip-based truck model with a more realistic tour-based model.

Current Model

The current truck model is based on commodity flows, a method deployed by Metro for almost 20 years. The trips in the current method are modeled as simple one-way trips and do not include service vehicles or parcel delivery. These models use data based on the Freight Analysis Framework (FAF) and are prepared under contract for Metro, Port of Portland and Port of Vancouver. The most recent update was in 2014 using FAF3 (2007) data. In the current model commodities are either produced in the region or enter the region via external highway cordon, marine port, rail yard, or air freight facility at Portland International Airport. For each long haul mode, a certain proportion is assumed to utilize trucks for a portion of the journey. Each group of commodities is associated with a group of employment types. Truck-borne commodities are distributed to Transportation Analysis Zones (TAZ) on the basis of TAZ employment. TAZ commodities are apportioned to heavy and medium trucks.
**New Model**

The new Freight Model was geared at filling in the gaps seen in the current model. It represents a new generation of “hybrid” models that micro-simulate both commodity supply chains and local truck tours. Similar applications have been successful in Chicago, Baltimore, Phoenix and the State of Florida. With the addition of new truck behavior data the model is able to simulate truck movements. Truck data was obtained by GPS traces of truck movements by vehicle class, dispatch data maintained by businesses, and detailed business establishment surveys with truck itineraries. In addition to all the above improvements the new Freight Model has the ability to take a more holistic approach to modeling. It has the ability to focus on major regional export sectors and produce data to evaluate the economic costs of bottlenecks.

The new model is no longer restricted to route diversion only and it includes Long-Haul freight mode choice and additional responses including:

- Time and frequencies of deliveries
- Number and length of tours
- Number of stops that can be made per tour
- Number of trucks needed to serve all customers

The new model also expands the truck classes to include light, medium and heavy. It has the ability to track commodities by Standard Classification of Transported Goods (SCTG) groups and the ability to track value by type of good, such as time-sensitive shipments. The new model also incorporates non-freight trucks, an option unavailable in the current model. It includes both service trucks and mail/parcel delivery trucks which are believed to account for over half of local truck VMT.

**Regional Benefits**

The new model will allow for improved ability to evaluate cost of congestion and benefits of freight improvements. It will offer a clearer understanding of land use policies such as the role of warehousing and distribution in the process and a better understanding of truck related environmental impacts which could lead to an increase in our freight system efficiency.

A complete summary of the new freight model is included as Appendix C of this Regional Freight Strategy.

**9.4 Future Freight Studies**

In October 2017, the Regional Freight Work Group (RFWG) discussed the need for future freight studies that should be called out in the 2018 Regional Freight Strategy. The RFWG discussed the need for the following four possible future freight studies:
• Regional Freight Rail Study
• Kenton Rail Line Study
• Willamette River Channel Deepening Study
• Regional Freight Delay and Commodities Movement Study

The RFWG recommended that the Regional Freight Rail Study, identified in the 2014 RTP as needed, should be included as a future freight study.

The RFWG did not make a recommendation on the Kenton Rail Line Study. This study was generally defined as a way to determine which at-grade railroad crossings of the Union Pacific (UP) Kenton main rail line, which runs from the Seattle main line at Columbia Boulevard and N. Hurst Avenue east to the Sandy River (just southeast of the Troutdale Airport), should be grade separated.

The RFWG did not make a recommendation on the Willamette River Channel Deepening Study. The Port of Portland later determined that the deepening of the channel was not suitable for study within the next 10 years and should not be included in the 2018 Regional Freight Strategy.

The RFWG recommended that the Regional Freight Delay and Commodities Movement Study should be included as a future freight study. The descriptions of the two studies that the RFWG recommended are included in the remaining part of this chapter.

Regional Freight Rail Study

The study would seek to identify and produce increases in rail capacity, safety, land use compatibility and operational efficiencies; which are important to our long-term economic and environmental sustainability and will help to maintain the region’s competitive advantage in a global marketplace.

Regional Freight/Passenger Rail Study - Expected Outcomes

Some of the potential outcomes of the proposed study are:

• Identification of economically viable opportunities to develop short line intermodal hubs or logistics parks or other cargo-oriented development

• A strategy to identify, develop and position top projects for confirmed and potential future federal and state funding as appropriate, including:
  o An updated, re-prioritized list of regional freight rail projects focused on improving capacity constraints and targeting industrial access to the rail networks
  o A funding strategy for regional freight/passenger rail bottlenecks
  o A strategy to fund needed grade separations including grade separation needs identified on the Kenton rail line
A strategy to fund critical modernization projects on the short rail lines

Fact-based guidance for stakeholders to use in negotiating claims over passenger/freight conflicts, balancing passenger and freight goals and a viable set of solutions and initiatives to meet those goals:

- Regional guidance for public/private investment partnerships to guide investment of regional and national pots of money in identifying and developing freight rail corridors of local, regional and national significance; and
- Specific guidance for local jurisdictions as they develop their transportation system plans (TSPs) in order to avoid or minimize conflicts, and preserve or enhance the functionality of rail facilities and connected industrial land uses

On January 22, 2015, Metro staff held a meeting with staff from City of Portland, Clackamas County, Multnomah County, Washington County, Port of Portland, ODOT Region 1, ODOT Rail, and a local rail expert to discuss the potential need and purpose for a Regional Freight/Passenger Rail Study.

The Port of Portland Rail Plan had concentrated on Class 1 railroad lines and was focused on the Port of Portland interests, especially the Port terminals. The Port’s plan did not focus much on the short lines and other non-Class 1 railroad lines that run in Clackamas County (west of the Willamette River) and Washington County. The Port’s plan identified grade separations as a key strategy to address capacity and safety including projects along the Kenton Line (Class 1 railroad line) in Portland and Multnomah County.

It was suggested that the study should examine the issue of long trains (up to 7,000 feet long) that take a long time to separate and store the cars when accessing Portland intermodal terminals due to a lack of storage capacity.

Clackamas County staff suggested that the study address freight rail and passenger rail within Clackamas County and Washington County. Clackamas County staff thought the study should look at improved short line service and providing sufficient freight rail service on the Brooklyn rail line.

Washington County staff stated that the county has shown interest in potential expansion of service and improving speeds with double-tracking some areas on the Portland Western railroad line. Washington County staff identified three areas for the study to consider: 1) Better understanding of existing and future private rail operations in Washington County; 2) Future added service on the WES commuter rail line; and 3) Pedestrian crossing improvements to enhance safety at railroad crossings.

City of Portland staff suggested that the study look at a regional strategy for when and how to partner with private railroads to address funding of rail projects.

ODOT Rail staff suggested that any study of rail capacity needs should consider operational improvements, and not just infrastructure expansion.
The group agreed that the study should move forward after the completion of the Regional Over-Dimensional Truck Route Study, and that the input received at this meeting should be considered by Metro in the scoping and budgeting for this study.

Metro staff determined that the Kenton Rail Line Study should become part of the Regional Freight Rail Study. The Regional Freight Rail Study will determine which at-grade railroad crossings of the UP Kenton main rail line should be grade separated.

**Regional Freight Delay and Commodities Movement Study**

The purpose of the study would be to evaluate the level of commodity movement on the regional freight network within each of the mobility corridors identified in the Regional Transportation Plan’s Mobility Corridor Atlas. The study would use Metro’s new freight model to summarize the general types of commodities, the tonnage of the commodities and the value of the commodities that are using these freight facilities within each of the mobility corridors. The study would also evaluate the need for improved access and mobility to and from regional industrial lands and intermodal facilities.

Some of the potential outcomes of the proposed study are:

- Developing a methodology for determining which freight facilities and mobility corridors are carrying the highest tonnage of goods and commodities and the highest amount of value for those commodities.

- Based on the tonnage and value of the goods and commodities carried in each corridor, a measure could be developed for which corridors should be prioritized for transportation projects based on their importance for freight and economic value.

- Based on the congestion and unreliability found in each of the mobility corridors, transportation projects could be developed and prioritized for corridors that have the most importance for freight and economic value.

- The study would likely utilize a new freight monitoring measure for reliability and the evaluation measures for cost of delay on the freight network and freight access to industrial land and intermodal facilities (being developed as part of the current RTP update).

The study will recommend prioritized freight projects for the next RTP and Regional Freight Plan based on the new freight measures, congestion, unreliability, accessibility and the highest tonnage and value of commodities within each mobility corridor.
CHAPTER 10

MEASURING PROGRESS

In 2012, the Moving Ahead for Progress in the 21st Century (MAP-21) created the most significant federal transportation policy shift since the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA). A fundamental element of the legislation was its focus on performance-based planning and programming. Fixing America’s Surface Transportation (FAST Act) passed Congress in December 2015, replacing MAP-21. The FAST Act did not make any major changes to the performance requirements of MAP-21 and did not add any new performance measures.

Performance-based planning

For the first time, MAP-21 established a performance-based planning framework intended to improve transparency and hold state transportation departments, transit agencies and metropolitan planning organizations (MPOs) accountable for the effectiveness of their transportation planning and investment choices. The objective of the new framework was to ensure states and MPOs invest federal resources in projects that will collectively make progress toward the achievement of the national goals identified in MAP-21.

National performance goals related to freight

The legislation established seven national performance goals for the federal-aid highway program and directed the USDOT to develop performance measures for each goal area. The following are the performance goals that relate to system reliability and freight movement and economic vitality:

- **System reliability** – To improve the efficiency of the surface transportation system.
- **Freight movement and economic vitality** – To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.

MAP-21 directed state transportation departments, transit agencies, and metropolitan planning organizations (MPOs) to incorporate a performance-based approach in their planning, including measures and targets, to be used in transportation decision-making. As part of a federal requirement for a Congestion Management Process (CMP), states, transit agencies and MPOs must set targets for measures specified by USDOT and track and report progress toward meeting these targets.

Performance measures have been identified through MAP-21 and subsequent USDOT rulemaking that must be reflected in the 2018 RTP. Table 6 below summarizes the federal performance measures identified for the performance goals related to freight and compares them to the current 2014 RTP Targets/Measures:
Table 6: MAP-21 National Goal Areas, Federal Performance Measures, and Existing RTP Measures

<table>
<thead>
<tr>
<th>National Goal Areas</th>
<th>Federal Performance Measure(s)</th>
<th>2014 RTP Target(s) / Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>System reliability</td>
<td>Percent of reliable person-miles traveled $^{26}$ on Interstate System and on the non-Interstate National Highway System</td>
<td>None – though reliability is called out as recommended as a system monitoring measure. Also, there’s a target labeled “freight reliability” but it measures delay, not reliability.</td>
</tr>
<tr>
<td>Freight movement and economic vitality</td>
<td>Percent of Interstate System miles with reliable truck travel times $^{27}$</td>
<td>By 2040, reduce vehicle hours of delay per truck trip by 10% compared to 2010.</td>
</tr>
</tbody>
</table>

Source: Metro RTP 2018

10.1 A New Freight Performance Target

The 2014 RTP Performance Targets identified one freight performance target. That performance target was called Freight Reliability, and was defined as:

By 2040, reduce vehicle hours of delay per truck trip by 10 percent compared to 2010.

This is not a true reliability measure. Reliability is a measure of the variability in travel time, not simply the delay in travel time. Researchers have devised feasible, data-driven methods to measure roadway reliability.

Staff recommends discussing how the region could support and apply such techniques to freight and mobility corridors. Metro has determined that the 2014 RTP freight performance target will be replaced by the federal performance measure for Freight movement and economic vitality using percent of Interstate System miles with reliable truck travel times.

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$^{26}$ Reliable defined as the ratio of the 80th percentile travel time of a reporting segment to a "normal" travel time (50th percentile), using data from FHWA's free National Performance Management Research Data Set or equivalent. Data are collected in 15-minute segments during all time periods other than 8 p.m.-6 a.m. local time. The measures are the percent of person-miles traveled on the relevant NHS areas that are reliable.

$^{27}$ The ratio will be generated by dividing the 95th percentile time by the normal time (50th percentile) for each segment. Then, the Index will be generated by multiplying each segment’s largest ratio of the five periods by its length, then dividing the sum of all length-weighted segments by the total length of Interstate. Reporting is divided into five periods: morning peak (6-10 a.m.), midday (10 a.m.-4 p.m.) and afternoon peak (4-8 p.m.) Mondays through Fridays; weekends (6 a.m.-8 p.m.); and overnights for all days (8 p.m.-6 a.m.)
10.2 Congestion Management Process (CMP) and MAP-21 Performance Measures and Targets Related to Freight

The Federal Highway Administration defines a Congestion Management Process (CMP) as “a process that provides for safe and effective integrated management and operation of the multimodal transportation system, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities...through the use of travel demand reduction (including intercity bus operators, employer-based commuting programs such as a carpool program, vanpool program, transit benefit program, parking cash-out program, shuttle program, or telework program), job access projects and operational management strategies.”

The CMP in the 2018 RTP includes a performance monitoring system that informs needed capital investments, such as new or improved transit and road capacity as well as demand and system management strategies to actively manage and optimize performance of the existing infrastructure. Key elements of the region’s CMP are addressed in the 2018 RTP and Appendix L of the RTP (Federal Performance-Based Planning and Congestion Management Processes). The key element in the region’s CMP that relates to freight is the “establishment of multimodal performance measures”, which includes RTP and Federal Performance Measures and Targets.

First established in the 2010 RTP, the 2018 RTP continues to rely on the on-going performance evaluation and monitoring process. The CMP performance measures have been updated to incorporate the MAP-21/FAST Act measures. Multimodal performance measures provide Metro the ability to monitor transportation system performance specific to the CMP network using observed data. Section 8.5 in Chapter 8 of the 2018 RTP describes data collection, tools and research activities necessary to support Metro’s efforts to fulfill its transportation performance measurement and reporting responsibilities.

The region’s federal MAP-21 and FAST Act performance measures and targets are for these categories:

- Safety
- National Highway System Asset Management
- National Highway System Performance
- National Freight Movement on the Interstate System
- Congestion Mitigation and Air Quality Program
- Transit Asset Management

The National Highway System Performance and the National Freight Movement on the Interstate System are the categories that relate to freight performance measures and targets. For information on the other performance measures categories see Appendix L of the 2018 RTP.
The Regional 2020 and 2022 performance targets in this section do not set regional policy for the RTP. Instead they are solely for the purpose of meeting MAP-21 and FAST Act requirements. They provide useful system performance information to satisfy federal monitoring and reporting requirements and inform the next update to the RTP. The targets were developed in coordination with the Transportation Policy Alternatives Committee (TPAC), the Oregon Department of Transportation, TriMet, South Metro Area Regional Transit (SMART), C-TRAN and the SW Washington Regional Transportation Advisory Committee (RTAC). These measures, the 2017 baseline data and the targets support the region’s Congestion Management Process.

On May 17, 2018, the Oregon Transportation Commission adopted performance measures and statewide targets for pavement and bridge condition and traffic congestion and on-road mobile source emissions for the Congestion Mitigation and Air Quality Program as an amendment to the Oregon Transportation Plan for federal monitoring and reporting purposes. Tables 7 and 8 document the region’s MAP-21/FAST Act individual 2020 and 2022 performance targets for National Highway System Performance and Freight Movement on the Interstate System. Statewide targets adopted by the Oregon Transportation Commission are provided for comparison purposes for individual measures. Statewide targets adopted by the Oregon Transportation Commission are provided for comparison purposes for individual measures.

**Table 7: National Highway System Performance Targets**

<table>
<thead>
<tr>
<th>National Highway System Performance Targets</th>
<th>Regional 2017 Baseline*</th>
<th>Regional 2020 Target</th>
<th>Regional 2022 Target</th>
<th>ODOT Statewide 2022 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance measure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of person-miles traveled on the</td>
<td>43%</td>
<td>43%</td>
<td>43%</td>
<td>78%</td>
</tr>
<tr>
<td>Interstate System that are reliable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of person-miles traveled on the</td>
<td>66%</td>
<td>66%</td>
<td>66%</td>
<td>78%</td>
</tr>
<tr>
<td>non-Interstate NHS that are reliable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


**Table 8: Freight Movement on the Interstate System – Freight Reliability Targets**

<table>
<thead>
<tr>
<th>Freight Movement on the Interstate System – Freight Reliability Targets</th>
<th>Regional 2017 Baseline*</th>
<th>Regional 2020 Target</th>
<th>Regional 2022 Target</th>
<th>ODOT Statewide 2022 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance measure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Truck Travel Time Reliability (TTTR) Index</td>
<td>3.17</td>
<td>3.10</td>
<td>3.10</td>
<td>1.45</td>
</tr>
</tbody>
</table>


Earlier in this chapter, Table 6 defines the federal performance measures that are in Table 7 and 8. Generally truck travel time reliability is a ratio that compares of how long it takes to travel along a roadway route during a certain time of day using many samples, and comparing each sample to how long it would take to travel that route at that time of day.
under normal conditions (50th percentile of all samples). Higher frequencies of truck travel times with a high level of variability from the norm, causes the ratio or index to go up and means higher unreliability. More detail on the methodology for these performance measures is provided in footnotes 26 and 27.

Metro expects to review the regional targets for National Highway System Performance (Table 7), Freight Movement on the Interstate System (Table 8) and the Congestion Mitigation and Air Quality Program as part of the Regional Mobility Policy update identified in Chapter 8 of the 2018 RTP and later on in this section of the Regional Freight Strategy. The review will determine whether adjustments to the 2022 regional targets are warranted. Metro and ODOT will initiate the Regional Mobility Policy update in 2019 in collaboration with other regional partners. The review of performance targets will be coordinated with the Transportation Policy Alternatives Committee (TPAC), ODOT, TriMet, SMART, C-TRAN and the SW Washington Regional Transportation Advisory Committee (RTAC).

10.3 Freight System Evaluation Measures

Truck Vehicle Hours of Delay (VHD) on all facilities
This measure uses the Metro travel forecasting model to calculate the hours of truck delay for all roadway facilities within the Metro Planning Area (MPA) during 2015 and various future year scenarios. The calculations have been made for the average weekday during the following times of day: 7AM to 9AM (morning peak), 1PM to 3PM, and 4PM to 6PM (evening peak). The 1PM to 3PM time-slot was chosen as the afternoon period that trucks travel in to avoid peak hours of congestion.

Findings: Between 2015 and 2040, truck delay on all facilities within the MPA increases significantly for all investment scenarios during all three time periods. However, when compared with the 2040 No Build both 2040 RTP investment scenarios show a slower pace of growth in delay in each travel period. In the two-hour mid-day (1-3 PM) the 2040 Financially Constrained truck delay is 67% less than the 2040 No Build and the 2040 Strategic truck delay is 72% less than the 2040 No Build. In the two-hour pm peak (4-6 PM) the 2040 Financially Constrained and the 2040 Strategic truck delay is less than the than 2040 No Build by 27% and 30%, respectively.

Truck Vehicle Hours of Delay (VHD) on the Regional Freight Network
This measure uses the Metro travel forecasting model to calculate the hours of truck delay for just the roadways on the Regional Freight Network map within the Metro Planning Area (MPA), during 2015 and various future year scenarios. Once again, the calculations have been made for the average weekday during the following times of day: 7AM to 9AM (morning peak), 1PM to 3PM, and 4PM to 6PM (evening peak).

Findings: Between 2015 and 2040, truck delay on the regional freight network increases significantly for all investment scenarios during all three time periods. However, when compared with the 2040 No Build, both 2040 RTP investment scenarios show a slower pace of growth in delay in each travel period. In the two-hour mid-day (1-3 PM) the 2040
Financially Constrained truck delay is 67% less than the 2040 No Build and the 2040 Strategic truck delay is 72% less than the 2040 No Build. In the two-hour pm peak (4-6 PM) the 2040 Financially Constrained and the 2040 Strategic truck delay is less than than 2040 No Build by 29% and 32%, respectively.

*(See 2018 RTP - Chapter 7 Measuring Outcomes - for more detail)*

**Cost of Truck VHD on all facilities and on the Regional Freight Network**

This measure uses the Truck VHD numbers that were calculated for both all roadway facilities and for just the Regional Freight Network, and factors them up by two different values of time for trucks, to obtain the cost of truck delay. The value of time factor for medium trucks is $28.20 per hour and represents 35% of the truck fleet. The value of time factor for heavy trucks is $30.72 per hour and represents 65% of the truck fleet.

**Findings:** In the 2040 No Build, the cost of delay on the regional freight network increases almost four fold during the two-hour pm peak compared to the 2015 Base Year. For the 2040 No Build, the cost of delay on the regional freight network increases almost 15 fold during the two-hour mid-day period. However, implementation of the 2040 RTP Federal Priorities or the 2040 Investment Strategy results in a 67%-72% decrease in the cost of delay for the mid-day peak period compared to the 2040 No Build strategy. For the two-hour pm peak travel period the 2040 RTP Federal Priorities or 2040 Investment Strategy decrease the cost of delay by 29%-32% compared to the 2040 No Build.

*(See 2018 RTP - Chapter 7 Measuring Outcomes - for more detail)*

**Truck travel times between major freight origins and destinations**

This measure evaluates the one hour mid-day (12-1 PM), mid-day for trucks (2-3 PM) and PM peak (5-6 PM) truck travel times for 24 routes (one for each mobility corridor) that use the regional freight network, and start and/or end at a major industrial site (rail yard, intermodal facility, major industrial site, etc.). The truck travel times are calculated using the regional travel model for the 2015 Base, the 2027 No Build, the 2027 Constrained, the 2040 No Build, the 2040 Financially Constrained, and the 2040 Strategic. The findings below do not include a comparison of truck travel times for all 24 routes, and focuses on four major freeway/interstate routes in the region: I-5 (north of the central city), I-5 (south of the central city), I-84 (east of I-205) and US 26/Sunset Highway.

**Findings:** The following modeled results for major freeways are for the percent reduction in truck travel time for the 2040 Financially Constrained and 2040 Strategic compared to the 2040 No Build:

- CEID to downtown Vancouver (using I-5) CBD: 12-1 PM = 20-21% less; 2-3 PM = 18-19% less
- CEID to downtown Vancouver (using I-5) Vancouver CBD: 5-6 PM = 23-24% less
- I-5 @Morrison Br. to Tualatin Industrial: 12-1 PM = 7% less; 2-3 PM = 2-3% less
- I-5 @Morrison Br. to Tualatin Industrial: 5-6 PM = 2% less
Due to the Columbia River Crossing/I-5 capacity project and the I-5 Rose Quarter project, truck travel times between the Central Industrial Eastside District (CEID) and downtown Vancouver Washington improve by 18 – 24 % over the 2040 No Build scenario. However, for the other 3 major freeway corridors in the region (I-5 south, I-84 east of I-205 and US26 west of Hillsboro) the truck travel times stay virtually the same or have only a slight reduction (3-7%) for some off-peak travel times.

(See 2018 RTP - Chapter 7 Measuring Outcomes - for more detail)

Refinement of the Regional Mobility Policy
The U.S. Department of Transportation issued new regulations (through MAP-21 and the FAST Act) for states and Metropolitan Planning Organizations that will require greater monitoring of mobility on the freeway system and setting targets for system performance. While these new requirements differ somewhat from the current mobility policy for the region, the approach is similar, with a focus on the throughway system.

To meet the new federal mandate and the growing challenges on the freeway system, ODOT and Metro propose to work in partnership after the completion of the 2018 RTP (2019–20) on a refinement to our regional mobility policy. This will allow the refinement work to build on a rich data set and updated policy framework from the RTP with the goal of better informing system management and investments in the region.

The mobility policy is principally an issue for the freeways, state highways and on the region’s principal arterial system, which are an important part of the regional freight network.

(See section 8.2.3.1 Regional Mobility Policy Update in the 2018 RTP for more detailed information)

Freight Evaluation Measures and Refinement of Regional Mobility Policy
Additional freight measures that address freight mobility may be developed that reflect the refinement of the Regional Mobility Policy. One of the expected outcomes of the Regional Mobility Policy refinement is “a mobility corridor-based strategy for managing congestion on regional arterial streets while improving safety, improving transit speed and reliability, completing gaps in pedestrian and bicycle facilities and supporting regional and local land use plans.” These outcomes should allow for the development of freight evaluation
measures on the effectiveness managing congestion, achieving better reliability, and improving safety on the regional freight network.

**Freight Mobility and Industrial Access Measure**
This measure was developed and tested, but not fully implemented or evaluated. The intent was to measure the number of trucks that are coming from or going to freight intermodal facilities or industrial land within each of the Regional Mobility Corridors, and determine the hours of truck delay they are experiencing on the regional freight network. The times of day that were measured include the AM peak (7-9 AM), the mid-day for trucks (1-3 PM) and the PM peak (4-6 PM). The two areas chosen to test were the Tualatin and Sherwood Industrial Area off Tualatin-Sherwood Road (in mobility corridor 11); and the Marine Terminals 5 and 6, and the rail yards off Marine Drive (in mobility corridor 17). This measure was developed and tested as part of the 2018 RTP Systems Evaluation work.

The process consisted of 1) choosing two industrial areas, 2) calculating the number of trucks at certain times of day (modeled) that are coming into or leaving these area (zones); and 3) measuring the hours of delay (modeled) that these trucks are experiencing (within the region) at these times of day as they travel to and from these areas. This measure will be more fully developed as part of the next RTP update (due in 2023).

*Findings:* The results of the testing were incomplete and inconclusive due to it being limited to two areas with freight intermodal facilities/rail yards or industrial land. Intermodal Facilities and rail yards are not the only places that attract large numbers of freight trucks. According to the truck model, in 2015 the Tualatin and Sherwood Industrial Area generates about 30 percent more truck trips (regardless of time period) than does the North Portland industrial area that includes Marine Terminals 5 and 6, and two rail yards. By 2040, that difference increases to about 33 percent more truck trips regardless of time period.
ACRONYMS

BNSF – Burlington Northern Santa Fe
CBOS – Corridors Bottleneck Operations Study
CEID – Central Eastside Industrial District
CMP – Congestion Management Process
DEQ – Department of Environmental Quality
EB – Eastbound
FAST Act – Fixing America’s Surface Transportation Act
FHWA – Federal Highway Administration
GPS – Global Positioning System
HVAC – Heating, Ventilation, Air Conditioning
ICTSI – International Container Terminal Service Inc.
ITS – Intelligent Transportation Systems
JPACT – Joint Policy Advisory Committee on Transportation
MAP-21 – Moving Ahead for Progress in the 21st Century Act
MCTD – Motor Carrier Transportation Division
MPA – Metropolitan Planning Area
MPAC – Metro Policy Advisory Committee
MPH – Miles per hour
MPO – Metropolitan Planning Organization
MTAC – Metro Technical Advisory Committee
MTIP – Metropolitan Transportation Improvement Plan
NB – Northbound
NHS – National Highway System
ODOT – Oregon Department of Transportation
OFAC – Oregon Freight Advisory Committee
PDX – Portland International Airport
RFGM – Regional Freight and Goods Movement
RFWG – Regional Freight Work Group
RRR – Reduction Review Route
RTP – Regional Transportation Plan
RTO – Regional Travel Options
SB – Southbound
TAZ – Transportation Analysis Zones
TDM – Transportation Demand Management
UP – Union Pacific
WB – Westbound
GLOSSARY OF TERMS

Accessibility – The ability or ease to reach desired goods, services, activities and destinations with relative ease, within a reasonable time, at a reasonable cost and with reasonable choices. Many factors affect accessibility (or physical access), including mobility, the quality, cost and affordability of transportation options, land use patterns, connectivity of the transportation system and the degree of integration between modes. The accessibility of a particular location can be evaluated based on distances and travel options, and how well that location serves various modes. Locations that can be accessed by many people using a variety of modes of transportation generally have a high degree of accessibility.

Arterial Street – A class of street. Arterial streets interconnect and support the throughway system. Arterials are intended to provide general mobility for travel within the region. Correctly sized arterials at appropriate intervals allow through trips to remain on the arterial system thereby discouraging use of local streets for cut-through travel. Arterial streets link major commercial, residential, industrial and institutional areas. Major arterials serve longer distance through trips and serve more of a regional traffic function. Minor arterials serve shorter, more localized travel within a community. As a result, major arterials usually carry more traffic than minor arterials. Arterial streets are usually spaced about one mile apart and are designed to accommodate bicycle, pedestrian, truck and transit travel.

Bicycle – A vehicle having two tandem wheels, a minimum of 14 inches in diameter, propelled solely by human power, upon which a person or persons may ride. A three-wheeled adult tricycle is considered a bicycle. In Oregon, a bicycle is legally defined as a vehicle. Bicyclists have the same right to the roadways and must obey the same traffic laws as the operators of other vehicles.

Bicycle facilities – A general term denoting improvements and provisions made to accommodate or encourage bicycling, including parking facilities, all bikeways and shared roadways not specifically designated for bicycle use.

Bike lane – A portion of a roadway that has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicyclists.

Rail branch lines – Non-Class I rail lines, including short line or branch lines.

Capacity – A transportation facility’s ability to accommodate a moving stream of people or vehicles in a given place during a given time period. Increased capacity can come from building more streets or throughways, adding more transit service, timing traffic signals, adding turn lanes at intersections or many other sources.

Central city – Downtown Portland and adjacent areas (like Lloyd District) within the city of Portland.
**Collector street** – A class of street. Collector streets provide both access and circulation between residential, commercial, industrial and agricultural community areas and the arterial system. As such, collectors tend to carry fewer motor vehicles than arterial streets, with reduced travel speeds. Collector streets are usually spaced at half-mile intervals, midway between arterial streets. Collectors may serve as bike, pedestrian and freight access routes, providing local connections to the arterial street network and transit system.

**Commute** – Regular travel between home and a fixed location (e.g., work, school).

**Commuter rail** – Short-haul rail passenger service operated within and between metropolitan areas and neighboring communities. This transit service operates in a separate right-of-way on standard railroad tracks, usually shared with freight use. The service is typically focused on peak commute periods but can be offered other times of the day and on weekends when demand exists and where rail capacity is available. The stations are typically located one or more miles apart, depending on the overall route length. Stations offer infrastructure for passengers, bus and LRT transfer opportunities and parking as supported by adjacent land uses. See also Inter-city rail.

**Complete streets** – A transportation policy and design approach where streets are designed, operated and maintained to enable safe, convenient and comfortable travel and access for users of all ages and abilities, regardless of their mode of transportation.

**Connectivity** – The degree to which the local and regional street, pedestrian, bicycle, transit and freight systems in a given area are interconnected.

**Congestion** – A condition characterized by unstable traffic flows that prevents movement on a transportation facility at optimal legal speeds. Recurrent congestion is caused by constant excess volume compared with capacity. Nonrecurring congestion is caused by incidents such as bad weather, special events and/or traffic accidents.

**Corridors (2040 design type)** – A type of land use that is typically located along regional transit routes and arterial streets, providing a place for somewhat higher densities than is found in 2040 centers. These land uses should feature a high-quality pedestrian environment and convenient access to transit. Typical new developments would include row houses, duplexes and one to three-story office and retail buildings, and average about 25 persons per acre. While some corridors may be continuous, narrow bands of higher-intensity development along arterial streets, others may be more nodal, that is a series of smaller centers at major intersections or other locations along the arterial that have high quality pedestrian environments, good connection to adjacent neighborhoods and transit service.

**Deficiency** – Capacity or design constraints that limit, but do not prohibit the ability to travel by a given mode, or meet certain thresholds defined in the Regional Transportation Plan. Examples include locations where throughway capacity is less than six through lanes.
and arterial street capacity less than 4 lanes, or that have poor or substandard design features; at-grade rail crossings; height restrictions; bike and pedestrian connections that contain obstacles (e.g., missing curb ramps, distances greater than 330 feet between pedestrian crossings, absence of pedestrian refuges, sidewalks occluded by utility infrastructure, high traffic volumes and complex traffic environments); transit overcrowding or schedule unreliability and high crash locations).

**Delay** – The additional travel time required by all travelers, as measured by the time to reach destinations at posted speed limits (free-flow speed) versus traveling at a slower congested speed. Delay can be expressed in several different ways, including total delay in vehicle–hours, total delay per vehicle miles traveled (VMT) and share of delay by time period, day of week or speed range.

**Employment areas** – Areas of mixed employment that include various types of manufacturing, distribution and warehousing uses, and may include commercial and retail development. Retail uses should primarily serve the needs of the people working or living in the immediate employment area. Exceptions to this general policy can be made only for certain areas indicated in a functional plan.

**Facility** – The fixed physical assets (structures) enabling a transportation mode to operate (including travel, as well as the loading and unloading of passengers). This includes streets, throughways, bridges, sidewalks, bikeways, transit stations, bus stops, ports, air and marine terminals and rail lines.

**Federal Highway Administration (FHWA)** – The federal agency responsible for administering roadway programs and funds. The FHWA implements transportation legislation approved at the congressional level that appropriates all federal funds to states and local governments.

**Freeway** – A design for a Throughway in which all access points are grade separated. Directional travel lanes usually separated by a physical barrier, and access and egress points are limited to on–and off–ramp locations or a very limited number of at–grade intersections.

**Freight intermodal facility** – An intercity facility where freight is transferred between two or more freight modes (e.g., truck to rail, rail to ship, truck to air).

**Freight modes** – Freight modes are the means by which freight achieves mobility. These modes fall into five basic types: road (by truck), rail, pipeline, marine (by ship or barge) and air.

**Freight mobility** – The efficient movement of goods from point of origin to destination.
Freight rail – A freight train that is a group of freight cars hauled by one or more locomotives on a railway, transporting cargo all or some of the way between the shipper and the intended destination.

High-occupancy vehicle (HOV) – A vehicle carrying more than two passengers with the exception of motorcycles.

Highway – A design for a Throughway in which access points are a mix of separate and at-grade.

Industrial areas – Areas set aside for industrial activities. Supporting commercial and related uses may be allowed, provided they are intended to serve the primary industrial users. Residential development and retail users whose market area is larger than the industrial area are not considered supporting uses.

Intelligent transportation systems (ITS) – The application of a broad range of advanced communications technologies that are integrated with transportation infrastructure and vehicles to improve the efficiency and safety of transportation systems. ITS can include both vehicle-to-vehicle communication (which allows cars to communicate with one another to avoid crashes) and vehicle-to-infrastructure communication (which allows cars to communicate with the roadway) to identify congestion, crashes or unsafe driving conditions, manage traffic flow, or provide alternate routes to travelers.

Intermodal connector – A road that provides connections between major rail yards, marine terminals, airports, and other freight intermodal facilities; and the freeway and highway system (the National Highway System).

Intermodal facilities – A transportation element that allows passenger and/or freight connections between modes of transportation. Examples include airports, rail stations, marine terminals, and rail yards that facilitate the transfer of containers or trailers. See also passenger intermodal facility and freight intermodal facility definitions.

Local jurisdiction – For the purpose of this plan, this term refers to a city or county within the Metro boundary.

Local streets or roads – Local streets primarily provide direct access to adjacent land. While Local streets are not intended to serve through traffic, the aggregate effect of local street design impacts the effectiveness of the Arterial and Collector system when local travel is restricted by a lack of connecting routes, and local trips are forced onto the Arterial street network. In the urban area, local roadway system designs often discourage “through traffic movement.” Regional regulations require local street connections spaced no more than 530 feet in new residential and mixed use areas, and cul-de-sacs are limited to 200 feet in length. These connectivity requirements ensure that a lack of adequate local street connections does not result in the arterial system becoming congested. While the focus for
local streets has been on motor vehicle traffic, they are developed as multi-modal facilities that accommodate bicycles, pedestrians and sometimes transit.

**Main line rail** – Class I rail lines (e.g., Union Pacific and Burlington Northern/Santa Fe).

**Main roadway routes** – Designated freights routes that are freeways and highways that connect major activity centers in the region to other areas in Oregon or other states throughout the U.S., Mexico and Canada.

**Marine facilities** – A facility where freight is transferred between water-based and land-based modes.

**Metropolitan Planning Organization (MPO)** – A regional policy body, required in urbanized areas with populations more than 50,000 and designated by the governor of the state. MPOs are responsible, in cooperation with the state and other transportation providers for carrying out the metropolitan transportation planning requirements of federal highway and transit legislation. Oregon currently has eight MPOs covering the metropolitan areas of Portland, Salem-Keizer, Corvallis, Eugene-Springfield, Medford-Ashland, Bend, Albany area, and Middle Rogue.

**Mobility** – The ability to move people and goods to destinations efficiently and reliably.

**Mobility corridor** – Mobility corridors represent subareas of the region and include all regional transportation facilities within the subarea as well as the land uses served by the regional transportation system. This includes freeways and highways and parallel networks of arterial streets, regional bicycle parkways, high capacity transit, and frequent bus routes. The function of this network of integrated transportation corridors is metropolitan mobility – moving people and goods between different parts of the region and, in some corridors, connecting the region with the rest of the state and beyond. This framework emphasizes the integration of land use and transportation in determining regional system needs, functions, desired outcomes, performance measures, and investment strategies.

**Mode** – A type of transportation distinguished by means used (e.g., such as walking, bike, bus, single- or high-occupancy vehicle, bus, train, truck, air, marine).

**Mode choice** – The ability to choose one or more modes of transportation.

**Multimodal** – The movement of people or goods by more than one mode.

**National Highway System (NHS)** – Title 23 of the U.S. Code section 103 states that the purpose of the NHS is to provide an interconnected system of principal routes that serve major population centers, international border crossings, ports, airports, public transportation facilities, intermodal transportation facilities, major travel destinations, meet national defense requirements, and serve interstate and inter-regional travel. Facilities included in the NHS are of regional significance.
Network – Connected routes forming a cohesive system.

Objective – An intermediate, short-term desired outcome or result that is measurable and must be realized within the timeframe of the RTP plan period to reach a longer-term goal.

Off-peak hours – The hours outside of the highest motor vehicle traffic period, generally between 9 a.m. and 3 p.m. and between 6 p.m. and 7 a.m.

Oregon Transportation Commission – The Oregon Transportation Commission is a five-member governor-appointed government agency that manages the state highways and other transportation in the state of Oregon, in conjunction with the Oregon Department of Transportation.

Oregon Transportation Plan – The official statewide intermodal transportation plan that is developed through the statewide transportation planning process by ODOT.

Passenger car equivalent – Passenger Car Equivalent (PCE) is a metric used in Transportation Engineering, to assess traffic-flow rate on a highway. A PCE is essentially the impact that a mode of transport has on traffic variables compared to a single car.

Passenger intermodal facilities – Facilities that accommodate or serve as transfer points to interconnect various transportation modes for the movement of people. Examples include Portland International Airport, Union Station, Oregon City Amtrak station and inter-city bus stations.

Passenger rail – Inter-city passenger rail is part of the state transportation system and extends from the Willamette Valley north to British Columbia. Amtrak already provides service south to California, east to the rest of the continental United States and north to Canada. It is a transit system that operates, in whole or part, on a fixed guide-way. These systems should be integrated with other transit services within the metropolitan region with connections at passenger intermodal facilities.

Passenger train – A railroad train for only passengers, rather than goods. Amtrak is the company that controls the railroads that carry passengers in the U.S.

Passenger vehicles – Motor vehicles with at least four wheels, used for the transport of passengers, and comprising no more than eight seats in addition to the driver's seat. Light commercial vehicles are motor vehicles with at least four wheels, used for the carriage of goods.

Peak period or hours – The period of the day during which the maximum amount of travel occurs. It may be specified as the morning (A.M.) or afternoon or evening (P.M.) peak. Peak periods in the Portland metropolitan region are currently generally defined as from 7–9 AM and 4–6 PM.
**Pedestrian** – A person traveling on foot, in a wheelchair or in another health-related mobility device.

**Pedestrian facility** – A facility provided for the benefit of pedestrian travel, including walkways, protected street crossings, crosswalks, plazas, signs, signals, pedestrian scale street lighting and benches.

**Performance measures** – Also called indicators. A measure of how well the transportation system is performing that is used to evaluate the success of the objective with quantitative or qualitative data and provide feedback in the plan’s decision-making process. Some measures can be used to predict the future as part of an evaluation process using forecasted data, while other measures can be used to monitor changes based on actual empirical or observed data. In both cases, they can be applied at a system-level, corridor-level and/or project level, and provide the planning process with a basis for evaluating alternatives and making decisions on future transportation investments. They can also be used to monitor performance of the plan in between updates to evaluate the need for refinements to policies, investment strategies or other elements of the plan.

**Person-Trip** – Trip made by a person from one location to another, whether as a driver, bicyclist, passenger or pedestrian.

**Principal arterial** – These facilities form the backbone of the motor vehicle network. These routes connect over the longest distance and are spaced less frequently than other Arterials or Collectors. These facilities form the primary connections between the central city, regional centers, industrial areas and intermodal facilities, as well as between neighboring cities and the metro region. Principal arterials generally span several jurisdictions and often are designated to be of statewide importance and serve as major freight routes.

**Project development** – A phase in the transportation planning process during which a proposed project undergoes a more detailed analysis of the project’s social, economic and environmental impacts and various project alternatives. After a project has successfully passed through this phase, it may move forward to right-of-way acquisition and construction phases. Project development activities include: Environmental Assessment (EA)/Environmental Impact Statement (EIS) work, Design Options Analysis (DOA), management plans, and transit Alternatives Analysis (AA).

**Ramp meter or metering** – A traffic signal used to regulate the flow of vehicles entering the freeway. Ramp meters smooth the merging process resulting in increased freeway speeds and reduced crashes. Ramp meters can be automatically adjusted based on traffic conditions.

**2040 Regional Centers** – Compact, specifically-defined areas where higher density growth and a mix of intensive residential and commercial land uses exists or is planned. Regional centers are to be supported by an efficient, transit-oriented, multi-modal
transportation system. Examples include traditional centers, such as downtown Gresham, and new centers such as Gateway and Clackamas Town Center.

**Regional Freight network** – Applies the regional freight concept on the ground to identify the transportation networks and freight facilities that serve the region and state’s freight mobility needs.

**Regional Transportation Plan (RTP)** – A long-range transportation plan for the metropolitan planning area covering a planning horizon of at least 20 years. Usually RTPs are updated every five years through the metropolitan transportation planning process. The plan identifies and analyzes transportation needs of the metropolitan region and creates a framework for project priorities.

**Regional transportation system** – The regional transportation system is identified on the regional transportation system maps in the Regional Transportation Plan. The system is limited to facilities of regional significance generally including regional arterials and throughways, high capacity transit and regional transit systems, regional multi-use trails with a transportation function, bicycle and pedestrian facilities that are located on or connect directly to other elements of the regional transportation system, air and marine terminals, as well as regional pipeline and rail systems.

**Regionally Significant Industrial Area (RSIA)** – 2040 land use designation; RSIAs are shown on Metro’s 2040 map. Industrial activities and freight movement are prioritized in these areas.

**Reliability** – This term refers to consistency or dependability in travel times, as measured from day to day and/or across different times of day. Variability in travel times means travelers must plan extra time for a trip.

**Reload facility** – An intermediary facility where freight is reloaded from one land–based mode to another.

**Roadway connectors** – Roads that connect other freight facilities, industrial areas, and 2040 centers to a main roadway route.

**Single–occupancy vehicle (SOV)** – Motor vehicles occupied by the driver only.

**Stakeholders** – Individuals and organizations with an interest in or who are affected by the transportation planning process, including federal, state, regional and local officials and jurisdictions, institutions, community groups, transit operators, freight companies, shippers, non–governmental organizations, advocacy groups, the general public, and people who have traditionally been underrepresented.

**State Highways** – In Oregon, is a network of roads that are owned and maintained by the Highway Division of the Oregon Department of Transportation (ODOT), including Oregon’s portion of the Interstate Highway System.
State Transportation Improvement Program – The funding and scheduling document for major street, highway and transit projects in Oregon for a four–year period. The document is produced by ODOT, consistent with the Oregon Transportation Plan (the statewide transportation plan) and planning processes as well as metropolitan transportation plans, MTIPs, and processes.

Street – A generally gravel or concrete– or asphalt–surfaced facility. The term collectively refers to arterial, collector and local streets that are located in 2040 mixed–use corridors, industrial areas, employment areas and neighborhoods. While the focus for streets has been on motor vehicle traffic, they are designed as multi–modal facilities that accommodate bicycles, pedestrians and transit, with an emphasis on vehicle mobility and special pedestrian infrastructure on transit streets.

Sustainable – A method of using a resource such that the resource is not depleted or permanently damaged.

Sustainability – Using, developing and protecting resources in a manner that enables people to meet current needs and provides that future generations can meet future needs, from the joint perspective of environmental, economic and community objectives. This definition of sustainability is from the 2006 Oregon Transportation Plan and ORS 184.421(4). The 2001 Oregon Sustainability Act and 2007 Oregon Business Plan maintain that these principles of sustainability can stimulate innovation, advance global competitiveness and improve quality of life in communities throughout the state.

System management – A set of strategies for increasing travel flow on existing facilities through improvements such as ramp metering, traffic signal synchronization and access management.

Target – A numerical goal or stated direction to be achieved for which quantifiable or directional targets may be set, assigning a value to what the RTP is trying to achieve. Targets are expressed in quantitative terms and provide an important measure of progress toward achieving different goals within a timeframe specified for it to be achieved.

Throughways – Limited–access facilities that serve longer–distance motor vehicle and freight trips, providing for interstate, intrastate and cross–regional travel. Throughways are classified as a principal arterial and connect major activity centers within the region to one another and to destinations outside the region.

Traffic – Movement of motorized vehicles, non–motorized vehicles and pedestrians on transportation facilities. Often traffic levels are expressed as the number of units moving over or through a particular location during a specific time period.

Traffic incident management – Planned and coordinated processes followed by state and local agencies to detect, respond to, and remove traffic incidents quickly and safely in order to keep highways flowing efficiently.
Traffic management – Strategies that improve transportation system operations and efficiency, including ramp metering, active traffic management, traffic signal coordination and real-time traveler information regarding traffic conditions, incidents, delays, travel times, alternate routes, weather conditions, construction, or special events.

Traffic signal progression – A process by which a number of traffic signals are synchronized to create the efficient progression of vehicles.

Transportation demand – The quantity of transportation services desired by users of the transportation system.

Transportation demand management (TDM) – The application of a set of strategies that affect when, where and how much people travel in order to make more efficient use of transportation infrastructure and services. Strategies include offering other modes of travel such as walking, bicycling, ride-sharing and vanpool programs, car sharing, education such as individualized marketing, policies, regulations and other combinations of incentives and disincentives that are intended to reduce drive alone vehicle trips on the transportation network.

Transportation Improvement Program (TIP) – The 4-year, specific multimodal program of regional transportation improvements for highways, transit and other travel modes. The TIP consists of projects drawn from the Regional Transportation Plan financially constrained system as well as local plans and programs.

Transportation system – Various transportation modes or facilities (aviation, bicycle and pedestrian, throughway, street, pipeline, transit, rail, water transport) serving as a single unit or system.

Transportation system management (TSM) – A set of strategies for increasing travel flow on existing facilities through improvements such as ramp metering, traffic signal synchronization, incident response and access management.

Transportation system plan (TSP) – The transportation element of the comprehensive plan for one or more transportation facilities that is planned, developed, operated and maintained in a coordinated manner to supply continuity of movement between modes, and between geographic and jurisdictional areas. The TSP supports the development patterns and land uses contained in adopted community plans. The TSP includes a comprehensive analysis and identification of transportation needs associated with adopted land use plans. The TSP complies with Oregon’s Transportation Planning Rule, as described in statewide Planning Goal 12.

Travel time – The measure of time that it takes to reach another place in the region from a given point for a given mode of transportation. Stable travel times are a sign of an efficient transportation system that reliably moves people and goods through the region.
**Travel time reliability** – This term refers to consistency or dependability in travel times, as measured from day to day and/or across different times of day. Variability in travel times means travelers must plan extra time for a trip.

**Trip** – A one-way movement of a person or vehicle between two points. A person who leaves home on one vehicle, transfers to a second vehicle to arrive at a destination, leaves the destination on a third vehicle and has to transfer to yet another vehicle to complete the journey home has made four unlinked passenger trips.

**Truck terminal** – A facility that serves as a primary gateway for commodities entering or leaving the metropolitan area by road.

**Urban Growth Boundary** – The politically defined boundary around an urban area beyond which no urban improvements may occur. In Oregon, UGBs are defined so as to accommodate projected population and employment growth within a 20-year planning horizon. A formal process has been established for periodically reviewing and updating the UGB so that it meets forecasted population and employment growth.

**Volume-to-capacity (v/c) ratio** – This is a measure of potential roadway capacity. A ratio expressing the relationship between the existing or anticipated volume of traffic on a roadway and the designed capacity of the facility. V/C standards set ratios as a minimum operating standard. Deficiencies can be addressed by lowering traffic volumes through demand management, transit, etc. or by increasing capacity through access management, signal timing, adding lanes, etc., or a combination of methods.

**Vehicle Miles Traveled (VMT)** – A measurement of the total miles traveled by all vehicles for a specified time period. For purposes of this definition, "vehicles" include automobiles, light trucks, and other similar vehicles used for the movement of people. The definition does not include buses, heavy trucks and trips that involve commercial movement of goods. For regional planning purposes, VMT generally includes trips with an origin and a destination within the MPA boundary and excludes pass through trips (i.e., trips with a beginning and end point outside of the MPA) and external trips (i.e., trips with a beginning or end point outside of the MPA boundary). VMT is often estimated prospectively through the use of metropolitan area transportation models.
APPENDICIES
### 2018 RTP Freight Benefit Projects and Programs

Projects are listed alphabetically by County and nominating agency.

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<tbody>
<tr>
<td>Freight</td>
<td>Clackamas County</td>
<td>Milwaukie</td>
<td>Milwaukie</td>
<td>11624</td>
<td>Local Street Improvements in Tacoma Station Area</td>
<td>Location-specific</td>
<td>Location-specific</td>
<td>Construct street improvements on Stubb St, Beta St, Ochoco St, Hanna Harvester Dr, and Mailwell Dr. (TSAP). Street improvements will improve connectivity to equity priority areas.</td>
<td>5,600,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Freight</td>
<td>Clackamas County</td>
<td>West Linn</td>
<td>TBD</td>
<td>12090</td>
<td>Willamette Falls Locks Repair Project</td>
<td>Willamette Falls Locks</td>
<td>Willamette Falls Locks</td>
<td>Capital improvements needed to repair and reopen the Willamette Falls Locks to support freight transportation, tourism and recreation activities. The project includes structural and electrical repairs, seismic upgrades, and other elements.</td>
<td>20,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Freight</td>
<td>Clackamas County</td>
<td>Wilsonville</td>
<td>Wilsonville</td>
<td>11764</td>
<td>Boones Ferry Road Extension</td>
<td>Commerce Circle</td>
<td>Ridder Road</td>
<td>Construct 3-lane section with bike lanes and sidewalk</td>
<td>2,100,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10446</td>
<td>181st @ Burnside: Optimize Intersection, Improve Transit Design</td>
<td>181st/Burnside</td>
<td>181st/Burnside</td>
<td>Optimize intersection operation. Transit/Enhanced Transit Corridor supportive project.</td>
<td>1,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10445</td>
<td>181st @ Glisan: Intersection Improvements</td>
<td>181st/Glisan</td>
<td>181st/Glisan</td>
<td>Optimize intersection w/signal upgrades and turn radii improvements.</td>
<td>1,107,505</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10495</td>
<td>181st @ Halsey: Improve Intersection w/Turn Lanes</td>
<td>Halsey St.</td>
<td>Halsey St.</td>
<td>add 2nd LT lane to N &amp; S legs, add RT lane to EB WB SB.</td>
<td>1,089,615</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10496</td>
<td>181st @ I-84: Study Freight Mobility and Transit Design Improvements</td>
<td>181st/I-84</td>
<td>181st/I-84</td>
<td>Freight mobility improvements subject to refinement study. Transit/Enhanced Transit Corridor supportive project.</td>
<td>1,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Multnomah County</td>
<td>Multnomah County</td>
<td>10394</td>
<td>Replace RR Over-crossing on 223rd Ave.</td>
<td>2000' north of I-84</td>
<td>223rd Ave.</td>
<td>Reconstruct railroad bridge on 223rd Ave, 2000' north of I-84 to accommodate wider travel lanes, sidewalks and bike lanes; to address safety and reduce crashes the project will use proven safety countermeasures.</td>
<td>7,441,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Multnomah County</td>
<td>Multnomah County</td>
<td>11600</td>
<td>Marine Drive at 223rd</td>
<td>Marine Drive at 223rd</td>
<td>Marine Drive at 223rd</td>
<td>Widen to accommodate freight traffic and provide bike/ped facilities</td>
<td>10,630,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
</tbody>
</table>
## 2018 Regional Freight Strategy

### 2018 RTP Freight Benefit Projects and Programs

Projects are listed alphabetically by County and nominating agency. Adopted by the Metro Council on 12/6/18.

Visit the 2018 RTP website for more information at: [oregonmetro.gov/rtp](http://oregonmetro.gov/rtp)

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<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>UPRR</td>
<td>11355</td>
<td>Barnes to Terminal 4 Rail</td>
<td>Terminal 4</td>
<td>Barnes Yard</td>
<td>Improve Rail Access to Terminal 4.</td>
<td>4,543,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>UPRR</td>
<td>11652</td>
<td>Bonneville Rail Yard Build Out</td>
<td>Bonneville Rail Yard</td>
<td>Bonneville Rail Yard</td>
<td>Construct two interior yard tracks at Bonneville Yard and complete the double track lead from the wye at the east end of the yard to UP Barnes Yard.</td>
<td>3,826,800</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Portland</td>
<td>10379</td>
<td>Marine Dr. Improvement Phase 2</td>
<td>BNSF grade crossing on Marine Drive</td>
<td>BNSF grade crossing on Marine Drive</td>
<td>Construct rail overcrossing on Marine Dr.</td>
<td>14,503,785</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>UPRR</td>
<td>11653</td>
<td>Ramsey Yard Utilization</td>
<td>Columbia Slough</td>
<td>Bonneville Yard</td>
<td>Connect the existing set out track along the west side of the main lead with the industrial lead near the south end to provide a location to store a unit train.</td>
<td>1,807,100</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Portland</td>
<td>11659</td>
<td>Rivergate Blvd. Overcrossing</td>
<td>N. Lombard</td>
<td>Time Oil Road</td>
<td>Relieve a congestion point in Rivergate Industrial Area, improve rail access to Terminal 5.</td>
<td>22,263,790</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Port of Portland</td>
<td>10363</td>
<td>SW Quad Access</td>
<td>NE 33rd Ave.</td>
<td>SW Quad</td>
<td>Provide street access from 33rd Ave. into SW Quad.</td>
<td>6,290,303</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Port of Portland</td>
<td>11649</td>
<td>T2 Redevelopment</td>
<td>Terminal 2</td>
<td>Terminal 2</td>
<td>Construct rail, rail scale, and crane modernization.</td>
<td>4,783,500</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>UPRR</td>
<td>11651</td>
<td>T2 Track Reconfiguration and Siding</td>
<td>Terminal 2</td>
<td>Terminal 2</td>
<td>Construct rail loops and support siding.</td>
<td>9,460,700</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Port of Portland</td>
<td>11208</td>
<td>T4 Modernization</td>
<td>Terminal 4</td>
<td>Terminal 4</td>
<td>Renovate operation areas at T4 to create intermodal processing areas. Rail spur relocation and expansion, grain elevator demolition, wharf removal.</td>
<td>15,845,078</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Port of Portland</td>
<td>11207</td>
<td>T6 Modernization</td>
<td>Terminal 6</td>
<td>Terminal 6</td>
<td>Provide improvements to container terminal including crane electronics and stormwater improvements.</td>
<td>8,504,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Port of Portland</td>
<td>11306</td>
<td>T6 Second Entrance from Marine Drive</td>
<td>N. Bybee Lake Rd.</td>
<td>N. Pacific Gateway</td>
<td>Construct 2nd entrance from Marine Drive and internal rail overcrossing to Terminal 6.1.</td>
<td>12,756,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Port of Portland</td>
<td>11307</td>
<td>T6 Suttle Road entrance</td>
<td>Terminus of N. Suttle Road</td>
<td>Terminal 6</td>
<td>Access to the east end of Terminal 6 off the terminus of Suttle Road.</td>
<td>3,189,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>BNSF</td>
<td>11357</td>
<td>Terminal 6 Rail Support Yard Improvements</td>
<td>Terminal 6</td>
<td>Terminal 6</td>
<td>Increase Terminal 6 rail capacity.</td>
<td>10,630,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Port of Portland</td>
<td>11654</td>
<td>Time Oil Road Reconstruction</td>
<td>Lombard</td>
<td>Rivergate Boulevard</td>
<td>Reconstruct Time Oil Road</td>
<td>9,567,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Troutdale</td>
<td>11743</td>
<td>Troutdale Airport Master Plan Transportation Improvements</td>
<td>Sundial Road</td>
<td>Swigert Way/Graham Road</td>
<td>Implement transporation improvements developed as part of the Troutdale Airport Master Plan</td>
<td>$ 5,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>BNSF</td>
<td>11952</td>
<td>Columbia River Rail Bridge Improvements</td>
<td>Columbia River Rail Bridge</td>
<td>Columbia River Rail Bridge</td>
<td>Replace Existing swing span with lift span and relocate position to mid-river channel.</td>
<td>$ 35,548,800</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Portland</td>
<td>11309</td>
<td>Cully Blvd. Grade separation</td>
<td>Columbia</td>
<td>Lombard</td>
<td>Construct roadway overcrossing at NE Cully Blvd. over Kenton line.</td>
<td>$ 37,205,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>BNSF</td>
<td>11949</td>
<td>North Portland Junction: Undoing the &quot;X&quot;</td>
<td>UPRR Peninsula Junction</td>
<td>North Portland Junction</td>
<td>Eliminate the at-grade crossing of UPRR and BNSF tracks at North Portland Junction.</td>
<td>$ 33,598,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>BNSF</td>
<td>11955</td>
<td>Railroad Bridge and Track Improvements</td>
<td>Columbia Slough Rail Bridge</td>
<td>Columbia River Rail Bridge</td>
<td>Improve rail track conditions on approaches to Willamette River and Columbia River bridges to increase railroad speed and capacity.</td>
<td>$ 10,751,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Port of Portland</td>
<td>11956</td>
<td>Rivergate Columbia Slough Rail Bridge</td>
<td>Terminal 6</td>
<td>Terminal 5</td>
<td>Construct a rail bridge across Columbia Slough to provide rail connection to South Rivergate from Terminal 6.</td>
<td>$ 10,840,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>UPRR</td>
<td>11953</td>
<td>Six mph Curves Railroad Improvements</td>
<td>Steel Bridge</td>
<td>Just north of Steel Bridge</td>
<td>Realign the curves just north of the Steel Bridge to improve rail speed and capacity.</td>
<td>$ 23,600,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>BNSF</td>
<td>11353</td>
<td>West Hayden Island Rail Access</td>
<td>BNSF Rail Bridge</td>
<td>West Hayden Island</td>
<td>Advance rail-dependent development.</td>
<td>$ 3,189,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Port of Portland</td>
<td>11354</td>
<td>West Hayden Island Rail Yard</td>
<td>West Hayden Island</td>
<td>West Hayden Island</td>
<td>Advance rail development on West Hayden Island.</td>
<td>$ 10,098,500</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10218</td>
<td>Burgard-Lombard Street Improvements</td>
<td>N Burgard St &amp; Columbia Blvd</td>
<td>Burgard Viaduct</td>
<td>Construct roadway improvements, including pedestrian and bicycle facilities.</td>
<td>$ 2,635,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10375</td>
<td>Cathedral Park Quiet Zone</td>
<td>Cathedral Park UPRR Tracks, N</td>
<td>Cathedral Park UPRR Tracks, N</td>
<td>Address rail switching noise related to the Toyota operations at T-4 by improving multiple public rail crossings in the St. Johns Cathedral Park area.</td>
<td>$ 8,200,000</td>
<td>2018-2027</td>
<td>Yes</td>
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### Freight

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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>11841</td>
<td>Central Eastside Access and Circulation Improvements</td>
<td>Central Eastside</td>
<td>Central Eastside</td>
<td>Improve access and circulation in the Central Eastside by adding new signals and crossings at Hawthorne &amp; Clay ramp, Salmon &amp; Grand, Salmon &amp; MLK, Washington &amp; Grand, Washington &amp; MLK, Ankeny &amp; Sandy, 16th &amp; Irving, and modifying signals at Stark &amp; Grand, Clay &amp; Grand, and Mill &amp; MLK.</td>
<td>$5,205,879</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10331</td>
<td>Columbia Blvd / Railroad Bridge Replacement</td>
<td>N Columbia Blvd over BNSF railroad</td>
<td>N Columbia Blvd over BNSF railroad</td>
<td>Replace the existing fracture critical Columbia Blvd bridge (#078) over railroad tracks with a new structure, and perform seismic upgrades on parallel bridge (#078A).</td>
<td>$4,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10376</td>
<td>Columbia Blvd Freight Improvements: Design/Construction</td>
<td>NE 60th Ave.</td>
<td>NE 82nd Ave.</td>
<td>Construct street and intersection modifications to improve freight reliability and access to industrial properties.</td>
<td>$14,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>12004</td>
<td>Columbia Blvd Freight Improvements: Project Development</td>
<td>NE 60th Ave</td>
<td>NE 82nd Ave</td>
<td>Alternatives analysis and project development to identify preferred street and intersection modifications to improve freight reliability and access to industrial properties.</td>
<td>$1,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>11800</td>
<td>Columbia Blvd Pedestrian Overpass Replacement</td>
<td>N Columbia Blvd west of N Midway Ave</td>
<td>N Columbia Blvd west of N Midway Ave</td>
<td>Replace the pedestrian overpass near George Middle School with either an at-grade crossing or a higher overpass to enable the use of Columbia Blvd as an over-dimensional freight route.</td>
<td>$3,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>11801</td>
<td>Columbia Blvd Railroad Undercrossing Improvement</td>
<td>N Columbia Blvd at railroad bridge near I-5</td>
<td>N Columbia Blvd at railroad bridge near I-5</td>
<td>Lower the Columbia Blvd undercrossing at the UP Railroad Bridge just west of I-5 to enable the use of Columbia Blvd as an over-dimensional freight route.</td>
<td>$3,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
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### 2018 Regional Freight Strategy

#### 2018 RTP Freight Benefit Projects and Programs

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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>11570</td>
<td>Columbia/Alderwood Intersection Improvements</td>
<td>NE Columbia Blvd &amp; Alderwood Rd</td>
<td>Columbia/Alderwood</td>
<td>Improve intersection and install traffic signal at Columbia &amp; Alderwood.</td>
<td>$5,050,654</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10340</td>
<td>Cornfoot Rd Corridor Improvements</td>
<td>NE 47th Ave</td>
<td>NE Alderwood Rd</td>
<td>Improve roadway and intersections to improve freight operations. Construct a multi-use path on the north side of Cornfoot Rd to separate pedestrians and bicyclists from motor vehicle traffic. Install guardrails where needed.</td>
<td>$7,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10337</td>
<td>Marine Dr &amp; 33rd Intersection Improvements</td>
<td>Marine Dr &amp; 33rd Ave, NE</td>
<td>Marine Dr &amp; 33rd Ave, NE</td>
<td>Signalize intersection to improve freight operations.</td>
<td>$1,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>ODOT</td>
<td>11802</td>
<td>N Portland Rd over Columbia Slough Bridge Replacement</td>
<td>N. Portland Rd at Columbia Slough</td>
<td>N. Portland Rd at Columbia Slough</td>
<td>Replace the weight-restricted N. Portland Road bridge over the Columbia Slough to enable the use of N. Portland Road as an over-dimensional freight route and include a connection for the Columbia Slough Trail.</td>
<td>$7,500,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>11568</td>
<td>St. Johns Truck Strategy Phase II</td>
<td>Columbia</td>
<td>Lombard</td>
<td>Address pedestrian safety, bicycle safety and neighborhood livability impacts associated with cut-through truck traffic on N St Louis Ave and N Fessenden St. Construct pedestrian crossing safety and traffic calming improvements, such as curb extensions and median islands, as outlined in the St Johns Truck Strategy Phase II.</td>
<td>$4,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>11799</td>
<td>Suttle Rd Freight Street Improvements</td>
<td>N Portland Rd</td>
<td>T6</td>
<td>Improve Suttle Rd to meet Freight District Street standards, separate rail and truck movements, provide pedestrian access to nearby bus line, and enable future T6 entrance Port project.</td>
<td>$9,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>11871</td>
<td>Going/Greeley Interchange Improvements</td>
<td>N Going/Greeley</td>
<td>N Going/Greeley</td>
<td>Redesign Going/Greeley interchange including climbing lane on Going to improve truck movement between Swan Island, Lower Albina, and I-5.</td>
<td>$16,750,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Freight</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10244</td>
<td>Kittridge Bridge Seismic Retrofit</td>
<td>NW Kittridge/Yeon Bridge</td>
<td>NW Kittridge/Yeon Bridge</td>
<td>Retrofit existing seismically vulnerable bridge (#010) across railroad tracks to ensure emergency response and access to petroleum supplies located along the Willamette River in the event of an earthquake.</td>
<td>$15,249,213</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Freight</td>
<td>Washington County</td>
<td>Wilsonville</td>
<td>Washington County</td>
<td>10588</td>
<td>Grahams Ferry Road Improvements</td>
<td>Day Road</td>
<td>Washington/Clackamas County line</td>
<td>Widen Grahams Ferry Road to 3 lanes, add bike/pedestrian connections to regional trail system and fix (project development only) undersized railroad overcrossing.</td>
<td>$13,200,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Clackamas County</td>
<td>Clackamas County</td>
<td>Clackamas County</td>
<td>11514</td>
<td>82nd Drive/Strawberry Lane Intersection</td>
<td>82nd Dr/Strawberry Lane intersection</td>
<td>N/A</td>
<td>Improve safety at a key intersection on a high crash corridor by implementing proven safety counter measures, installing a traffic signal and turn lanes on eastbound and northbound approaches, improve ADA accessibility as necessary.</td>
<td>$1,520,870</td>
<td>2028-2040</td>
<td>Yes</td>
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<td>Roads and Bridges</td>
<td>Clackamas County</td>
<td>Clackamas County</td>
<td>Clackamas County</td>
<td>10002</td>
<td>Johnson Creek Blvd. Improvements</td>
<td>55th Ave</td>
<td>82nd Ave.</td>
<td>Implement proven safety counter measures and widen to 3 lanes with bikeways and pedestrian facilities from 55th Ave to 82nd Ave to improve safety, improving freight access to industrial area and increasing accessibility for historically marginalized communities.</td>
<td>$14,237,510</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>11763</td>
<td>Johnson Creek Blvd./79th Ave Intersection (TSAP)</td>
<td>80th Place</td>
<td>79th Ave</td>
<td>Construct new signalized intersection at the intersection of Johnson Creek Blvd and either 79th Ave or 80th Place within Clackamas County, including bike/ped improvements as necessary.</td>
<td>$2,200,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>10023</td>
<td>82nd Dr. Improvements</td>
<td>Hwy 212</td>
<td>Strawberry Lane</td>
<td>Improve safety by implementing proven countermeasure programs at known high crash corridor, widening to a consistent 4-lane cross section and include bike/ped improvements as necessary. Not including intersection improvements at Strawberry Lane.</td>
<td>$18,521,712</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>10001</td>
<td>Johnson Creek Blvd./I-205 interchange improvements</td>
<td>JCB/I-205 interchange</td>
<td>NA</td>
<td>Increase safety at interchange by implementing proven countermeasure programs at known high crash corridor, widening to a consistent 4-lane cross section and include bike/ped improvements as necessary.</td>
<td>$10,417,400</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>10041</td>
<td>162nd Ave. Extension South Rock Creek Blvd.</td>
<td>Hwy 212</td>
<td>NA</td>
<td>Extend 162nd Ave from Rock Creek Blvd to Hwy 212; construct new, 3-lane roadway with continuous left turn lane, sidewalks, bike lanes, and ADA accessibility improvements at all four approaches. Project terminates at industrial employment sector. In addition, will improve safety on a high injury corridor.</td>
<td>$5,315,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<td>Roads and Bridges</td>
<td>Clackamas County</td>
<td>Happy Valley</td>
<td>Clackamas County</td>
<td>10033</td>
<td>172nd Ave &amp; 190th Connector (Phase 1 - Design)</td>
<td>Clatsop</td>
<td>Sunnyside Rd.</td>
<td>Phase 1 design work to widen 172nd to 5 lanes; construct connector between 172nd and 190th Ave using adopted alignment; project includes bike lanes, sidewalks and continuous left turn lane; last connector in n/s freight route alternative to I-205 between I-84 and Hwy-212.</td>
<td>$4,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Clackamas County</td>
<td>Happy Valley</td>
<td>Happy Valley</td>
<td>11135</td>
<td>Rock Creek Blvd. improvements</td>
<td>Hwy. 212/224</td>
<td>177th Ave.</td>
<td>Construct new 5 lane road from Sunrise Corridor Rock Creek Interchange to 162nd Ave; Widen existing alignment of Rock Creek Blvd to five lanes from 162nd to 177th Ave. Facility improvements include continuous left turn lane, sidewalks, bike lanes and traffic signals. In addition, will improve safety on on a High Injury Corridor.</td>
<td>$23,673,010</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Clackamas County</td>
<td>Happy Valley</td>
<td>Clackamas County</td>
<td>12071</td>
<td>172nd Ave. &amp; 190th Connector (Phase 2 - Construction)</td>
<td>Clatsop Street</td>
<td>Sunnyside Road</td>
<td>Public right-of-way acquisition and construction work to widen 172nd to 5 lanes; construct connector between 172nd and 190th Ave using adopted alignment; project includes bike lanes, sidewalks and continuous left turn lane; last connector in n/s freight route alternative to I-205 between I-84 and Hwy-212.</td>
<td>$35,841,240</td>
<td>2028-2040</td>
<td>No</td>
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| Roads and Bridges       | Clackamas County | Milwaukie        | ODOT                  | 11537  | Group 4—Pedestrian Improvements at Hwy 224 | Harrison St    | Freeman Way  | • Intersection improvements at Hwy 224/37th Ave = Consolidate the two northern legs of 37th Ave and International Way into one leg at Hwy 224  
• Intersection improvements at Hwy 224/Oak St = Add left-turn lanes and protected signal phasing on Oak St approaches.  
• Study of Pedestrian Crossings on Hwy 224 = Examine alternatives for improving pedestrian crossings at five intersections along Hwy 224 (Harrison St, Monroe St, Oak St, 37th Ave, Freeman Way).  
• Intersection improvements at Hwy 224/Oak St, Hwy 224/Oak St, Hwy 224/Oak St, Hwy 224/Harrison St, Hwy 224/Monroe St = Improve pedestrian crossings.  
• Hwy 224 Crossing improvements at Oak and Washington St = Improve intersection crossing safety for bicyclists at Washington St and Oak St.  
• Intersection Improvements at Harrison St and Hwy 224 = Add left-turn lanes and protected signal phasing on Harrison St approaches. | $3,100,000          | 2028-2040        | Yes                                           |                  |
| Roads and Bridges       | Clackamas County | Milwaukie        | Milwaukie             | 10000  | Linwood/Harmony Rd / Lake Rd. Intersection | Railroad Ave / Linwood Ave / Harmony Rd Intersection | Railroad Ave / Linwood Ave / Harmony Rd / Intersection | Railroad crossing and intersection improvements based on further study of intersection operations including bikeways and pedestrian facilities to be undertaken jointly by the City of Milwaukie and the County | $21,300,000                  | 2028-2040        | Yes                                           |
## 2018 RTP Freight Benefit Projects and Programs
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<td>Roads and Bridges</td>
<td>Clackamas County</td>
<td>Milwaukie</td>
<td>ODOT</td>
<td>11623</td>
<td>Group 11—Intersection Improvements in North Industrial Area</td>
<td>Ochoco St</td>
<td>Harrison St</td>
<td>Signage and Intersection Improvements at McLoughlin Blvd and Ochoco St = Establish signage for trucks and improve intersection. (TSAP) Intersection Improvements at McLoughlin Blvd and 17th Ave = Prohibit left-turn movement from 17th Ave to northbound McLoughlin Blvd and include in Hwy 224 &amp; Hwy 99E Refinement Plan. Intersection Improvements at Main St and Mailwell Dr = Upgrade intersection turning radii to better accommodate freight movements. Projects will improve freight mobility in an equity priority area.</td>
<td>2,300,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Clackamas County</td>
<td>Oregon City</td>
<td>ODOT</td>
<td>10144</td>
<td>Hwy 99E &amp; I-205 SB Interchange Access</td>
<td>Dunes Drive</td>
<td>I-205 SB Ramp Terminus</td>
<td>Dual left turn lanes on 99E approach to SB I-205 ramp, ramp widening to accommodate approach. (Closely related to TSP D75, D76 but not actually these projects)</td>
<td>2,650,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Clackamas County</td>
<td>Oregon City</td>
<td>Oregon City</td>
<td>11544</td>
<td>Meyers Road Extension [West]</td>
<td>OR 213</td>
<td>High School Avenue</td>
<td>Construct new 3 lane roadway, sidewalks, buffered bike lanes, WB right turn lane and center turn lanes to serve adjacent Clackamas Community College &amp; underdeveloped industrial properties. (TSP D46)</td>
<td>4,500,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Clackamas County</td>
<td>Oregon City</td>
<td>ODOT</td>
<td>10119</td>
<td>OR 213 &amp; Redland, Phase 2</td>
<td>Redland Road</td>
<td>Redland Road Undercrossing</td>
<td>Add third through lane in both northbound &amp; southbound directions. This is Phase 2 of the completed Jughandle Project. (TSP D79)</td>
<td>9,800,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
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<td>Roads and Bridges</td>
<td>Clackamas County</td>
<td>Oregon City</td>
<td>ODOT</td>
<td>10140</td>
<td>OR 213 Widening</td>
<td>Clackamas Community College</td>
<td>Conway Drive</td>
<td>Add one Southbound through lane and one Northbound through lane, bike lanes, and sidewalks. (TSP D77, W31)</td>
<td>5,200,000</td>
<td>2028-2040</td>
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<td>Oregon City</td>
<td>ODOT</td>
<td>11891</td>
<td>OR 99E &amp; I-205 NB Interchange Access</td>
<td>I-205 NB Ramp Terminus</td>
<td>I-205 NB Ramp Terminus</td>
<td>Dual left turn lanes on 99E approach to NB I-205 ramp, ramp widening to accommodate approach, dual left turn lanes from off-ramp on to Hwy 99E SB, signal modifications. (Closely related to TSP D75, D76 but not actually these projects)</td>
<td>$2,650,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Clackamas County</td>
<td>Wilsonville</td>
<td>ODOT</td>
<td>11765</td>
<td>Boones Ferry Road Urban Upgrade Phase 1</td>
<td>Ridder Road</td>
<td>Boeckman Road</td>
<td>Widen to 3 lanes and construct bike lanes and sidewalks. Existing road has had two serious injuries. Project will create left turn pockets to reduce minor crashes. Complete sidewalk will remove pedestrian conflict from roadway.</td>
<td>$5,900,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10454</td>
<td>181st - Glisan to Yamhill: Complete Buildout w/Boulevard Design</td>
<td>Glisan</td>
<td>Yamhill</td>
<td>Complete boulevard design improvements.</td>
<td>$12,160,785</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>11682</td>
<td>181st - Stark to I-84: Rockwood Safety Corridor (Enhance Safety)</td>
<td>I-84</td>
<td>Stark</td>
<td>Safety corridor: 181st/Rockwood (I-84 - Stark)</td>
<td>$2,019,700</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10497</td>
<td>181st @ Stark and Sandy Intersections: Add Turn Lanes</td>
<td>Sandy</td>
<td>Stark</td>
<td>At Sandy: Northbound right turn, 2nd westbound left turn. Overlap eastbound right turn. At Stark, add 2nd left turn lane on east and west legs.</td>
<td>$2,003,107</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10498</td>
<td>182nd - Powell and Division Intersections: Add Turn Lanes and Transit Supportive Design</td>
<td>181st at Division</td>
<td>181st at Powell</td>
<td>At Division: add second westbound left turn lane (TIF P1). At Powell, add northbound and southbound double left turn lanes (TIF P2 and TSP8). At Powell add SB and NB lanes. Transit/Enhanced Transit Corridor supportive project.</td>
<td>$1,788,678</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10533</td>
<td>190th - 30th to Cheldelin: Complete Buildout</td>
<td>30th</td>
<td>Cheldelin</td>
<td>Improve existing road to major arterial standards, signalize 190th @ Giese, Butler, Richey, Cheldelin.</td>
<td>$30,448,832</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
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### 2018 Regional Freight Strategy

#### 2018 RTP Freight Benefit Projects and Programs

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<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10431</td>
<td>190th/Highland - 11th to 30th: Complete Buildout</td>
<td>200' south of SW 11th</td>
<td>30th</td>
<td>Reconstruct and widen street to five lanes with sidewalks and bike lanes.</td>
<td>$20,884,252</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10473</td>
<td>223rd @ Stark: Add Turn Lanes</td>
<td>223rd at Stark</td>
<td>223rd at Stark</td>
<td>Add EB and NB RT lanes and 2nd NB and SB LT lanes.</td>
<td>$5,500,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10503</td>
<td>Burnside @ Powell: Eliminate Turn Lanes</td>
<td>Powell</td>
<td>Powell</td>
<td>At Powell: eliminate EB and WB left turn lanes.</td>
<td>$1,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10417</td>
<td>Hogan - Palmquist to Rugg: Complete Buildout (to arterial standards)</td>
<td>Palmquist</td>
<td>Rugg Rd.</td>
<td>Complete project development and construct new principal arterial connection with multi-use path.</td>
<td>$36,152,117</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10512</td>
<td>Hogan - Powell to Burnside: Boulevard Design + Intersection Improvements</td>
<td>Powell</td>
<td>Burnside</td>
<td>Improve to boulevard standards with center median, planter strip, and new sidewalk. Intersection improvements at Burnside and Powell. Multi-use path on west side from Wy’East Way path end to Powell Blvd. Bike lane east side between Powell and Burnside.</td>
<td>$9,289,906</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10527</td>
<td>Hogan - Powell to Palmquist: Complete Buildout</td>
<td>Powell</td>
<td>Palmquist</td>
<td>Improve to arterial standards.</td>
<td>$13,228,630</td>
<td>2028-2040</td>
<td>Yes</td>
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<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10511</td>
<td>Hogan @ Stark: Add Turn Lanes</td>
<td>Stark</td>
<td>Stark</td>
<td>Add right turn lanes on all approaches and second northbound and southbound left turns.</td>
<td>$3,500,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>11687</td>
<td>Powell @ Eastman: Left Turn Lane Addition</td>
<td>Powell at Eastman</td>
<td>Powell at Eastman</td>
<td>Powell and Eastman (add an additional southbound left turn)</td>
<td>$1,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10443</td>
<td>Sandy - 181st to 202nd: Multimodal Improvements</td>
<td>181st Ave.</td>
<td>202nd</td>
<td>Widens Sandy Blvd. to 5 lanes and adds new sidewalk, multi-use path, bike lanes from 181st to 202nd Ave.</td>
<td>$5,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>10493</td>
<td>181st - I-84 to Sandy: Widening (New SB Lane, Widen RR Crossing)</td>
<td>Sandy</td>
<td>I-84</td>
<td>Add southbound aux lane &amp; widen RR overcrossing.</td>
<td>$1,000,000</td>
<td>2028-2040</td>
<td>No</td>
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Adopted by the Metro Council on 12/6/18.

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<tr>
<td>10344</td>
<td>Gresham - 212th to Hogan: Complete Boulevard Design</td>
<td>Gresham</td>
<td>Hogan</td>
<td>Complete boulevard design on Burnside from Wallula/212 to Hogan. Improve the intersection of Burnside and Wallula by adding two northbound RT and signal, and also improve the intersection of Burnside and Hogan.</td>
<td>$34,595,974</td>
<td>No</td>
</tr>
<tr>
<td>10345</td>
<td>Gresham - 212th to Hogan: Complete Buildout (Initial Phase)</td>
<td>Gresham</td>
<td>Wallula</td>
<td>Complete improvements on Burnside from Wallula/212 to Hogan. Improve the intersection of Burnside and Wallula by adding two northbound RT and signal, and also improve the intersection of Burnside and Hogan.</td>
<td>$20,346,310</td>
<td>No</td>
</tr>
<tr>
<td>10350</td>
<td>Gresham - 212th to Hogan: Interim capacity improvements</td>
<td>Gresham</td>
<td>Wallula</td>
<td>Complete improvements on Burnside from Wallula/212 to Hogan. Improve the intersection of Burnside and Wallula by adding two northbound RT and signal, and also improve the intersection of Burnside and Hogan.</td>
<td>$9,567,000</td>
<td>No</td>
</tr>
<tr>
<td>10401</td>
<td>Multnomah County: Reconstruct Marine Drive</td>
<td>Multnomah County</td>
<td>Interlachen</td>
<td>Reconstruct Marine Drive between Interlachen and the frontage roads in Troutdale.</td>
<td>$1,841,282,000</td>
<td>Yes</td>
</tr>
<tr>
<td>10401</td>
<td>Multnomah County: Interlachen</td>
<td>Multnomah County</td>
<td>Interlachen</td>
<td>Reconstruct Marine Drive between Interlachen and the frontage roads in Troutdale.</td>
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<td>Roads and Bridges</td>
<td>Multnomah County</td>
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<td>Multnomah County</td>
<td>10399</td>
<td>Reconstruct Sandy Blvd.</td>
<td>201st Ave.</td>
<td>230th</td>
<td>Reconstruct Sandy Blvd to minor arterial standards with bike lanes, sidewalks and drainage improvements, utilizing recommendations from TGM grant. Addition of bike lanes and sidewalks will improve safety of this area and reduce conflict among modes. To address safety and reduce crashes the project will use proven safety countermeasures.</td>
<td>$ 7,906,594</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Port of Portland</td>
<td>10362</td>
<td>82nd Ave./Airport Way Grade Separation</td>
<td>82nd Avenue/Airport Way Intersection</td>
<td>82nd Avenue/Airport Way Intersection</td>
<td>Grade-separate Eastbound Airport Way over 82nd Avenue.</td>
<td>$ 75,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Port of Portland</td>
<td>10358</td>
<td>Airport Way Terminal Entrance Roadway Relocation</td>
<td>PDX Terminal Area</td>
<td>PDX Terminal Area</td>
<td>Modify Airport Way at Terminal entrance to direct to efficiently route drivers to intended destinations.</td>
<td>$ 13,625,534</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Port of Portland</td>
<td>Portland</td>
<td>11951</td>
<td>Columbia Boulevard Rail Overcrossing</td>
<td>Columbia Boulevard at Penn Junction</td>
<td>Columbia Boulevard at Penn Junction</td>
<td>Grade separate Columbia Blvd at Penn Junction to eliminate three at-grade crossings.</td>
<td>$ 28,935,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10336</td>
<td>Columbia &amp; Cully Intersection Improvements</td>
<td>NE Cully Blvd &amp; Columbia Blvd</td>
<td>NE Cully Blvd &amp; Columbia Blvd</td>
<td>Reconstruct intersection to provide signalization, left turn pockets, enhancing turning radii and improving circulation for trucks serving expanding air cargo facilities south of Portland.</td>
<td>$ 5,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10208</td>
<td>Columbia/MLK Intersection Improvements, Phase 1</td>
<td>Columbia/MLK</td>
<td>Columbia/MLK</td>
<td>Intersection and signalization improvements with right turn lane.</td>
<td>$ 4,050,187</td>
<td>2018-2027</td>
<td>Yes</td>
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<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10242</td>
<td>Interstate-Larrabee Overpass</td>
<td>N Interstate/Larrabee Bridge</td>
<td>N Interstate/Larrabee Bridge</td>
<td>Remove the existing weight-restricted, low-clearance, poor-condition Interstate to Larrabee southbound flyover ramp (Bridge #153) and replace with a new overpass including a multi-use path to connect the future N Portland Greenway Trail to the Broadway Bridge. Assess the costs and benefits of providing vehicle access on the new structure as part of project development.</td>
<td>$5,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>11807</td>
<td>NE 33rd Ave Bridge Replacement</td>
<td>NE 33rd Ave, NE (over railroad tracks and Columbia Blvd)</td>
<td>33rd Ave, NE (over railroad tracks and Columbia Blvd)</td>
<td>Replace the existing seismically vulnerable 33rd Ave bridge (#009) over railroad tracks and provide pedestrian and bicycle facilities on the new structure. Improve and signalize the intersection of 33rd &amp; Columbia, and remove the seismically vulnerable, fracture critical ramp over Columbia (#009A). Project design will consider freight movement needs, consistent with policies, street classification(s) and uses.</td>
<td>$9,200,433</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10335</td>
<td>NE 42nd/47th Ave Bridge &amp; Corridor Improvements</td>
<td>NE Killingsworth St</td>
<td>NE Columbia Blvd</td>
<td>Replace the weight-restricted NE 42nd Ave Bridge (#075) over NE Portland Hwy and the adjacent railway, and add pedestrian and bicycle facilities to the bridge and the roadway from Killingsworth to Columbia. This project will remove the weight restriction, improve vertical clearance for over-dimensional freight, and provide pedestrian and bicycle facilities.</td>
<td>$12,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10290</td>
<td>Outer Division Corridor Safety Improvements</td>
<td>SE 82nd Ave</td>
<td>City Limits</td>
<td>Design and implement multimodal corridor improvements including pedestrian lighting, new and enhanced crossings, new or modified signals, transit stop upgrades, enhanced bicycle facilities, access management, and roadway design changes to improve traffic safety.</td>
<td>$2,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>ODOT</td>
<td>10235</td>
<td>Ross Island Bridgehead Improvements</td>
<td>SW Naito Parkway</td>
<td>SW Barbur</td>
<td>Reconstruct Naito Pkwy as two-lane road w/bike lanes, sidewalks, left turn pockets, &amp; on-street parking. Includes realignment/regrading at intersecting streets; removal of Barbur tunnel, Ross Is Br ramps, Arthur/Kelly viaduct &amp; Grover ped bridge. This project will be coordinated with ODOT and with the Southwest Corridor Project, and will consider impacts to ODOT facilities including Naito Parkway and the Ross Island Bridge.</td>
<td>$69,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>11793</td>
<td>SE Yamhill/Taylor Couplet</td>
<td>SE Water</td>
<td>SE Grand</td>
<td>Improve traffic safety and capacity by converting Yamhill and Taylor to couplet operation between Water and Grand Ave, including new traffic signals at Yamhill / MLK, Yamhill / Grand, and Taylor / Water. As part of the project, reconfigure the ramp from Belmont viaduct to MLK.</td>
<td>$3,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10237</td>
<td>Southern Triangle Access Improvements</td>
<td>Powell (12th/Ross Island Bridge)</td>
<td>Hawthorne Bridge (railroad mainline)</td>
<td>Improve vehicle access to the Southern Triangle district from eastbound Powell Blvd, and improve vehicle access from CEID to westbound Powell and southbound I-5.</td>
<td>$4,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
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2018 Regional Freight Strategy

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<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>10334</td>
<td>11th/13th Ave Rail Overcrossing</td>
<td>NE 11th Ave &amp; NE Lombard Pl</td>
<td>NE 11th Ave &amp; NE Lombard Pl</td>
<td>Construct roadway overcrossing at NE 11th/13th over Kenton line.</td>
<td>$35,000,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>11117</td>
<td>Willbridge Industrial Area Rail Overcrossing</td>
<td>NW Balboa</td>
<td>NW St Helens Rd</td>
<td>Provide an alternative crossing of the BNSF Railroad to improve connectivity and safety between US 30 and the industrial properties served by NW Front Avenue in the Willbridge area of the NW Industrial District.</td>
<td>$23,113,022</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Cornelius</td>
<td>10802</td>
<td>29th Avenue Traffic Signals and Crossing Gates</td>
<td>TV Hwy [OR 8]</td>
<td>S. Alpine St.</td>
<td>Install traffic signals at intersection of Hwy 8 and 29th Avenue and install crossing gates and signals at S. 29th railroad crossing between Baseline and Alpine Streets.</td>
<td>$2,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Cornelius</td>
<td>10795</td>
<td>Holladay Street Extension - West</td>
<td>4th Ave</td>
<td>Yew St.</td>
<td>Construct new collector.</td>
<td>$2,657,500</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Cornelius</td>
<td>10798</td>
<td>Davis Street Extension - West</td>
<td>4th Ave</td>
<td>7th Ave</td>
<td>Construct new collector.</td>
<td>$4,130,629</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Forest Grove</td>
<td>10774</td>
<td>23rd Avenue Extension</td>
<td>OR HWY 47</td>
<td>24th Avenue</td>
<td>Intersection improvement with connections to Martin Road intersection improvement.</td>
<td>$4,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Forest Grove</td>
<td>11950</td>
<td>OR 47 at Purdin Road/Verboort Road Intersection Roundabout Improvement</td>
<td>Highway 47</td>
<td>Purdin Road/Verboort Road</td>
<td>Add a northbound right turn slip lane on the south leg of the roundabout and a southbound right turn slip lane on the south leg of the roundabout to the overall roundabout intersection.</td>
<td>$4,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Forest Grove</td>
<td>11661</td>
<td>OR 47/ Martin Road Intersection Improvements</td>
<td>OR 47</td>
<td>Martin Road</td>
<td>Construct improvement (e.g. roundabout) at Highway 47 intersection with Holladay Street extension, Martin Road and 23rd Avenue extension.</td>
<td>$5,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Forest Grove</td>
<td>10780</td>
<td>OR 47/ Pacific Avenue Intersection Improvements</td>
<td>OR 47</td>
<td>OR 8</td>
<td>Construct intersection improvement to add a westbound left turn lane and an eastbound right turn lane.</td>
<td>$4,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>RTP Investment Category</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Washington County</td>
<td>10553</td>
<td>209th Ave Widening and Improvements, Phase 1</td>
<td>TV Hwy</td>
<td>Kinnaman Rd</td>
<td>Widen roadway from two/three lanes to five lanes; improve from rural to urban standard with bike facilities and sidewalks; improve intersections and railroad crossing; new signals at Blanton and Kinnaman; project to serve South Hillsboro UGB area</td>
<td>$22,327,000</td>
<td>2018-2027</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>11906</td>
<td>25th Ave Extension</td>
<td>Evergreen Rd</td>
<td>Huffman St</td>
<td>Construct three-lane roadway with bike/ped facilities; realign intersection at Evergreen to avoid airport clear zone</td>
<td>$4,000,000</td>
<td>2028-2040</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>11905</td>
<td>25th Ave Turn Lanes and Bike/Ped Improvements</td>
<td>Cornell Rd</td>
<td>Griffin Oaks St</td>
<td>Widen roadway from two to three lanes (one through lane in each direction and center turn lane) with bike/ped facilities</td>
<td>$4,000,000</td>
<td>2028-2040</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>11388</td>
<td>30th Ave Construction</td>
<td>Evergreen Rd</td>
<td>Meek Rd</td>
<td>Construct three-lane industrial collector with bike/ped facilities</td>
<td>$10,500,000</td>
<td>2028-2040</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Washington Co.</td>
<td>11140</td>
<td>Brookwood Pkwy Widening</td>
<td>N/A</td>
<td>Cornell Rd</td>
<td>Widen roadway to five lanes (two through lanes in each direction with left-turn lane at intersections) with bike/ped facilities</td>
<td>$9,567,000</td>
<td>2028-2040</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>10831</td>
<td>Century Blvd Extension and Over-Crossing (North Hillsboro)</td>
<td>Bennett St</td>
<td>Wagon Wy</td>
<td>Construct three-lane road including US 26 overpass with bike/ped facilities; connect existing segments to provide new north-south connectivity</td>
<td>$13,733,960</td>
<td>2028-2040</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>11169</td>
<td>Cornell Rd &amp; 25th Ave Intersection Improvements</td>
<td>N/A</td>
<td>N/A</td>
<td>Widen 25th Ave to provide double southbound left-turn lanes and second northbound through lane</td>
<td>$6,378,000</td>
<td>2018-2027</td>
</tr>
<tr>
<td>RTP Investment Category</td>
<td>County</td>
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<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Washington County</td>
<td>11170</td>
<td>Cornell Rd &amp; Brookwood Pkwy and Cornell &amp; 48th Ave Intersection Improvements</td>
<td>N/A</td>
<td>N/A</td>
<td>Widen Cornell to provide double left-turn lanes in both eastbound and westbound at Brookwood intersection; and double eastbound left-turn lanes at 48th Ave</td>
<td>4,704,000</td>
<td>2018-2027</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Washington Co.</td>
<td>10836</td>
<td>Evergreen Rd Widening and Bike/Ped Improvements</td>
<td>Glencoe Rd</td>
<td>15th Ave</td>
<td>Widen roadway from three to five lanes, complete missing sidewalks, and upgrade to buffered bike lanes</td>
<td>5,782,720</td>
<td>2028-2040</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Washington County</td>
<td>11284</td>
<td>Farmington Rd Widening and Bike/Ped Improvements, Phase 1</td>
<td>185th Ave</td>
<td>198th Ave</td>
<td>Widen roadway from two to five lanes with bike/ped facilities</td>
<td>8,000,000</td>
<td>2018-2027</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Washington County</td>
<td>11285</td>
<td>Farmington Rd Widening and Bike/Ped Improvements, Phase 2</td>
<td>198th Ave</td>
<td>209th Ave</td>
<td>Widen roadway to five lanes with bike/ped facilities; new signal at 209th Ave</td>
<td>7,000,000</td>
<td>2028-2040</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>10821</td>
<td>Huffman St Extension, Phase 1</td>
<td>Brookwood Pkwy</td>
<td>Sewell Rd</td>
<td>Construct five-lane road with bike/ped facilities</td>
<td>8,387,070</td>
<td>2018-2027</td>
</tr>
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<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>11890</td>
<td>Huffman St Extension, Phase 2</td>
<td>Sewell Rd</td>
<td>Jackson School Rd</td>
<td>Construct five-lane road with bike/ped facilities</td>
<td>6,500,000</td>
<td>2018-2027</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Washington County</td>
<td>11907</td>
<td>Jackson School Rd Improvements</td>
<td>Evergreen Rd</td>
<td>Storey Creek (UGB)</td>
<td>Improve roadway from rural to urban standard and widen to three lanes with bike/ped facilities</td>
<td>11,400,000</td>
<td>2028-2040</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>11387</td>
<td>Meek Rd Improvements, Phase 1</td>
<td>Sewell Rd</td>
<td>Starr Blvd</td>
<td>Widen and improve roadway to three lanes with bike/ped facilities</td>
<td>6,309,500</td>
<td>2028-2040</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>11910</td>
<td>Meek Rd Improvements, Phase 2</td>
<td>Jackson School Rd</td>
<td>Sewell Rd</td>
<td>Improve Meek Rd to address safety for industrial access to/from Jackson School Rd</td>
<td>3,000,000</td>
<td>2028-2040</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>11383</td>
<td>New North-South Collector (North Hillsboro)</td>
<td>Jacobsen Rd</td>
<td>Schaaf Rd</td>
<td>Construct three-lane roadway with bike/ped facilities</td>
<td>2,657,500</td>
<td>2018-2027</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>11147</td>
<td>Schaaf Rd Reconstruction</td>
<td>Helvetia Rd</td>
<td>New north-south collector</td>
<td>Reconstruct rural gravel road to three-lane roadway with bike/ped facilities</td>
<td>4,252,000</td>
<td>2018-2027</td>
</tr>
</tbody>
</table>

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<tbody>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>10822</td>
<td>Starr Blvd Reconstruction and Improvements, Phase 1</td>
<td>Evergreen Rd</td>
<td>Huffman St</td>
<td>Construct three-lane road with bike/ped facilities</td>
<td>$5,315,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>11364</td>
<td>Starr Blvd Reconstruction and Improvements, Phase 2</td>
<td>Huffman St</td>
<td>Meek Rd</td>
<td>Construct three-lane road with bike/ped facilities</td>
<td>$4,252,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>10817</td>
<td>Alocek Dr Gap Completion</td>
<td>Cornelius Pass Rd</td>
<td>Amberwood Dr</td>
<td>Complete missing segment of Alocek Dr between Cornelius Pass Rd and Amberwood Dr as three-lane road with bike lanes and sidewalks</td>
<td>$2,126,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Washington County</td>
<td>10824</td>
<td>Cornell Rd Turn Lanes and Bike/Ped Improvements (Main to Arrington)</td>
<td>Main St</td>
<td>Arrington Rd</td>
<td>Widen roadway from four to five lanes with bike/ped facilities</td>
<td>$9,830,624</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Washington Co.</td>
<td>11149</td>
<td>Helvetia Rd Turn Lanes and Bike/Ped Improvements</td>
<td>Schaaf Rd</td>
<td>West Union Rd</td>
<td>Widen roadway to three lanes (one through lane in each direction and center turn lane) with bike/ped facilities</td>
<td>$4,252,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>11150</td>
<td>Jacobson Rd Turn Lanes and Bike/Ped Improvements</td>
<td>Helvetia Rd</td>
<td>Century Blvd</td>
<td>Widen roadway from two to three lanes (add center turn lane); complete bike/ped facilities; reconfigure intersection with Helvetia Rd to right-in, right-out only</td>
<td>$2,657,500</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Hillsboro</td>
<td>11280</td>
<td>Ronler Dr Extension</td>
<td>Cornelius Pass Rd</td>
<td>215th Ave</td>
<td>Construct three-lane extension with bike/ped facilities</td>
<td>$1,000,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>ODOT</td>
<td>11392</td>
<td>TV Hwy &amp; River Rd Intersection Improvements</td>
<td>N/A</td>
<td>N/A</td>
<td>Construct eastbound right-turn lane and second northbound left-turn lane; modify traffic signal; improve bike and ped crossing of TV Hwy</td>
<td>$2,126,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>Washington Co.</td>
<td>11341</td>
<td>West Union Rd Widening and Improvements</td>
<td>Helvetia Rd</td>
<td>Cornelius Pass Rd</td>
<td>Widen to three lanes from Helvetia to Century, and five lanes from Century to Cornelius Pass, including bike/ped facilities along entire length</td>
<td>$12,000,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
</tbody>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Sherwood</td>
<td>Sherwood</td>
<td>11404</td>
<td>Baler Way Extension</td>
<td>SW Langer Farms Parkway</td>
<td>SW Tualatin-Sherwood Road</td>
<td>Extend SW Baler Way (3-lane collector) between SW Tualatin-Sherwood Road and SW Langer Farms Parkway, possibly SW Pacific Highway depending upon results of widening of SW Tualatin-Sherwood Road project by Washington County.</td>
<td>$3,800,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Sherwood</td>
<td>To be determined, ODOT</td>
<td>12047</td>
<td>Brookman Road Intersection Realignment</td>
<td>SW Pacific Highway</td>
<td>SW Brookman Road</td>
<td>Realigns and relocates the SW Brookman Road intersection with SW Pacific Highway (OR 99W) to accommodate the expansion of SW Brookman Road for future development.</td>
<td>$15,500,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Sherwood</td>
<td>Sherwood</td>
<td>10699</td>
<td>Oregon Street Improvements</td>
<td>SW Murdock Rd</td>
<td>SW Langer Farms Pkwy</td>
<td>Widen existing substandard 2-lane road (no sidewalks, no median) to a 3-lane collector meeting current TSP standards (8' sidewalks, 5' landscape strip, 12' travel, 14' median, 12' travel, 5' landscape, 8' sidewalks, plus 2 on-street bike lanes or 4' added to each 8' sidewalk), On-street bike lanes vs. 2 multi-use paths TBD with future development.</td>
<td>$5,700,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Sherwood</td>
<td>To be determined, Washington County</td>
<td>10674</td>
<td>Oregon-Tonquin Intersection Improvements</td>
<td>SW Oregon Street</td>
<td>SW Tonquin Rd</td>
<td>Reconstruct and realign three leg intersection with a roundabout (partial two-lane roundabout) approx 400 feet northeast of existing roundabout at SW Oregon St &amp; Murdock Rd. ROW, PE, design &amp; construction. Potential for signal in-lieu of dual-roundabout system if better for development and once SW 124th Ave project is completed. If roundabout, project will include rapid flashing beacons at new roundabout and retrofit of adjacent roundabout to meet MUTCD suggestions for pedestrian crossings at roundabouts.</td>
<td>$2,400,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Sherwood</td>
<td>Sherwood</td>
<td>12046</td>
<td>Tonquin Area East-West Collector</td>
<td>SW 124th Avenue</td>
<td>SW Tonquin Road</td>
<td>Construct 3-lane collector status road between SW 124th Avenue and SW Tonquin Road through the Tonquin employment area to serve recent UGB annexation area.</td>
<td>$10,500,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Sherwood</td>
<td>Sherwood</td>
<td>10700</td>
<td>Arrow Street Improvements</td>
<td>SW Langer Farms Parkway</td>
<td>SW Gerda Lane</td>
<td>Construct 3-lane collector street to TSP standards between SW Langer Farms Parkway and SW Gerda Lane.</td>
<td>$8,200,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Tigard</td>
<td>Tigard</td>
<td>10755</td>
<td>72nd Ave. Improvements - 99W to Hunziker</td>
<td>99W</td>
<td>Hunziker</td>
<td>Build complete street (with bike lanes sidewalks) as determined by conceptual design phase; Likely to be 3-lane section from Hwy 99W to Clinton St; 5-lane section from Clinton St to Hunziker St.</td>
<td>$14,400,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Tigard</td>
<td>ODOT</td>
<td>10751</td>
<td>OR 217 Overcrossing - Beveland to Hunziker</td>
<td>Hunziker Road</td>
<td>Beveland</td>
<td>Realign Hunziker Road to meet Hampton Street at 72nd Ave, remove existing 72nd/Hunziker Road intersection, provide bicycle, pedestrian and transit facilities. Project to be refined based on SW Corridor High Capacity Transit recommendations.</td>
<td>$30,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Tigard</td>
<td>ODOT</td>
<td>11666</td>
<td>OR 99W Intersection Improvements (CON)</td>
<td>64th Ave.</td>
<td>Durham Rd.</td>
<td>Construction phase: Provide increased capacity and safety improvements at priority intersections by adding turn and/or auxiliary lanes, improved sidewalks and bike lanes, pedestrian crossings, and access management from I-5 to Durham Road. See 2035 Tigard TSP Project #66 for specific improvements.</td>
<td>$30,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Tigard</td>
<td>ODOT</td>
<td>10770</td>
<td>OR 99W Intersection Improvements (PE)</td>
<td>64th Ave.</td>
<td>Durham Rd.</td>
<td>Project development phase: Provide increased capacity and safety improvements at priority intersections by adding turn and/or auxiliary lanes, improved sidewalks and bike lanes, pedestrian crossings, and access management from I-5 to Durham Road. See 2035 Tigard TSP Project #66 for specific improvements.</td>
<td>$5,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Tigard</td>
<td>Tigard</td>
<td>10768</td>
<td>Upper Boones Ferry Road (I-5 to Durham Road) Complete Street and Intersection Improvements</td>
<td>Interstate 5</td>
<td>South of Durham Rd</td>
<td>Widens Upper Boones Ferry Rd to five lanes with bike lanes and sidewalks from Interstate 5 through Durham Road, including additional turn lanes at intersections with Sequoia Pkwy, 72nd Ave, and Durham Rd.</td>
<td>$11,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
</tbody>
</table>
## 2018 RTP Freight Benefit Projects and Programs

Projects are listed alphabetically by County and nominating agency.

<table>
<thead>
<tr>
<th>RTP Investment Category</th>
<th>County</th>
<th>Nominating Agency</th>
<th>Primary Facility Owner</th>
<th>RTP ID</th>
<th>Project Name</th>
<th>Start Location</th>
<th>End Location</th>
<th>Description</th>
<th>Estimated Cost (2016 dollars)</th>
<th>Time Period</th>
<th>Included in Financially Constrained project list?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Tigard</td>
<td>Tigard</td>
<td>11995</td>
<td>Wall St (Hunziker to Tech Center)</td>
<td>Hunziker Road</td>
<td>Tech Center Drive</td>
<td>Construct new street with sidewalks and bike lanes from Hunziker Road (along Wall Street) to Tech Center Drive to improve freight access and connectivity to Tigard Triangle</td>
<td>$3,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Tualatin</td>
<td>Tualatin</td>
<td>11423</td>
<td>Avery</td>
<td>Teton</td>
<td>Tualatin-Sherwood</td>
<td>Upgrade to urban standards.</td>
<td>$3,826,800</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Tualatin</td>
<td>Tualatin</td>
<td>11417</td>
<td>Blake Street Extension</td>
<td>115th</td>
<td>124th Ave</td>
<td>Extend Blake Street to create an east-west connection between 115th and 124th. Install signal at Blake and 124th. New road section will provide an alternative route for industrial traffic on the high injury corridor: Tualatin/Sherwood Road.</td>
<td>$17,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Tualatin</td>
<td>Tualatin</td>
<td>10715</td>
<td>Herman</td>
<td>124th</td>
<td>Tualatin</td>
<td>To improve safety and add active transportation options: Upgrade this road section to urban standards with sidewalks, bicycle lanes and curbs/gutters.</td>
<td>$6,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Tualatin</td>
<td>Tualatin</td>
<td>10718</td>
<td>Herman</td>
<td>Cipole</td>
<td>124th Ave</td>
<td>Reconstruction: Widen to 3-lanes from Cipole to 124th.</td>
<td>$2,736,162</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Tualatin</td>
<td>Tualatin</td>
<td>10716</td>
<td>Myslony</td>
<td>112th</td>
<td>124th Ave</td>
<td>Reconstruct/widen from 112th to 124th to fill system, includes bridge. Improve the intersection of 124th and Myslony.</td>
<td>$10,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Tualatin</td>
<td>Tualatin</td>
<td>10738</td>
<td>Teton</td>
<td>Avery</td>
<td>Tualatin</td>
<td>To improve safety and add active transportation improvements in an employment corridor: Widen Teton to three lanes and add bike lanes. Add right-turn lanes from NB Teton to WB T/S Road. Signalize the intersection of Teton/Tualatin Rd. Add SB turn-pocket at Teton/Avery and signalize intersection.</td>
<td>$7,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>RTP ID</td>
<td>Project Name</td>
<td>County</td>
<td>Nominating Agency</td>
<td>Primary Facility Owner</td>
<td>Description</td>
<td>Estimated Cost (2016 dollars)</td>
<td>Year-range</td>
<td>Financially Constrained project list?</td>
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<tr>
<td>10717</td>
<td>Cipole Street Reconstruction</td>
<td>Washington</td>
<td>ODOT</td>
<td>Tualatin</td>
<td>Reconstruct/widen to 3 lanes from S 59W to Tualatin Sherwood, add a 3rd lane for the Ice Age Trail use path for the Ice Age Trail, parallel to Cipole and Herman. Project or a portion of the project is outside the UGB.</td>
<td>$21,391,890</td>
<td>2018-2040</td>
<td>No</td>
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<tr>
<td>11430</td>
<td>Nyerig</td>
<td>Washington</td>
<td>ODOT</td>
<td>Tualatin</td>
<td>Add an additional on-ramp lane for vehicles traveling on S 59W near the intersection of Nyerig and Portland Rd.</td>
<td>$2,900,000</td>
<td>2018-2027</td>
<td>No</td>
<td></td>
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<tr>
<td>11470</td>
<td>Basalt Creek Parkway</td>
<td>Washington</td>
<td>ODOT</td>
<td>Tualatin</td>
<td>Extend new 5 lane Arterial to Basalt Creek Parkway and add street lighting.</td>
<td>$31,700,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>11487</td>
<td>Boones Ferry Rd.</td>
<td>Washington</td>
<td>ODOT</td>
<td>Tualatin</td>
<td>Add an additional on-ramp lane for vehicles traveling on S 59W near the intersection of Nyerig and Portland Rd.</td>
<td>$31,700,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>10587</td>
<td>Comox Pass Rd.</td>
<td>Washington</td>
<td>ODOT</td>
<td>Tualatin</td>
<td>Add an additional on-ramp lane for vehicles traveling on S 59W near the intersection of Nyerig and Portland Rd.</td>
<td>$31,700,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>10559</td>
<td>Cornell Improvements</td>
<td>Washington</td>
<td>ODOT</td>
<td>Tualatin</td>
<td>Add an additional on-ramp lane for vehicles traveling on S 59W near the intersection of Nyerig and Portland Rd.</td>
<td>$31,700,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>10591</td>
<td>Glencoe Rd. Improvements</td>
<td>Washington</td>
<td>ODOT</td>
<td>Tualatin</td>
<td>Add an additional on-ramp lane for vehicles traveling on S 59W near the intersection of Nyerig and Portland Rd.</td>
<td>$31,700,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>10551</td>
<td>Jenkins Rd. Improvements</td>
<td>Washington</td>
<td>ODOT</td>
<td>Tualatin</td>
<td>Add an additional on-ramp lane for vehicles traveling on S 59W near the intersection of Nyerig and Portland Rd.</td>
<td>$31,700,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>10578</td>
<td>Merlo/179th Improvements</td>
<td>Washington</td>
<td>ODOT</td>
<td>Tualatin</td>
<td>Add an additional on-ramp lane for vehicles traveling on S 59W near the intersection of Nyerig and Portland Rd.</td>
<td>$31,700,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>11314</td>
<td>Roy Rogers Rd.</td>
<td>Washington</td>
<td>ODOT</td>
<td>Tualatin</td>
<td>Add an additional on-ramp lane for vehicles traveling on S 59W near the intersection of Nyerig and Portland Rd.</td>
<td>$31,700,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>11486</td>
<td>Scholls Ferry Rd.</td>
<td>Washington</td>
<td>ODOT</td>
<td>Tualatin</td>
<td>Add an additional on-ramp lane for vehicles traveling on S 59W near the intersection of Nyerig and Portland Rd.</td>
<td>$31,700,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tbody>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Washington County</td>
<td>Washington County</td>
<td>11903</td>
<td>Roy Rogers Rd.</td>
<td>Chicken Creek Bridge</td>
<td>Borchers Rd</td>
<td>Widen roadway to 5 lanes, includes sidewalks and bike lanes</td>
<td>$11,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Washington County</td>
<td>Washington County</td>
<td>11915</td>
<td>Scholls Ferry Rd</td>
<td>Tile Flat Rd.</td>
<td>Roy Rogers Rd.</td>
<td>Widen roadway to 5 lanes, includes sidewalks and bike lanes</td>
<td>$8,300,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Washington County</td>
<td>Washington Co.</td>
<td>11452</td>
<td>Scholls Ferry Rd. Improvements</td>
<td>West of Tile Flat Rd.</td>
<td></td>
<td>Realign curves to improve safety and reduce crashes.</td>
<td>$4,600,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Washington County</td>
<td>Washington Co.</td>
<td>10590</td>
<td>Tonquin Rd. Improvements</td>
<td>Grahams Ferry Rd.</td>
<td>124th Ave.</td>
<td>Widen from three to five lanes with bike lanes and sidewalks.</td>
<td>$11,400,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Washington County</td>
<td>Washington Co.</td>
<td>10568</td>
<td>Tualatin-Sherwood Rd. Improvements</td>
<td>Langer Farms Pkwy.</td>
<td>Teton Ave.</td>
<td>Widen from two to five lanes with bike lanes and sidewalks.</td>
<td>$35,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Washington County</td>
<td>Washington Co.</td>
<td>10575</td>
<td>West Union Rd.</td>
<td>Cornelius Pass Rd.</td>
<td>185th Ave.</td>
<td>Widen from two to five lanes with bike lanes and sidewalks.</td>
<td>$22,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Washington County</td>
<td>Washington Co.</td>
<td>11469</td>
<td>124th Ave Improvements</td>
<td>Tualatin-Sherwood Rd.</td>
<td>Grahams Ferry Rd</td>
<td>Widen 124th from 2 lanes to 5 lanes with bike lanes and sidewalks.</td>
<td>$14,900,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Roads and Bridges</td>
<td>Washington County</td>
<td>Washington County</td>
<td>Washington County</td>
<td>11737</td>
<td>Cornell @ 185th Intersection Improvements</td>
<td>185th Ave.</td>
<td>Cornell Rd</td>
<td>Prioritize near-term improvements such as signal timing, transit prioritization, traffic operations, monitoring, and specific turn lane configurations. Intersection improvements (and/or other reasonable replacement improvements) are to be implemented and prioritized as funding allows. If, after such improvements have been considered and motor vehicle traffic congestion becomes unacceptable, then these intersections could be considered as candidates for grade separation and/or other improvements to meet travel needs.</td>
<td>$22,300,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>RTP ID</td>
<td>Project Name</td>
<td>Start Location</td>
<td>End Location</td>
<td>Description</td>
<td>Estimated Cost (2016 dollars)</td>
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<tr>
<td>10552</td>
<td>Cornell/Cornelius Pass Intersection</td>
<td>N/A</td>
<td>N/A</td>
<td>Prioritize near-term improvements such as signal timing, transit prioritization, traffic operations, monitoring, right-of-way and purchase, etc.</td>
<td>$22,500,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>11436</td>
<td>Day Rd Overcrossing</td>
<td>Washington County</td>
<td>Elligen Rd</td>
<td>Extend new 4-lane overcrossing over I-5 from Boones Ferry Rd to Elligen Rd.</td>
<td>$46,900,000</td>
<td>2028-2040</td>
<td>No</td>
<td></td>
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<tr>
<td>113913</td>
<td>East-West Arterial Overcrossing</td>
<td>Washington County</td>
<td>Heleniuss 51 Rd</td>
<td>Extend new 4-lane overcrossing from Heleniuss Rd to 85th Ave.</td>
<td>$4,000,000</td>
<td>2028-2040</td>
<td>No</td>
<td></td>
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<tr>
<td>113934</td>
<td>Wide roadway to 3 lanes, includes sidewalks and bike lanes</td>
<td>Washington County</td>
<td>Tonquin Rd</td>
<td>Extend new 4-lane overcrossing on I-5 from Boones Ferry Rd to Elligen Rd.</td>
<td>$4,000,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>113937</td>
<td>Wide roadway to 5 lanes, includes sidewalks and bike lanes</td>
<td>Washington County</td>
<td>Day Rd</td>
<td>Extend new 4-lane overcrossing on I-5 from Boones Ferry Rd to Elligen Rd.</td>
<td>$6,000,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>10596</td>
<td>Murray/FV Hwy. Intersection</td>
<td>Washington County</td>
<td>TV Hwy.</td>
<td>Intersection improvement at Murray Blvd. and TV Hwy.</td>
<td>$26,600,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>10598</td>
<td>Southern Arterial Hwy.</td>
<td>Washington County</td>
<td>I-5</td>
<td>Purchase ROW. Construct 2/3 lane arterial with bike lanes and sidewalks.</td>
<td>$140,000,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>11489</td>
<td>Boones Ferry Rd / I-5 off ramp improvements</td>
<td>Wilsonville</td>
<td>SB 15 off ramp</td>
<td>Boones Ferry Rd</td>
<td>$1,063,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Project Name</td>
<td>Start Location</td>
<td>End Location</td>
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<td>Estimated Cost (2016 dollars)</td>
<td>Time Period</td>
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<tr>
<td>Wilsonville 11243 Day Road Improvements</td>
<td>Boones Ferry Rd.</td>
<td>Wilsonville</td>
<td>Widen street from 3 to 5 lanes with buffered bike lanes, sidewalks, and street lighting, for improved structure integrity, safety, and to provide congestion relief. Sidewalk retrofit and creation of Tonquin Trail multi-use path spur will reduce pedestrian and vehicle conflicts. Bike buffer walls will reduce bicycle and pedestrian conflicts.</td>
<td>$10,560,000</td>
<td>2018-2040</td>
<td>Yes</td>
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<tr>
<td>Wilsonville 10853 Garden Acres Road Extension</td>
<td>Day Road</td>
<td>Wilsonville</td>
<td>Construct three lane road extension with sidewalk and cycle track and rebuild/broaden of bike and greenways link to connect Camas-Wilsonville trail to south of the area.</td>
<td>$14,260,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Wilsonville 11809 Java Road Connection and Signal</td>
<td>Garden Acres Road</td>
<td>Wilsonville</td>
<td>Construct new Java Road with buffered bike lanes, connect Cottle Trail, reconstruct Day Road/Graham Ferry Road/Acres Road, and install traffic signal at Grahams Ferry Road/Acres Road.</td>
<td>$1,500,000</td>
<td>2018-2027</td>
<td>No</td>
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<tr>
<td>ODOT 11969 I-205 Abernethy Bridge (CON)</td>
<td>OR99E Interchange</td>
<td>Clackamas County</td>
<td>Widen both directions of the I-205 Abernethy Bridge and approach/adjacent roads to address recurring bottlenecks on the bridge. Install Active Traffic Management (ATM) on northbound and southbound.</td>
<td>$200,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>ODOT 11585 I-205 Abernethy Bridge (PE and ROW)</td>
<td>OR99E Interchange</td>
<td>Clackamas County</td>
<td>Widen bridge to address recurring bottlenecks.</td>
<td>$8,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>ODOT 11981 I-205 Northbound Auxiliary Lane, Sunset Expressway Entrance</td>
<td>OS 99W, SR 503 Exits</td>
<td>Clackamas County</td>
<td>Provide 205 NB auxiliary lane and SR 503 exits, improve access to Sunset Expressway.</td>
<td>$7,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
<td></td>
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</tr>
<tr>
<td>ODOT 11904 I-205 Southbound and Northbound Widening</td>
<td>Stafford Rd Interchange</td>
<td>Clackamas County</td>
<td>When Interstate 205 by one lane in both directions to add new auxiliary lane.</td>
<td>$200,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
<td></td>
<td></td>
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<td></td>
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Visit the 2018 RTP website for more information at: oregonmetro.gov/rtp

Adopted by the Metro Council on 12/6/18.

APPENDIX A
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<tr>
<td>Throughways</td>
<td>Clackamas County</td>
<td>ODOT</td>
<td>ODOT</td>
<td>11990</td>
<td>I-5 Southbound: Wilsonville Rd to Wilsonville-Hubbard Hwy</td>
<td>Wilsonville Rd</td>
<td>Wilsonville-Hubbard Hwy</td>
<td>Add an auxiliary lane on I-5 from Wilsonville Road to the Wilsonville-Hubbard Highway, including improvements to the Boone Bridge, PE, ROW and Construction Phases.</td>
<td>$80,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Throughways</td>
<td>Clackamas County</td>
<td>ODOT</td>
<td>ODOT</td>
<td>11301</td>
<td>OR 212/224 Sunrise Hwy Phase 2: SE 122nd to SE 172nd (CON)</td>
<td>I-205</td>
<td>172nd Ave.</td>
<td>Construct (CON) Phase 2 of the OR 212/224 Sunrise corridor, consisting of a 4-lane roadway from SE 122nd Ave to SE 172nd Ave, consistent with the FEIS/ROD.</td>
<td>$100,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Throughways</td>
<td>Clackamas County</td>
<td>ODOT</td>
<td>ODOT</td>
<td>10890</td>
<td>OR 212/224 Sunrise Hwy Phase 2: SE 122nd to SE 172nd (PE, ROW)</td>
<td>I-205</td>
<td>172nd Ave.</td>
<td>Conduct preliminary engineering (PE) and acquire right-of-way (ROW) on phase 2 of the OR 212/224 Sunrise Corridor from I-205 to SE 172nd Ave consistent with the Final Environmental Impact Statement (FEIS)/Record of Decision (ROD).</td>
<td>$70,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Throughways</td>
<td>Clackamas County</td>
<td>ODOT</td>
<td>ODOT</td>
<td>11350</td>
<td>OR 224 Milwaukie Expressway improvements</td>
<td>I-205</td>
<td>Rusk Rd</td>
<td>Construct a third westbound lane on Milwaukie Expressway (Hwy-224) from I-205 to Rusk Rd</td>
<td>$12,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Throughways</td>
<td>Clackamas County</td>
<td>ODOT</td>
<td>ODOT</td>
<td>11992</td>
<td>I-205 Operational Improvements</td>
<td>Columbia River</td>
<td>I-5</td>
<td>Construct improvements to address bottlenecks and improve safety on I-205. Specific improvements as identified in operational analysis, mobility corridor analysis and refinement planning.</td>
<td>$20,000,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Throughways</td>
<td>Clackamas County, Multnomah County</td>
<td>ODOT</td>
<td>ODOT</td>
<td>11305</td>
<td>I-205 Active Traffic Management</td>
<td>Columbia River</td>
<td>I-5</td>
<td>Construct improvements to address recurring bottlenecks on I-205. Specific improvements as identified in operational analysis, Mobility Corridor analysis, refinement planning and Active Traffic Management Atlas.</td>
<td>$15,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Clackamas County, Multnomah County, Washington County</td>
<td>ODOT ODOT</td>
<td>11991</td>
<td>I-5 Freight Operational Improvements</td>
<td>Columbia River</td>
<td>South MPO Boundary</td>
<td>Construct improvements to address bottlenecks and improve safety on I-5. Specific improvements as identified in operational analysis, mobility corridor analysis and refinement planning.</td>
<td>$200,000,000</td>
<td>2028-2040</td>
<td>No</td>
<td></td>
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<tr>
<td>Multnomah County</td>
<td>ODOT ODOT</td>
<td>11370</td>
<td>I-205 Northbound Auxiliary Lane Powell to I-84</td>
<td>Powell Entrance Ramp</td>
<td>I-84</td>
<td>Design and construct an auxiliary lane on northbound I-205 from Powell Blvd to the I-84 interchange.</td>
<td>$15,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Multnomah County</td>
<td>ODOT ODOT</td>
<td>10893</td>
<td>I-5 Columbia River Bridge</td>
<td>Victory Blvd.</td>
<td>Washington State line</td>
<td>Replace I-5/Columbia River bridges and improve interchanges on I-5. Project adds protected/buffered bikeways, cycletracks and a new trail/multituse path or extension.</td>
<td>$3,169,866,000</td>
<td>2028-2040</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Multnomah County</td>
<td>ODOT ODOT</td>
<td>11304</td>
<td>I-5 South Operational Improvements</td>
<td>Marquam Bridge</td>
<td>Region Boundary</td>
<td>Construct improvements to address recurring bottlenecks on I-5 south of the central city. Specific improvements as identified in operational analysis, Mobility Corridor analysis and refinement planning.</td>
<td>$15,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Multnomah County</td>
<td>ODOT ODOT</td>
<td>11974</td>
<td>I-405 Operational Improvements</td>
<td>Fremont Bridge</td>
<td>I-5</td>
<td>Construct operational improvements to address bottlenecks and improve safety on I-405. Specific improvements as identified in operational analysis, mobility corridor analysis, and refinement planning</td>
<td>$50,000,000</td>
<td>2028-2040</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Multnomah County</td>
<td>ODOT ODOT</td>
<td>11583</td>
<td>I-5 Northbound: Lower Boones Ferry to Carman Auxiliary Lane Extension</td>
<td>Lower Boones Ferry Rd. Interchange</td>
<td>Carman Dr. Interchange</td>
<td>Extend existing auxiliary lane between the Lower Boones Ferry Road interchange and the Carman Drive interchange.</td>
<td>$22,500,000</td>
<td>2028-2040</td>
<td>No</td>
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## 2018 RTP Freight Benefit Projects and Programs

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<td>Throughways</td>
<td>Multnomah County</td>
<td>ODOT</td>
<td>ODOT</td>
<td>11993</td>
<td>I-84 Operational Improvements</td>
<td>I-5</td>
<td>Troutdale</td>
<td>Construct improvements to address bottlenecks and improve safety on I-84.</td>
<td>$20,000,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Throughways</td>
<td>Multnomah County, Washington County</td>
<td>ODOT</td>
<td>ODOT</td>
<td>11971</td>
<td>US 26 (Sunset Highway) Operational Improvements</td>
<td>I-405</td>
<td>West MPO Boundary</td>
<td>Construct Improvements to address bottlenecks and improve safety on US 26 (Sunset Highway). Specific improvements as identified in operational analysis, mobility corridor analysis, and refinement planning</td>
<td>$50,000,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Throughways</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>ODOT</td>
<td>11393</td>
<td>US 26 Widening - Brookwood to Cornelius Pass</td>
<td>Brookwood Pkwy/Helvetia Rd</td>
<td>Cornelius Pass Rd</td>
<td>Widen US 26 from four to six lanes</td>
<td>$26,575,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Throughways</td>
<td>Washington County</td>
<td>Hillsboro</td>
<td>ODOT</td>
<td>11279</td>
<td>US 26 &amp; 185th Ave Interchange Refinement Study and Implementation</td>
<td>N/A</td>
<td>N/A</td>
<td>Conduct interchange study and implementation</td>
<td>$26,575,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Throughways</td>
<td>Washington County</td>
<td>OdOT</td>
<td>ODOT</td>
<td>11402</td>
<td>I-5 Northbound: Auxiliary Lane Extension Nyberg to Lower Boones Ferry</td>
<td>Nyberg Rd. Interchange</td>
<td>Lower Boones Ferry Rd. Interchange</td>
<td>Extend existing auxiliary lane.</td>
<td>$13,500,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Throughways</td>
<td>Washington County</td>
<td>OdOT</td>
<td>ODOT</td>
<td>11986</td>
<td>OR 217 Northbound Auxiliary Lane 99W to Scholls Ferry</td>
<td>99W</td>
<td>Scholls Ferry</td>
<td>Extend OR 217 Northbound (NB) auxiliary lane from OR 99W to Scholls Ferry. Construction (CON) phase</td>
<td>$50,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Throughways</td>
<td>Washington County</td>
<td>OdOT</td>
<td>ODOT</td>
<td>12019</td>
<td>OR 217 Northbound Auxiliary Lane 99W to Scholls Ferry (PE, ROW)</td>
<td>OR99W</td>
<td>Scholls Ferry Interchange</td>
<td>Extend OR 217 Northbound (NB) auxiliary lane from OR 99W to Scholls Ferry. ROW and PE phase</td>
<td>$7,500,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Throughways</td>
<td>Washington County</td>
<td>OdOT</td>
<td>ODOT</td>
<td>11987</td>
<td>OR 217 Southbound Auxiliary Lane Beaverton Hillsdale Hwy to 99W (CON)</td>
<td>Beaverton-Hillsdale Hwy</td>
<td>OR99W</td>
<td>Extend Southbound (SB) auxiliary lane from Beaverton-Hillsdale Hwy to OR 99W. Build collector/distributor road from Allen Blvd to Denny Rd. Construction Phase</td>
<td>$45,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Throughways</td>
<td>Washington County</td>
<td>OdOT</td>
<td>ODOT</td>
<td>11988</td>
<td>OR 217 Southbound Braided Ramps Beaverton-Beaverton Hillsdale Hwy to Allen Blvd</td>
<td>Beaverton-Hillsdale Hwy</td>
<td>Allen Blvd</td>
<td>Design and construct braided ramps on southbound OR 217 at Canyon Rd and Beaverton Hillsdale Hwy.</td>
<td>$50,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<tr>
<td>Throughways</td>
<td>Washington County</td>
<td>I-5/OR 217 Interchange Phase 2</td>
<td>N/A</td>
<td>I-5/OR 217 Interchange</td>
<td>I-5/OR 217 Interchange Phase 2 - southbound OR 217 to southbound I-5 entrance ramp; southbound I-5 exit to Kruse Way loop ramp.</td>
<td>$53,000,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Throughways</td>
<td>Washington County</td>
<td>OR 217 Capacity Improvements</td>
<td>US 26 (Sunset Hwy)</td>
<td>I-5</td>
<td>Construct as a 6-lane freeway, adding 3rd through lane in each direction, and complete interchange reconstruction with ramp and overcrossing improvements</td>
<td>$398,500,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Throughways</td>
<td>Washington County</td>
<td>OR 217 Interchange, Safety, and Operational Improvements</td>
<td>US 26 (Sunset Highway)</td>
<td>I-5</td>
<td>Design and construct improvements to OR 217 between US 26 and Allen/Denney interchange to improve safety, reliability and mobility</td>
<td>$75,000,000</td>
<td>2028-2040</td>
<td>No</td>
</tr>
<tr>
<td>Throughways</td>
<td>Washington County</td>
<td>OR 217 Northbound Auxiliary Lane Extension Scholls Ferry to Allen/Denney</td>
<td>Scholls Ferry Road</td>
<td>Allen/Denney</td>
<td>Extend OR 217 auxiliary lane from Scholls Ferry to Allen/Denney interchange by filling in the existing auxiliary lane and modifying related ramp connections</td>
<td>$50,000,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Throughways</td>
<td>Washington County</td>
<td>OR 217/72nd Ave. Interchange Improvements</td>
<td>OR 217/72nd Avenue</td>
<td>OR 217/72nd Avenue</td>
<td>Complete interchange reconstruction with additional ramps and bridge structure replacement</td>
<td>$21,300,000</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Transportation</td>
<td>Multnomah County</td>
<td>181st - Gislan to I-84: ACM with Adaptive Signal Timing and Transit Priority Treatment</td>
<td>I-84</td>
<td>Gislan</td>
<td>Provide real time and forecasted traveler information on arterial roadways including current roadway conditions, congestion information, travel times, incident information, construction work zones, current weather conditions and other events that may affect traffic conditions. Transit/Enhanced Transit Corridor supportive project.</td>
<td>$3,983,100</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>System Management (Technology)</td>
<td>Gresham</td>
<td>181st/182nd - Gislan to Powell: ACM with Transit Priority Treatment</td>
<td>Gislan</td>
<td>Powell</td>
<td>Includes the ACM project with transit signal priority added to traffic signals along a facility.</td>
<td>$4,252,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Transportation System Management (Technology)</td>
<td>Multnomah County</td>
<td>Gresham</td>
<td>Gresham</td>
<td>11264</td>
<td>US 26 - Portland to Gresham: Roadside Travel Time Information</td>
<td>Portland</td>
<td>Gresham</td>
<td>Provide real-time traveler information on westbound US 26 for different routes (arterial and freeway) between Portland and Gresham. The project or a portion of the project is outside the designated urban growth boundary.</td>
<td>$1,169,300</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Transportation System Management (Technology)</td>
<td>Multnomah County</td>
<td>Multnomah County</td>
<td>Multnomah County</td>
<td>11300</td>
<td>238th/242nd Ave/Hogan Dr.: ACM with Adaptive Signal Timing</td>
<td>Sandy</td>
<td>Palmquist</td>
<td>Improve arterial corridor operations by expanding traveler information and upgrading traffic signal equipment and timings and making intersection improvements to lanes - includes the ACM project with signal systems that automatically adapt to current arterial roadway conditions.</td>
<td>$4,889,800</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Transportation System Management (Technology)</td>
<td>Multnomah County</td>
<td>Multnomah County</td>
<td>Multnomah County</td>
<td>11299</td>
<td>257th/Kane Dr.: Arterial Corridor Management (ACM) w/ Adaptive Signal Timing</td>
<td>I-84</td>
<td>Orient Dr.</td>
<td>Install upgraded traffic signal controllers, establish communications to the central traffic signal system, provide arterial detection (including bicycle detection where appropriate) and routinely update signal timings. Provide real-time and forecasted traveler information on arterial roadways including current roadway conditions, congestion information, travel times, incident information, construction work zones, current weather conditions and other events that may affect traffic conditions.</td>
<td>$2,976,400</td>
<td>2028-2040</td>
<td>Yes</td>
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<td>Transportation System Management (Technology)</td>
<td>Multnomah County</td>
<td>Multnomah County</td>
<td>Multnomah County</td>
<td>11297</td>
<td>NE 207th Ave.: Arterial Corridor Management (ACM)</td>
<td>Sandy</td>
<td>Glisan</td>
<td>Install upgraded traffic signal controllers, establish communications to the central traffic signal system, provide arterial detection (including bicycle detection where appropriate) and routinely update signal timings. Provide real-time and forecasted traveler information on arterial roadways including current roadway conditions, congestion information, travel times, incident information, construction work zones, current weather conditions and other events that may affect traffic conditions.</td>
<td>$1,647,650</td>
<td>2028-2040</td>
<td>No</td>
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<tr>
<td>Transportation System Management (Technology)</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10213</td>
<td>Airport Way ITS</td>
<td>I-205</td>
<td>NE 158th Ave</td>
<td>Install ITS infrastructure (communication network, enhanced bus detection, truck priority detection, Bluetooth detection, CCTV cameras, and vehicle/pedestrian detectors). These ITS devices allow us to provide more efficient and safe operation of our traffic signal system consistent with our policies of moving people and goods more effectively.</td>
<td>$1,500,000</td>
<td>2018-2027</td>
<td>Yes</td>
</tr>
<tr>
<td>Transportation System Management (Technology)</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10342</td>
<td>Columbia Blvd Corridor ITS Improvements</td>
<td>N Burgard St</td>
<td>NE Killingsworth St</td>
<td>Corridor ITS Improvements to improve freight operations. Communications infrastructure including closed circuit TV cameras, truck priority detection, variable message signs for remote monitoring and control of traffic flow for six signals.</td>
<td>$5,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<td>Transportation System Management (Technology)</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>11796</td>
<td>Going St Connected/Automated Vehicle Connection</td>
<td>Swan Island Industrial Area</td>
<td>I-5</td>
<td>Design and construct a Connected/Automated Vehicle connection between Swan Island and I-5.</td>
<td>$5,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Transportation System Management (Technology)</td>
<td>Portland</td>
<td>Portland</td>
<td>Portland</td>
<td>10266</td>
<td>I-405 Corridor ITS Improvements</td>
<td>SW Clay</td>
<td>NW Glisan</td>
<td>ITS improvements at six signals between Clay and Glisan including communications infrastructure; closed circuit TV cameras, variable message signs for remote monitoring and control of traffic flow.</td>
<td>$1,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
</tr>
<tr>
<td>Transportation System Management (Technology)</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>10346</td>
<td>Marine Drive ITS</td>
<td>N Portland Rd.</td>
<td>NE 185th Ave.</td>
<td>Install ITS infrastructure (communication network, enhanced bus detection, truck priority detection, Bluetooth detection, CCTV cameras, and vehicle/pedestrian detectors). These ITS devices allow us to provide more efficient and safe operation of our traffic signal system consistent with our policies of moving people and goods more effectively.</td>
<td>$1,500,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<td>Transportation System Management (Technology)</td>
<td>Multnomah County</td>
<td>Portland</td>
<td>Portland</td>
<td>12086</td>
<td>Portland Arterial Network TSM Improvements</td>
<td>Citywide</td>
<td>Citywide</td>
<td>Implement Transportation System Management (TSM) improvements on arterial streets to better manage traffic flow and provide greater priority to transit and freight movement.</td>
<td>$25,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
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Adopted by the Metro Council on 12/6/18.

Visit the 2018 RTP website for more information at: [oregonmetro.gov/rtp](http://oregonmetro.gov/rtp)
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<th>RTP Investment Category</th>
<th>County</th>
<th>Nominating Agency</th>
<th>Primary Facility Owner</th>
<th>RTP ID</th>
<th>Project Name</th>
<th>Start Location</th>
<th>End Location</th>
<th>Description</th>
<th>Estimated Cost</th>
<th>Time Period</th>
<th>Included in Financially Constrained project list?</th>
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<td>Portland</td>
<td>10373</td>
<td>Rivergate ITS</td>
<td>N Lombard St</td>
<td>Rivergate Industrial Area</td>
<td>Install ITS infrastructure [communication network, enhanced bus detection, truck priority detection, Bluetooth detection, CCTV cameras, and vehicle/pedestrian detectors]. These ITS devices allow us to provide more efficient and safe operation of our traffic signal system consistent with our policies of moving people and goods more effectively.</td>
<td>$1,000,000</td>
<td>2018-2027</td>
<td>Yes</td>
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<tr>
<td>Transportation System Management (Technology)</td>
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<td>Washington County</td>
<td>ODOT</td>
<td>11454</td>
<td>Jackson School Road Traffic Signal</td>
<td>US 26 and Jackson School Road</td>
<td></td>
<td>Signalize ramp intersections.</td>
<td>$1,100,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<td>Active Transportation</td>
<td>Clackamas County</td>
<td>Clackamas County</td>
<td>Clackamas County</td>
<td>10022</td>
<td>82nd Drive Bike and Pedestrian Improvements</td>
<td>Evelyn</td>
<td>Herbert Court</td>
<td>Improve safety for bicyclists and pedestrians by implementing proven safety counter measures and filling gaps in bikeways and pedestrian facilities.</td>
<td>$1,701,580</td>
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<td>Clackamas County</td>
<td>Clackamas County</td>
<td>11772</td>
<td>Clackamas Industrial Area Bike/Ped Improvements (TSAP)</td>
<td>Intersection of 106th Ave and OR 212</td>
<td>Intersection of Jennifer Rd and 122nd Ave</td>
<td>Improve intersection of 106th and OR 212, and Jennifer Drive and 122nd Ave to facilitate bike and pedestrian safety per county adopted TSAP, and provide ADA accessibility improvements as needed. Also improve intersection geometry to facilitate truck access to industrial park.</td>
<td>$2,000,000</td>
<td>2028-2040</td>
<td>Yes</td>
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<td>Portland</td>
<td>Portland</td>
<td>11804</td>
<td>Cully to Columbia Connector</td>
<td>NE Portland Hwy</td>
<td>NE Columbia Blvd</td>
<td>Upgrade Cully Blvd to include curbs, drainage, sidewalks, and bike lanes. Improve safety for all modes at railroad crossing.</td>
<td>$4,000,000</td>
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<td>Hillsboro</td>
<td>Hillsboro</td>
<td>11145</td>
<td>Airport Rd Bike/Ped Gaps</td>
<td>Brookwood Pkwy</td>
<td>48th Ave</td>
<td>Complete missing bike lanes and sidewalk</td>
<td>$1,594,500</td>
<td>2028-2040</td>
<td>No</td>
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<td>RTP Investment Category</td>
<td>County</td>
<td>Nominating Agency</td>
<td>Primary Facility Owner</td>
<td>RTP ID</td>
<td>Project Name</td>
<td>Start Location</td>
<td>End Location</td>
<td>Description</td>
<td>Estimated Cost (2016 dollars)</td>
<td>Time Period</td>
<td>Included in Financially Constrained project list?</td>
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<td>Active Transportation</td>
<td>Washington County</td>
<td>Wilsonville</td>
<td>Washington County</td>
<td>11798</td>
<td>Eligsen Road Urban Upgrade</td>
<td>Parkway Center Drive</td>
<td>65th</td>
<td>Reconstruct street to 3 lanes with buffered bike lanes and sidewalks (TSP project UU-P3). The project will install sidewalks and bike lanes to remove bikes and pedestrians from vehicle travel lanes. The project has had two serious crashes.</td>
<td>$6,000,000</td>
<td>2028-2040</td>
<td>No</td>
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APPENDIX B

REGIONAL FREIGHT AND GOODS MOVEMENT TASK FORCE MEMBERS

Engaging stakeholders to develop a regional freight plan

The center point for the engagement of stakeholders was the Metro Council-appointed Regional Freight and Goods Movement Task Force. The 33-member task force included representatives from the multimodal freight industry, community and government agencies. The group was charged with guiding the formation of policy and strategy recommendations for the region’s multimodal freight transportation system. Metro Councilor Rod Park served as chairperson for the task force. The list of members included:

- **Steve Akre**
  - OIA Global Logistics
- **Tom Dechenne**
  - Norris, Beggs & Simpson
- **Susie Lahnse**
  - Port of Portland
- **Paul Smith**
  - City of Portland
- **Grant Armbruster**
  - Columbia Sportswear
- **John Drew**
  - Far West Fibers
- **Brian McMullen**
  - WSDOT
- **John Speight**
  - Portland & Western RR
- **Steve Bates**
  - Redmond Heavy Haul
- **Ann Gardner**
  - Schnitzer Steel Industries
- **Jeanne Morgan**
  - Xerox
- **Paul Thalhofer**
  - City of Troutdale
- **Scott Bricker**
  - Bicycle Transportation Alliance
- **Pete George**
  - PW George Consulting
- **James Nave**
  - Union Pacific RR
- **Jason Tell**
  - ODOT
- **Katy Brooks**
  - Port of Vancouver
- **Cam Gilmour**
  - Clackamas County
- **Rod Park**
  - Metro Council
- **Elizabeth Wainwright**
  - Merchants Exchange
- **Gary Cardwell**
  - NW Container Service
- **Van Hooper**
  - Sysco Foods
- **Michael Powell**
  - Powell’s Books
- **Tracy Ann Whalen**
  - ESCO Corporation
- **Terry Cleaver**
  - Columbia Grain
- **Tom Hughes**
  - City of Hillsboro
- **Warren Rosenfeld**
  - Calbag Metals
- **Rick Williams**
  - Lloyd District TMA
- **Lynda David**
  - Southwest Washington RTC
- **Monica Isbell**
  - Starboard Alliance
- **Robert Russell**
  -

The RFGM Task Force met 11 times between July 2006 and October 2007. Additionally, the task force worked in ad hoc subcommittees to tackle specific issues, such as a regional vision for freight, freight-related RTP goals and objectives, and project prioritization criteria, and brought back recommendations to the full task force. Task Force members also participated in a combined Metropolitan Policy Advisory Committee and Joint Policy Advisory Committee on Transportation meeting held in October 2007.
The long-standing Metro committee on regional freight coordination, the Regional Freight Advisory Committee, served as the technical advisory committee on this plan, providing data, input on analysis, and review of memorandums and reports. The committee is loosely comprised of transportation agencies in the region with an interest in freight issues. Active participants include:

- Oregon Department of Transportation
- Washington County
- Washington Department of Transportation
- Multnomah County
- Metro
- City of Gresham
- Southwest Washington Regional Transportation Council
- City of Milwaukie
- Port of Portland
- City of Portland
- Port of Vancouver
- City of Tualatin
- FHWA
- City of Wilsonville
- Clackamas County
APPENDIX C

METRO FREIGHT MODEL

FREIGHT MODEL SUMMARY

This purpose of the Freight Demand Modeling and Data Improvement Project was to replace the current trip-based truck model developed by Metro that utilizes fixed commodity flows with a truck tour model designed to reflect decisions made by shippers, receivers, truck operators, terminal managers, and others. The model simulates movement of individual shipments throughout the supply chain, including both direct shipments and those that travel through transshipment facilities. Shipments are allocated to trucks of various classes, and the movements of all freight vehicles are simulated over the course of a typical weekday.

Key participants in the project included Metro, the Oregon Department of Transportation (ODOT), the Port of Portland and local agencies throughout the region.

The objectives of the project were to:

- Develop tools to enable a more comprehensive analysis of infrastructure needs and policy choices pertaining to the movement of goods;
- Develop more detailed network assignments by truck type to support regional environmental analysis, as well as local traffic operations and engineering analysis;
- Develop freight forecasts that are responsive to changes in economic forecasts, changing growth rates among industrial sectors, and changing rates of economic exchange and commodity flows between sectors; and
- Replace the trip-based truck model with a more realistic tour-based model.

2.1 Current Metro Models

Metro has deployed commodity-flow based truck models for almost 20 years. These models have utilized data based on the Freight Analysis Framework (FAF) and prepared under contract for Metro and the Ports of Portland and Vancouver. The current model is based on FAF3, which utilized data gathered in the 2007 Commodity Flow Survey (CFS), together with data from several other sources.

Commodities are grouped into 16 categories and assigned to major “gateways” by long-haul mode and direction. Long-haul truck-borne commodities enter and exit at major highway cordons. The commodities are segmented by carrier type (private, common carrier, truckload, and LTL). A portion of the commodities in each group is routed through warehouse, distribution, and consolidation facilities based on a 2006 survey. They are distributed to individual Transportation Analysis Zones (TAZ's) based on employment types associated with each group and then assigned to medium and heavy vehicles based on load factors. External-internal and internal-external truck flows are derived by designating
a portion of the truck volumes at each external station as through trips in accordance with
the 2006 survey.

Daily heavy and medium truck trips are factored into time periods using data from a region-
wide truck count database. The trips are factored to passenger-car-equivalents and
assigned to the network using multi-class assignment techniques. The current truck model
does not include local delivery vehicles or non-freight commercial vehicles, and there is no
feedback of network travel costs into the model.

Metro’s current trip-based passenger model, code-named “Kate,” was estimated in 2016 and
calibrated and validated in the spring of 2017. The main model inputs are households by
size, income, and life cycle; and employment by sector. A series of demographic models is
used to estimate household attributes not included in the inputs, such as the number of
workers, number of school age children, and number of household vehicles. Fixed trip
generation rates are assigned to households based on specific attributes (e.g., persons,
workers, and age of head of household) for eight trip purposes. Destination choice for
home-based work trips is further segmented into three income classes. The mode choice
model assigns seven travel modes - drive alone, drive-with-passenger, auto passenger,
walk-to-transit, drive-to-transit, walk, and bike. The drive alone and drive-with-passenger
modes are assigned to the network as SOV and HOV vehicles, respectively. Public transit
sub modes (bus, LRT, streetcar, commuter rail) are determined in the transit assignment
path choice, but are not segmented in the demand model. There is full feedback and
equilibration of the demand model (destination choice, mode choice, and assignment path
choice) with auto network costs.

There is a separate airport model that estimates person-trips to Portland International
Airport for all purposes and modes, a separate bicycle route choice model that interacts
with mode choice, and a special events model that is used for certain types of transit
studies.

2.2 Model User Needs

Early in the study, a series of stakeholder interviews were held with potential users of the
freight model output to identify key freight-related issues and challenges, important
impacts to measure for decision-making, expected use of a freight model or outputs, and the
level of interest in freight model development from their perspective. The stakeholder
groups were:

- Metro
- ODOT
- Port of Portland
- Local agencies
- Portland Freight Committee
The key freight-related issues and challenges identified by the groups include the following:

- Multimodal analysis (rail, air, water, pipeline) in addition to truck;
- Local truck movements for pick-up and delivery (last mile connections and congestion);
- Impacts of distribution centers (new and existing) and industrial land development;
- Economic impacts of freight; and
- Operational impacts of local truck movements (reliability, road diets and impacts to bike/pedestrian movements).

The model addresses all of these issues, except pipeline transport, either directly or indirectly. Pipeline movements could be added to the mode choice models in future enhancements. Other issues, such as economic and operational impacts, will require additional tools which Metro may choose to develop.

The stakeholder groups also identified a set of impacts which will be important to measure:

- Shifts in imports and exports (representing global shifts in freight to the U.S.);
- Shifts in national commodity flow movements due to Portland improvement projects;
- Greenhouse gas (GHG) emissions;
- Roadway operational improvements;
- Rail capacity and speed improvements;
- Shifts in transloading at the Ports of Portland and Vancouver;
- Distribution of oil arriving by pipeline; and
- Economic benefits of freight movements.

The model represents imports and exports, but does not explicitly model global freight movements, so the impacts of global changes could be represented by adjusting these inputs as a scenario analysis. Operational analysis would benefit from integrating truck movements produced by the model with an operational model, such as VISSIM, capable of evaluating localized operational improvements. Although pipelines are not included directly in the model, the distribution of oil to consumers arriving by pipeline to the port is represented by truck movements.

The stakeholder interviews were also used to identify how the model or its outputs might be used by the various groups. The responses focused on the ability to evaluate possible investments or policies to improve freight mobility and the need to communicate the freight movement story to decision-makers and the public.
2.3 Model Overview

Figure 1 shows the integrated model system containing Metro’s passenger travel demand models (gray boxes) that are used to estimate personal travel by auto and other modes. The freight and commercial vehicle travel demand models being developed in this SHRP 2 C20 project are shown in orange, with the output datasets shown in blue.

Figure 1. Integrated Freight Model System
There are three primary modeling systems that comprise the Metro freight model:

- The **national supply chain model** simulates the transport of freight between supplier and buyer businesses in the United States, in this case focusing on movements that involve Portland. Its output, a list of commodity shipments by mode, is used in two ways. First, in the Metro model, a model component connected to the national supply chain model converts the annual shipment flows to daily vehicle trip tables that can be assigned to the regional highway network in Metro’s model, along with trips tables from the passenger model. Secondly, as indicated by the blue arrow, the list of commodity shipments by mode is extracted from the supply chain model and used as an input to the freight truck touring model.

- The **freight truck-touring model** simulates truck movements within the Portland region that deliver and pick up freight shipments at business establishments. The model is a tour-based model, and builds a set of truck tours including transfer points at which the shipment is handled before delivery/after pickup for shipments with a more complex supply chain (i.e., a warehouse, distribution center, or consolidation center) and the suppliers and buyer of shipments where those are within the model region. The shipment list from the national supply chain model is used as the demand input for the freight truck touring model and describes the magnitude and location of delivery and pick up activity in the region that must be connected by truck movements. The model will generate trip lists by vehicle type and time of day so that the outputs from this model can be combined with the outputs from the commercial services touring model and appropriate trip tables from Metro’s passenger model for highway assignment.

- The **commercial services touring model** simulates the remainder of the travel of light, medium, and heavy trucks that is for commercial purposes, i.e., providing services and goods delivery to households and services to businesses. As with the freight truck touring model, the commercial services touring model is a tour-based model, but this time demand is derived from the characteristics of the business establishments and households in the region and as such is not affected by the national supply chain model. That is, while the freight truck touring model simulates truck tours based on commodity flows, the commercial services touring model generates and simulates truck and light-duty vehicle movements based on demand for services and goods from the region’s industries.

For each of these model systems, we describe the analytical engine, the input and output databases, and the integration of the models into Metro’s regional travel demand modeling system (trip-based model, “Kate” version).

The outputs from both the freight truck touring model and the commercial services touring model are lists of truck trips and tours and are aggregated to represent trip tables. In this case, a trip list from each model with trip start and end location and trip timing information is aggregated into zone to zone trips by time period that can be assigned to the
2.4 Model Development Process

2.4.1 Implementation Plan

To guide the model development process, an implementation plan was developed detailing the initial demonstration model transfer, software requirements, integration with the current Metro travel models, external linkages, and desired enhancements/customizations of the model. The questions considered in the plan included:

- Extent to which the freight model would be integrated with Metro’s passenger travel demand modeling system;
- Maintenance of the model and its data elements, including possible coordination with external partners such as the Ports and ODOT;
- Integration of the truck touring model with a national supply chain model approach;
- Sensitivity to long-haul movements across the U.S. for shipments that travel to, from or through Portland;
- Resources available in the project to implement the supply chain model components;
- Resources needed to acquire and maintain necessary data inputs, both initially and in the future; and
- Software and hardware requirements, tailored to meet Metro’s freight model performance objectives and staff capabilities.

2.4.2 Data Plan

A data plan was developed to identify data needs and how they would be met in fulfillment of project objectives, as developed through Metro staff discussion and the stakeholder interviews. The data plan was intended to identify currently available data and a flexible set of options to accommodate Metro’s approach to model integration and data collection funding. The freight model required three types of data to support model development and application:

- Behavioral data for model estimation;
- Observed travel data outcomes for model calibration and validation; and
- Model input data describing transport networks and zone systems, warehousing and major distribution facilities, employment/establishments, households, supply chain relationships and national commodity flows.

The behavioral and observed travel data was required for the development of the working updated model. The model input data was needed for implementation of the working enhanced demonstration model.
2.4.3 Data Collection

The final data plan was implemented to collect and prepare the required data for model estimation, calibration, and validation. The behavioral data collection for model estimation comprised the following tasks:

- Design of truck travel diary survey questionnaire;
- Development of survey tools, including an online survey application (rSurvey) and a mobile survey application (rMove);
- Development of a survey sampling plan, including holding focus group meetings to obtain information to guide the plan development and introduce prospective survey participants to the project;
- Survey recruitment;
- Survey data collection, including the development and hosting of a project website, conducting a pilot survey, and conducting the full survey; and
- Processing and summarization of the survey data.

The observed travel data for model calibration and validation consisted of truck counts and commodity flow survey data. The truck count data was used for the development of the truck touring model, while the commodity flow data was used both as input data for the supply chain model and setting calibration targets for the supply chain model. The following steps were involved in the truck count data collection:

- Compilation of raw count data;
- Initial data checking;
- Count adjustment;
- Aggregation of counts to model time periods and vehicle classifications;
- Import of data to GIS;
- Import of data to model network; and
- Final data checking

The commodity flow data was derived from the Freight Analysis Framework by Metro. As specified in the data plan, the model input data consisted of the commodity flow data, industry input-output tables, zone systems, networks, employment data, and TAZ household data by Metro. These are discussed in Section 3.3.
2.4.4 Model Development Approach

The Portland freight model is based on a combined supply chain and tour-based framework developed with Federal Highway Administration research funding by RSG and implemented in Chicago, Florida, Piedmont and Baltimore with rFreightTM software. This framework is comprised of several steps that simulate the transport of freight between each supplier and buyer business in the United States with additional imports and exports from international businesses.

Supply Chain Models

Figure 2 shows these supply chain processes, with major input and output data identified. The steps are introduced in this section and further detail is provided in Section 4 on model development. The modeling system includes the selection of business locations, trading relationships between businesses, and the resulting commodity flows, distribution channel, shipment size and mode and path choices for each shipment made annually:

1. Firm Synthesis. Synthesizes all firms in the United States and a sample of international firms
2. Supplier Firm Selection. Selects supplier firms for each buyer firm by type
3. Goods Demand. Predicts the annual demand in tonnage for shipments of each commodity type between each firm in the United States
4. Firm Allocation. Allocates firms in each county to traffic analysis zones within the Portland region
5. Distribution Channels. Predicts the level of complexity of the supply chain (e.g., whether it is shipped directly or whether it passes through one or more warehouses, intermodal centers, distribution centers, or consolidation centers)
6. Shipment Size and Frequency. Estimates discrete shipments delivered from the supplier to the buyer
7. Modes and Transfers. Predicts four primary modes (road, rail, air, and waterway) and transfer locations for shipments with complex supply chains
Figure 2. National Supply Chain Model Structure
The model incorporates a multimodal transportation network that provides supply side information to the model including costs for different paths by different modes (or combinations of modes). While the model is focused on Oregon and Portland, it also encompasses freight flows between Oregon and the rest of the world. The rail, air and waterway freight movements are not assigned in the current work. The highway assignments are described below as part of the truck touring model process.

The supply chain models were transferred from the Baltimore/Maryland model and calibrated using the locally collected data sources. The primary purpose of the supply chain models in the Portland freight model is to produce individual shipments of goods into, out of, and through the Portland region. These models were calibrated to achieve reasonable external flows by mode. The model components of the supply chain were not calibrated individually, since the focus of the project is on the tour-based models in the Portland region.

The supply chain models rely on commodity flow forecasts, so adjustments to growth forecasts need to be translated into adjustments to commodity flow forecasts for scenario analysis or evaluation of different growth forecasts. A separate model component for procurement markets (that RSG has developed) could be deployed as an enhancement to allow a more structured scenario analysis of growth forecasts, but this is not part of the current work. This modeling framework does provide for the future inclusion of this procurement market game model and is currently an element of exploratory research at the FHWA.

**Truck Touring Models**

The supply chain model is integrated with a regional truck touring model, which is a sequence of models that takes shipments from their last transfer point to their final delivery point. The integrated modeling system connects the national supply chain models with the regional truck touring models. The final transfer point is the last point at which the shipment is handled before delivery (i.e., a warehouse, distribution center, or consolidation center for shipments with a more complex supply chain or the supplier for a direct shipment). It performs the same function in reverse for shipments at the pick-up end, where shipments are taken from the supplier to distances as far as the first transfer point. For shipments that include transfers, the tour-based truck model accounts for the arrangement of delivery and pick-up activity of shipments into truck tours.

A commercial services touring model is also developed to provide a comprehensive representation of all trucks. This model has the same structure and features of the regional truck touring model, but demand is generated from businesses and households in the region rather than from goods movement. These commercial services include utilities, business and personal services.

The regional freight truck and commercial vehicle touring models were transferred from the work done in Baltimore. These were calibrated and validated using locally collected data.
The model produces trip lists for all the freight delivery trucks and commercial vehicles in the region that can be assigned to a transportation network. The truck touring model components predict the elements of the pick-up and delivery system within the Portland region through several modeling components, as shown in Figure 3:

1. **Vehicle and tour pattern choice.** Predicts the joint choice of whether a shipment is delivered on a direct- or a multi-stop tour and the size of the vehicle that makes the delivery.

2. **Number of tours and stops.** Predicts the number of multi-stop tours required to complete all deliveries and estimates the number of shipments that the same truck delivers.

3. **Stop sequence and duration.** Sequences the stops in a reasonably efficient sequence but not necessarily the shortest path. Predicts the amount of time taken at each stop based on the size and commodity of the shipment.

4. **Delivery time of day.** Predicts the departure time of the truck at the beginning of the tour and for each subsequent trip on the tour.

The Portland freight model is integrated with the passenger travel model for highway assignment and can become part of the Portland travel demand modeling system.
Figure 3. Truck Touring Model Steps
Metro Policy Advisory Committee (MPAC)

Denny Doyle, City of Beaverton, MPAC Chair
Larry Morgan, City of Troutdale, MPAC Vice Chair
Emerald Bogue, Port of Portland
Steve Callaway, City of Hillsboro
Sam Chase, Metro Council
Chloe Eudaly, City of Portland
Betty Dominguez, Metro Council
Andy Duyck, Washington County
Maxine Fitzpatrick, Multnomah County citizen
Amanda Fritz, City of Portland
Mark Gamba, City of Milwaukie
Linda Glover, City of Vancouver
Ed Gronke, Clackamas County citizen
Jeff Gudman, City of Lake Oswego
Kathryn Harrington, Metro Council
Jerry Hinton, City of Gresham
Brian Hodson, City of Canby
Gordon Hovies, Tualatin Valley Fire & Rescue
Teri Lenahan, City of North Plains
Renate Mengelberg, City of Oregon City
Luis Nava, Washington County citizen
Nathan Phelan, Peninsula Drainage District #1
Craig Prosser, TriMet
Jim Rue, Oregon Dept. of Land Conservation and Development
Martha Schrader, Clackamas County
Loretta Smith, Multnomah County
Jeanne Stewart, Clark County
Don Trotter, Clackamas County Fire District #1
Peter Truax, City of Forest Grove
Mark Watson, Hillsboro School District Board of Directors

Joint Policy Advisory Committee on Transportation (JPACT)

Craig Dirksen, Metro Council, JPACT Chair
Shirley Craddick, Metro Council, JPACT Vice Chair
Shane Bemis, City of Gresham
Nina DeConcini, Oregon Dept. of Environmental Quality
Denny Doyle, City of Beaverton
Doug Kelsey, TriMet
Tim Knapp, City of Wilsonville
Anne McEnerny-Ogle, City of Vancouver
Curtis Robinhold, Port of Portland
Roy Rogers, Washington County
Chloe Eudaly, City of Portland
Paul Savas, Clackamas County
Bob Stacey, Metro
Jeanne Stewart, Clark County
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Rian Windsheimer, Oregon Dept. of Transportation

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Ben Kahn, intern
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Tim O’Brien, principal planner
Jeff Raker, economic development planner
Eliot Rose, senior technology and transportation planner
Jamie Snook, principal transportation planner
Julie Stringham, principal transportation planner
Caleb Winter, senior transportation planner
If you picnic at Blue Lake or take your kids to the Oregon Zoo, enjoy symphonies at the Schnitz or auto shows at the convention center, put out your trash or drive your car – we’ve already crossed paths.

**So, hello. We’re Metro – nice to meet you.**

In a metropolitan area as big as Portland, we can do a lot of things better together. Join us to help the region prepare for a happy, healthy future.

**Metro Council President**  
Tom Hughes

**Metro Councilors**  
Shirley Craddick, District 1  
Betty Dominguez, District 2  
Craig Dirksen, District 3  
Kathryn Harrington, District 4  
Sam Chase, District 5  
Bob Stacey, District 6

**Auditor**  
Brian Evans

Stay in touch with news, stories and things to do.  
oregonmetro.gov/news

If you have a disability and need accommodations, call 503-220-2781, or call Metro’s TDD line at 503-797-1804. If you require a sign language interpreter, call at least 48 hours in advance.

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2018 Regional Transportation Plan

**safe • reliable • healthy • affordable**

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