



PUBLIC REVIEW DRAFT

2018 Regional Transportation Plan

*A blueprint for the future of transportation
in the greater Portland region*

June 29, 2018

oregonmetro.gov/rtp

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Metro is the federally mandated metropolitan planning organization designated by the governor to develop an overall transportation plan and to allocate federal funds for the region.

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.

Project web site: oregonmetro.gov/rtp

The preparation of this report 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 report are not necessarily those of the U.S. Department of Transportation, Federal Highway Administration and Federal Transit Administration.

2018 Regional Transportation Plan



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PUBLIC REVIEW DRAFT

2018 Regional Transportation Plan

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Foreword

This section provides short introduction to the Regional Transportation Plan from Council President Hughes.

Executive Summary

This section provides an overview of the plan, how it was developed, key trends and challenges it will address and the outcomes it will deliver. The executive summary will also be produced as a standalone document.

Note: This section is under development and will be included in final RTP.

Chapter 1 | Toward a Connected Region

This chapter introduces the greater Portland region and Metro's role in transportation planning. The chapter discusses the role of the plan in implementing the 2040 Growth Concept and the Climate Smart Strategy and addressing regional, state and federal requirements, and its relationship to other plans and strategies. This chapter summarizes the public process that shaped development of the plan.

Chapter 2 | Our Shared Vision for Transportation

This chapter presents the plan's aspirational vision for the region's transportation system. The vision is further described through goals, objectives and performance targets that reflect the values and desired outcomes expressed by the public, policymakers and community and business leaders engaged in development of the plan. This outcomes-based policy framework guides future planning and investment decisions as well as monitoring plan implementation.

Chapter 3 | Transportation System Policies to Achieve Our Vision

This chapter defines a broad range of policies for safety, equity, climate, design and emerging technology as well as the vision and policies for the modal networks of the regional transportation system – motor-vehicle, transit, freight, bike and pedestrian. The policies will help the region make progress toward the plan's vision, goals and objectives for the regional transportation system. Together the policies will guide the development and implementation of the regional transportation system, informing transportation planning and investment decisions made by the Joint Policy Advisory Committee on Transportation (JPACT) and the Metro Council.

Chapter 4 | A Snapshot of Our Growing and Changing Region

This chapter provides a snapshot of current regional growth trends and existing conditions and outlines key transportation challenges the plan will address. The chapter also highlights opportunities for building a regional transportation system that reflects our values and vision for the future.

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Note: This appendix is under development and will be included in final RTP Appendices.
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- Appendix N. Southwest Corridor Project Locally Preferred Alternative (scheduled for adoption in Dec. 2018)
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- Appendix R. I-5/99W Connector Study Recommendations and Conditions (adopted in Feb. 2009 by Project Steering Committee)
- Appendix S. I-5/Columbia River Bridge Replacement Locally Preferred Alternative (adopted in July 2008)
- Appendix T. RTP Amendment Process - Request Form and Checklist
Note: This appendix is under development and will be included in final RTP Appendices.

TOPICAL AND MODAL PLANS AND SUPPORTING DOCUMENTS*

- Regional Transportation Safety Strategy (scheduled for adoption in Dec. 2018)
- Metro State of Safety Report (completed in Jan. 2018)
- Regional Emerging Technology Strategy (scheduled for adoption in Dec. 2018)
- Regional Freight Strategy (scheduled for adoption in Dec. 2018)
- Regional Transit Strategy (scheduled for adoption in Dec. 2018)
- Regional Travel Options Strategy (scheduled for adoption in May 2018)
- Portland Region 2016 Traffic Performance Report (prepared by ODOT Region 1 in June 2017)
- Climate Smart Strategy (adopted in Dec. 2014)
- Regional Active Transportation Plan (adopted in July 2014)
- Regional Transportation System Management and Operations Strategic Plan (adopted in Aug. 2010)

* Supporting documents were adopted by the Metro Council and Joint Policy Advisory Committee on Transportation (JPACT), unless otherwise noted.

Foreword: from the Metro Council President



These are remarkable and challenging times for the greater Portland region. We continue to attract new residents, jobs and industries. Our communities are becoming more culturally diverse, bringing rich cultural activity to neighborhoods. A new generation is growing to adulthood as others move toward retirement. Advances in technology are changing how we connect, how we work, and increasingly, how we travel, move goods and provide services. As population increases in the region, we find ourselves facing new challenges—regionally and globally—and are beginning to recognize longstanding issues facing

communities that have been marginalized. These changes and challenges impact how we use and what we expect from our transportation system.

Every resident and business – those with roots in the region that run generations deep to new residents – have a stake in our system of highways, roads, bridges, sidewalks, bikeways and transit and freight routes. This Regional Transportation Plan is accountable to each of them. Through the update of this plan we have built new partnerships to bring new voices to the process and focused our efforts to make more near-term progress on these regional priorities – equity, safety, travel options and congestion.

We are facing new and longstanding challenges

The greater Portland region is facing global and regional challenges. As more and more people come to our region to enjoy the things that have contributed to our high quality of life, that high quality of life is at risk. Congestion, maintenance needs and safety issues are expected to grow as a half-million more people join the region by 2040.

At the same time, the climate is changing, and we need to continue to work for clean air and clean water. Systemic inequities mean that communities have not equally benefited from public policy and investments, and some perspectives have long been ignored or actively suppressed. The economy is changing, and the pace of technology increasing. Congestion is at an all-time

2018
REGIONAL
TRANSPORTATION
PLAN



Learn more about the 2018 Regional Transportation Plan and opportunities to provide feedback on the draft plan from June 29 through Aug. 13 at oregonmetro.gov/rtp.



The Metro Council consists of a president, elected regionwide, and six councilors who are elected by district every four years in nonpartisan races. The council works with community leaders and constituents across city and county boundaries to shape the future of the greater Portland region.

The Metro Council shares decision-making authority over regional transportation planning and policies with the Joint Policy Advisory Committee on Transportation, or JPACT, which comprises 17 members that serve as elected officials or representatives of transportation agencies across the region.

high on our system – a reflection of the pace at which people have moved here as well as where people live relative to where they work. In 2015, only one-third of workers in the region lived and worked in the same city.

Meanwhile, the funding gap between the needs of a growing region and an aging system of highways, transit, roads and bridges and an incomplete network of sidewalks, bikeways and transit routes continues to worsen. We need a plan that serves our growing and changing region – one that anticipates population and employment growth, our region’s changing demographics (including an aging population), the shifting nature of work, new transportation technologies and services, the impacts of pollution and climate change.

We have a vision for our future – and for how our transportation system will work

The plan sets out a vision that in the 21st century, our region has a continuously improving economy and shared quality of life with the foundation of a safe, reliable, healthy and affordable transportation system. A system that is well-maintained, environmentally responsible, efficiently moves products to market, and connects all people to the education and work opportunities they need to thrive and prosper.

More than \$42 billion is planned to be invested in the region’s transportation system over the next 25 years to serve our future population of over 2 million people. This Regional Transportation Plan identifies current and future transportation needs, priority investments to meet those needs, and federal, state, regional and local funding the region expects to have available through 2040. It lays out nearly \$27 billion in funding for maintenance, preservation, and operations of the transportation system. \$15 billion is planned for capital projects that optimize and expand the region’s highway and transit systems, improve access to freight destinations, complete gaps in biking and walking connections and regional trails that provide important access to transit, downtowns, schools, services and other community destinations.

The 2018 Regional Transportation Plan provides us an opportunity to move toward that vision

Decades of thinking ahead and implementing bold strategies to meet the transportation challenges of the 20th century has put the greater Portland region ahead of the curve. With a focus on a compact urban area, growth in town centers and along major roadways, efficient transit and options for

biking, walking and busing, the region has not dealt with the same crisis of gridlocked traffic, dependence on driving and freight delays of other growing regions. However, as our growth continues, we have to leverage and build upon our previous investments to ensure that new investments advance more equitable outcomes. Through this we can avoid a cresting dilemma like those faced by places like Los Angeles, Seattle and the Bay Area. This Regional Transportation Plan update builds on the tradition of multimodal investment and creative thinking to create partnerships that develop innovative and equitable solutions to the challenges we currently face now and in the future.

Delivering outcomes to build public trust

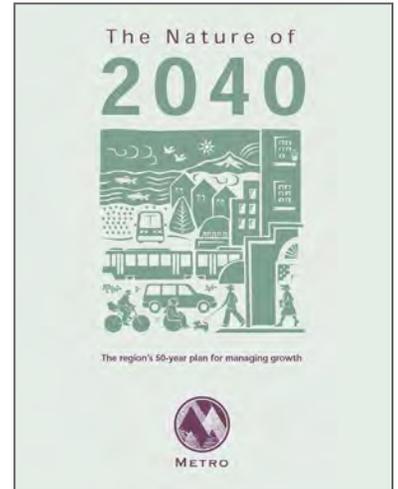
On behalf of the Metro Council, I invite you to review the Draft 2018 Regional Transportation Plan and supporting draft strategies for safety, transit, freight, and emerging technology that have been developed over the past 3 years. Together they represent the choices that we need to create an equitable transportation system that supports a high quality of life, a prosperous economy and a protected environment. I hope you agree that the planned investments demonstrate a wise use of resources and, if we choose to execute them, will result in a safe, reliable, healthy and affordable transportation system for all communities.

While the Draft 2018 Regional Transportation Plan and supporting strategies reflect an extensive amount of input and feedback already, these drafts will inform public engagement through the fall of 2018. The feedback received from residents, businesses, community organizations, jurisdictional partners and others will be incorporated into a final version of the Plan, which will be considered by the Metro Policy Advisory Committee and the Joint Policy Advisory Committee on Transportation in October prior to being submitted to the Metro Council for approval in December.

We look forward to hearing what you think!



Metro Council President Hughes



Find out about the 2040 Growth Concept, A land use and transportation strategy for building healthy, equitable communities and a strong economy, at oregonmetro.gov/2040.



The engagement activities produced more than 18,000 touch points with regional partners, community and business leaders and residents of the region to inform development of the draft 2018 Regional Transportation Plan.

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Chapter 1

Our Toward a Connected Region

June 29, 2018

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PURPOSE

Transportation planning means more than deciding where to build roads, sidewalks, bikeways and transit and freight routes. It's about taking care of what we have and building great communities.

It's about ensuring that no matter where you are or where you're going, you can have safe, reliable, healthy and affordable options to get there. It's about nurturing a strong economy, advancing equity and protecting the quality of life we all value.

Metro is the metropolitan planning organization (MPO) designated by Congress and the State of Oregon, for the Oregon portion of the Portland-Vancouver urbanized area, serving 1.5 million people living in the region's 24 cities and three counties. As the MPO, Metro formally updates the Regional Transportation Plan every five years in cooperation and coordination with the Oregon Department of Transportation and the region's cities, counties and transit agencies.

The Regional Transportation Plan is a blueprint to guide investments for all forms of travel – motor vehicle, transit, bicycle and walking – and the movement of goods and freight throughout the greater Portland region. The plan identifies the region's most urgent transportation needs and priorities for investment in all parts of the system with the funds the region expects to have available over the next 25 years to make those investments a reality. It also establishes goals and policies to help meet those needs and guide priority investments. More resources will be needed to achieve our vision and address the challenges of a growing, thriving region.

How we respond to these challenges today will set the course for generations to come. Since summer 2015, Metro has been working with local, regional and state partners and the public to update our region's shared transportation vision and investment strategy for the next 25 years. The updated RTP defines a safe, reliable, healthy and affordable transportation system that is environmentally responsible, efficiently moves products to market, and ensures all people can connect to the education and work opportunities they need to experience and contribute our region's economic prosperity and quality of life. The plan laid out in these pages, will take sustained, focused work from every partner in the region.



Learn more about the 2018
Regional Transportation Plan at
oregonmetro.gov/rtp

Chapter organization

This chapter is organized into the following sections:

- 1.1. Introduction:** This section broadly describes the Regional Transportation Plan and trends and challenges facing the region that were the focus of this update.
- 1.2. Geographic setting:** This section describes the geographic context of the Portland-Vancouver metropolitan region.
- 1.3. Metropolitan Transportation Planning Process:** This section describes Metro's role in transportation planning and planning areas of responsibility.
- 1.4. Process and Engagement Overview:** This section describes the timeline and process for developing the 2018 Regional Transportation.
- 1.5. What's Next Moving Forward:** This section provides a brief introduction to the rest of the plan.

1.1 INTRODUCTION

The 2018 Regional Transportation Plan will help make the case for more investment and funding to build, operate and maintain the regional transportation system we need for all modes of travel.

The 2018 Regional Transportation Plan defines a shared vision and investment strategy that guides investments for all forms of travel to keep people connected and commerce moving throughout the greater Portland region. The plan is updated every five years to stay ahead of future growth and address trends and challenges facing the region.

Our region is growing rapidly and straining our aging transportation system. A half-million new residents are expected to live in the Portland region by 2040 – about half from growing families. Our communities are becoming more culturally diverse, bringing rich cultural activity to neighborhoods. A new generation will grow to adulthood as others move toward retirement. Climate change is happening and our system is not prepared for the expected Cascadia Subduction Zone earthquake. We are experiencing technological changes in transportation that could radically alter our daily lives. Housing affordability and safe, reliable and affordable access to education, jobs and other important destinations are of concern.

Over the years, the diverse communities of the Portland metropolitan area have taken a collaborative approach to planning that has helped to make our region one of the most livable in the country. We have set our region on a wise course and experienced many successes. But, our treasured region and the planet face formidable challenges. The rapid growth and change across our region have exposed and exacerbated longstanding economic and racial inequities, threatening to undermine the broader benefits of economic growth as well as our region's quality of life. These inequities coupled with longer-term concerns around affordability, safety, climate change and growing congestion demand that we do things differently and make this update all the more timely.

The 2018 Regional Transportation Plan update provided policymakers, community and business stakeholders and the public with an opportunity to work together across interests and communities to bring innovative solutions to the challenges facing our changing region. It provided a platform for updating our shared vision for the transportation system and updating our policies, strategies and investment priorities to help ensure people and products can get where they need to go as congestion, safety and maintenance issues increasingly impact our daily lives.



Our region's economic prosperity and quality of life depend on a transportation system that provides every person and business with access to safe, reliable and affordable ways to get around.

1.2 GEOGRAPHIC SETTING

The Portland-Vancouver metropolitan region is part of the broader Pacific Northwest region, also called Cascadia. Shown in **Figure 1.1**, the Pacific Northwest encompasses most of British Columbia, Washington, Oregon and adjoining parts of Alaska, Montana and California.

Figure 1.1 Portland-Vancouver Metropolitan Region Geographic Context



Linked together by a rich and complex natural environment, abundant recreational opportunities and major metropolitan areas, the Pacific Northwest also serves as a global gateway for commerce and tourism, connecting to other Pacific Rim countries and the rest of the United States.

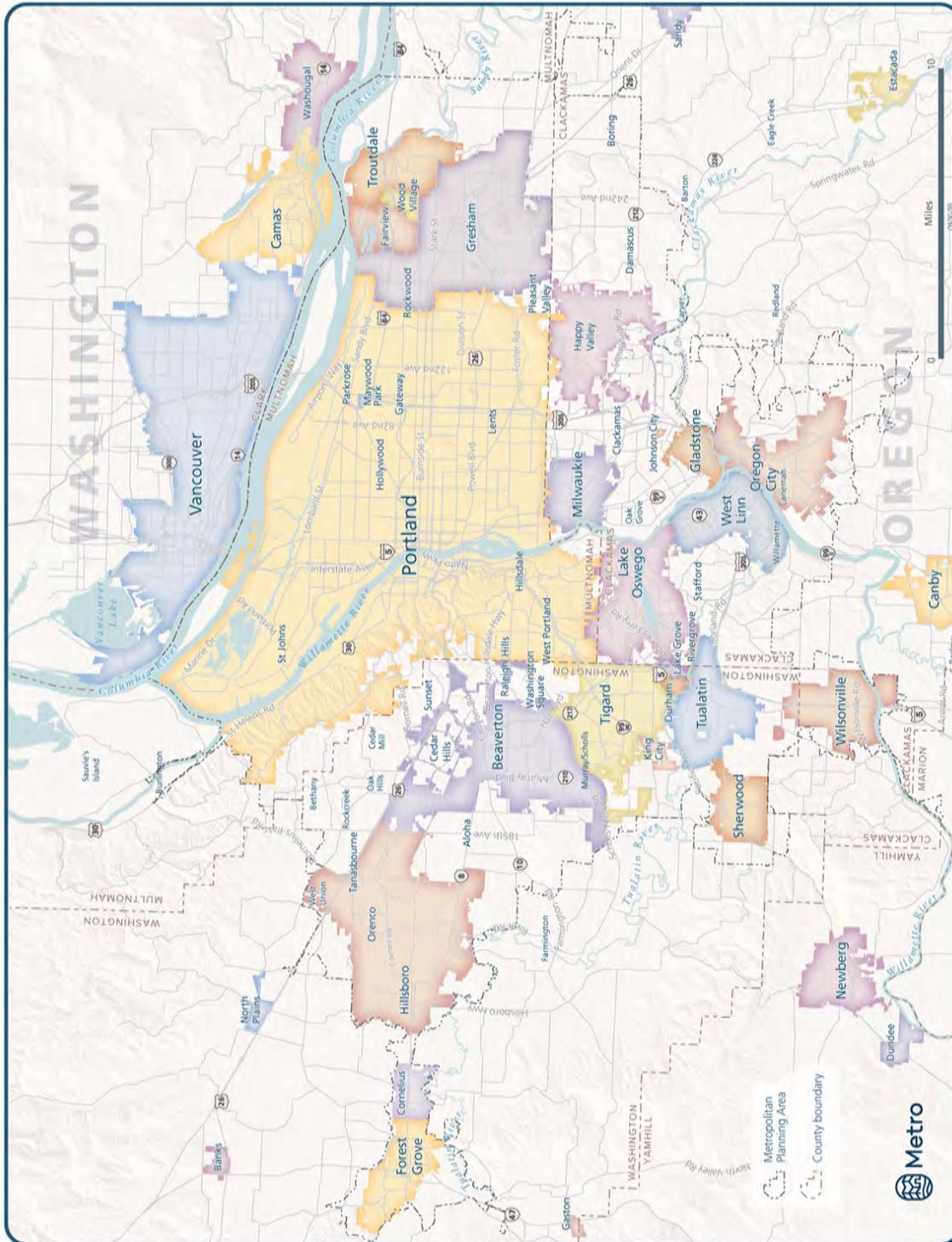
The Portland region is situated at the northern end of the Willamette Valley, a fertile river valley surrounded by dramatic natural features - the Coast Range to the west, the Cascade Range to the east, and the Columbia River to the north (including the Columbia River Gorge National Scenic area). Several snow-capped mountains are visible from different vantage points in the region – including Mt. Hood, Mt. St. Helens, Mt. Rainier and Mt. Adams. Within the region, rivers, streams, wetlands, buttes, forest lands, meadows and rolling to steep hillsides dominate the natural landscape. Outside the urban growth boundary, agricultural lands and other natural landscape features influence the sense of place for the greater region.

Although not the largest gateway on the U.S. West Coast, the Portland-Vancouver metropolitan region is one of four international gateways on the West Coast, including the Puget Sound, the San Francisco Bay area and Southern California. In this role, the region serves as a gateway to domestic and international markets for businesses located throughout the state of Oregon, Southwest Washington, the Mountain states and the Midwest. Clackamas, Multnomah and Washington counties also play a significant role in the state’s agricultural production, representing nearly 17 percent of the state’s total value of production and 60 percent of the Port of Portland’s export tonnage.¹ The economy of our region and state depend on our ability to support the transportation needs of these industries and provide reliable access to gateway facilities.

The Oregon portion of the Portland-Vancouver metropolitan region encompasses 24 cities and 3 counties as shown in **Figure 1.2**. Metro’s urban growth boundary and jurisdictional boundaries are shown in **Figure 1.3**.

¹ *Identification and Assessment of the Long-Term Commercial Viability of Metro Region Agricultural Lands*, Oregon Department of Agriculture, January 2007, Pg. 4.

Figure 1.2 Cities and counties of the Portland-Vancouver metropolitan region



1.3 METROPOLITAN TRANSPORTATION PLANNING PROCESS

Metro’s transportation planning activities are guided by a federally mandated decision-making framework called the metropolitan transportation planning process. This planning process requires all urban areas with populations over 50,000 to have a designated Metropolitan Planning Organization (MPO) to coordinate transportation and air quality planning and programming of federal transportation dollars within their boundaries.

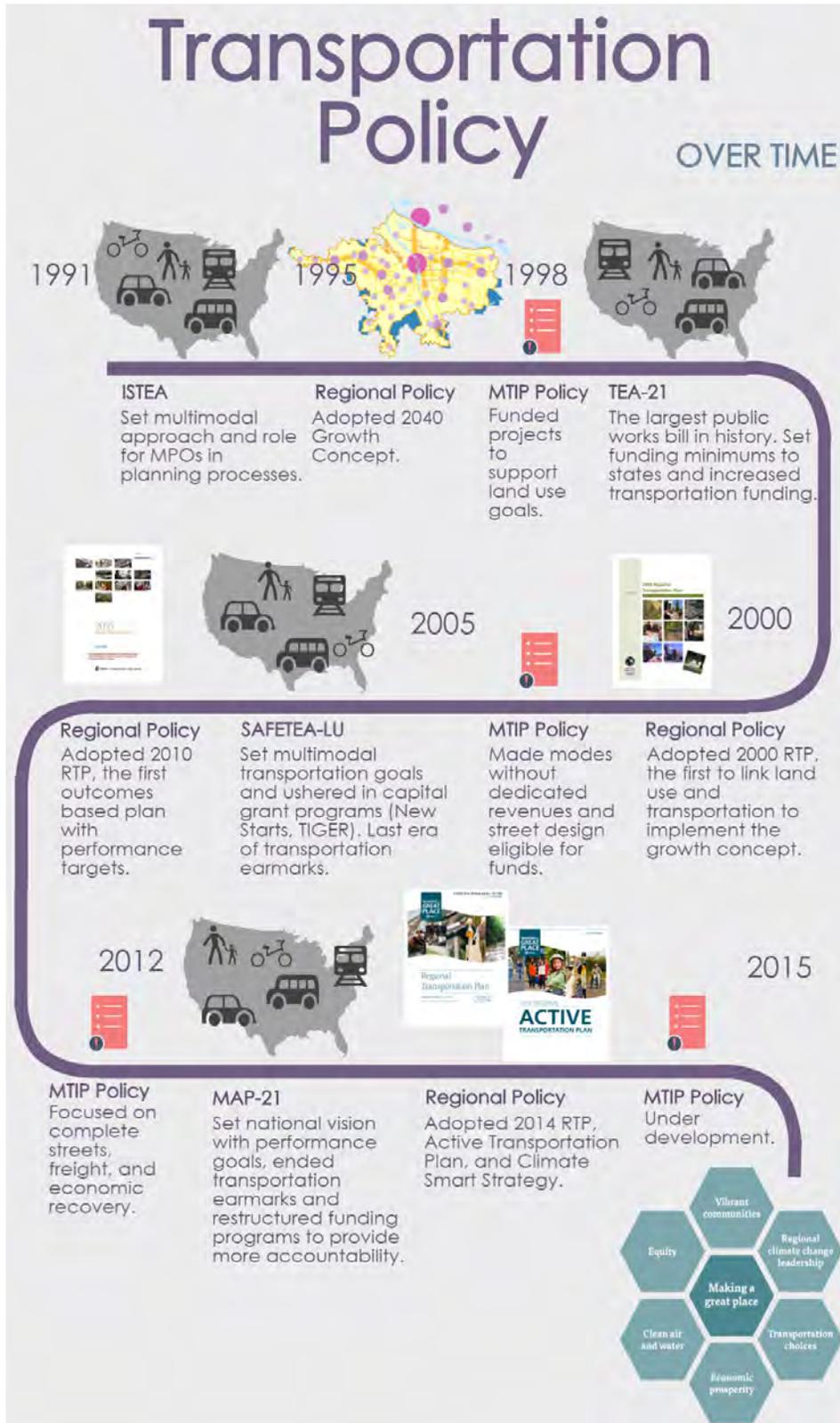
Metro is the designated MPO for the Portland tri-county area. As such, Metro is responsible for coordinating development of the RTP in cooperation with the region’s transportation providers—the 24 cities and three counties in the Metro boundary, the Oregon Department of Transportation, Oregon Department of Environmental Quality, Port of Portland, TriMet, South Metro Area Rapid Transit (SMART), Southwest Washington Regional Transportation Council (RTC), Washington Department of Transportation and other Clark County governments. The process also includes opportunities for open, timely and meaningful involvement of the public, and requires comprehensive consideration of the link between transportation and other regional goals for land use, the economy and the environment, including public health, safety, mobility, accessibility and equity. A summary of RTP public engagement efforts as well as a log of comments and staff responses will be provided in Appendix D.

The Metro Council adopted the first RTP in 1983. As a cornerstone of the metropolitan transportation planning process, the RTP provides a long-range blueprint for transportation in the Portland metropolitan region with a 20-year minimum time horizon. The RTP is updated every five years to reflect changing conditions in the region and respond to new federal and state regulatory developments.

State law establishes requirements for consistency of plans at the state, regional and local levels. The RTP serves as the region’s regional transportation system plan (TSP), consistent with Oregon Transportation Planning Rule (TPR) requirements. The RTP must be consistent with the Oregon Transportation Plan, state modal and facility plans that implement the Oregon Transportation Plan, and the Oregon Transportation Planning Rule. Local plans must be consistent with the RTP. Projects and programs must be in the RTP’s Financially Constrained System in order to be eligible for federal and state funding.

Figure 1.3 illustrates how federal and regional transportation policies have evolved since the 1990s.

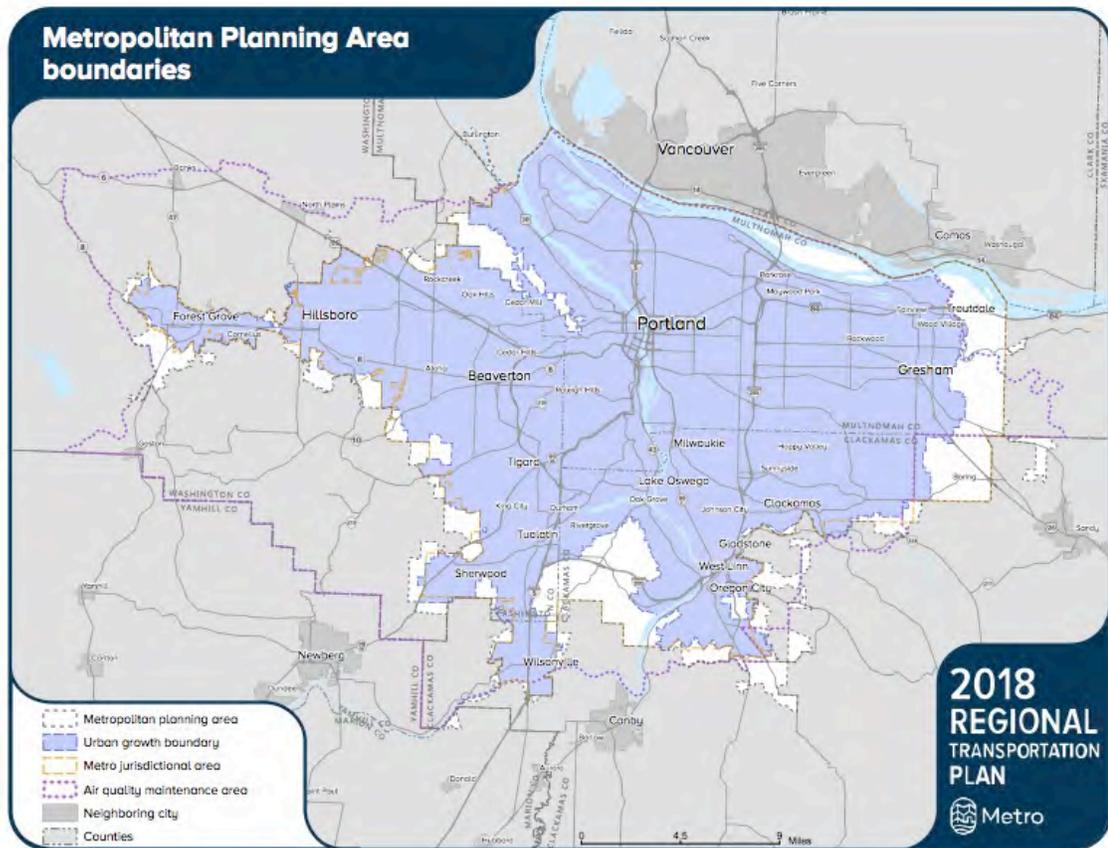
Figure 1.3 How federal and regional transportation policies have evolved since the early 1990s



The region has several planning boundaries with different purposes

Federal and state law requires several metropolitan transportation planning boundaries be defined and planned for in the region for different purposes. These boundaries are shown in **Figure 1.4**.

Figure 1.4 Metropolitan Planning Area boundary



First, Metro’s jurisdictional boundary encompasses the urban portions of Multnomah, Washington and Clackamas counties. Second, under Oregon law, each city or metropolitan area in the state has an urban growth boundary that separates urban land from rural land. Metro is responsible for managing the greater Portland region's urban growth boundary.

Third, the Urbanized Area Boundary (UAB) is defined to delineate areas that are urban in nature distinct from those that are largely rural in nature. The Portland-Vancouver metropolitan region is somewhat unique in that it is a single urbanized area that is located in two states and served by two MPOs. The federal UAB for the Oregon-portion of the Portland-Vancouver metropolitan region is distinct from the Metro urban growth boundary (UGB).

Fourth, MPO’s are required to establish a Metropolitan Planning Area (MPA) Boundary, which marks the geographic area to be covered by MPO transportation planning activities.

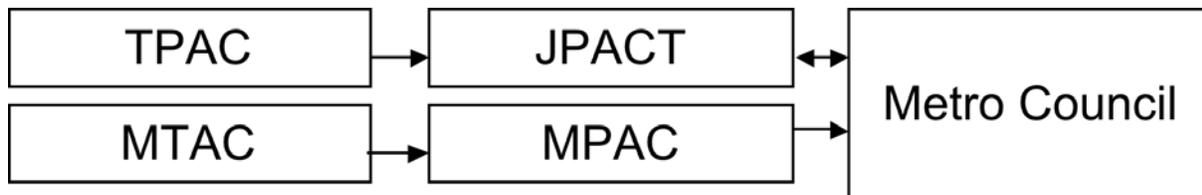
At a minimum, the MPA boundary must include the urbanized area, areas expected to be urbanized within the next twenty years and areas within the Air Quality Maintenance Area Boundary (AQMA) – a fifth boundary.

The federally-designated AQMA boundary is the area subject to State Implementation Plan (SIP) regulations. The Portland region’s AQMA boundary was developed as part of the ozone and carbon monoxide SIPs, which are pollutants the region had previously violated national air quality standards. The region reached a recent milestone that means that transportation conformity no longer is required to be performed in this region. The region continues to comply with other obligations and requirements outlined in the SIPs.

Metro facilitates the metropolitan transportation planning process through Metro’s advisory committees

Metro facilitates the metropolitan transportation planning process through four advisory committee bodies –the Joint Policy Advisory Committee on Transportation (JPACT), the Metro Policy Advisory Committee (MPAC), the Transportation Policy Alternatives Committee (TPAC) and the Metro Technical Advisory Committee (MTAC). In addition, the Metro Committee for Citizen Involvement (MCCI) advises the Metro Council on ways to engage residents in regional planning activities. **Figure 1.5** displays the regional transportation decision-making process.

Figure 1.5 Regional Transportation Decision-Making Process



Source: Metro

All transportation-related actions (including federal MPO actions) are recommended by JPACT to the Metro Council. The Metro Council can approve the recommendations or refer them back to JPACT with a specific concern for reconsideration. Final approval of each item, therefore, requires the concurrence of both bodies. Under state law, the RTP serves as the region’s transportation system plan (TSP). As a result, the Metro Policy Advisory Committee (MPAC) also has a role in approving the regional transportation plan as a land use action, consistent with statewide planning goals and the Metro Charter.

In addition, the Bi-State Coordination Committee advises the RTC, and JPACT/Metro on issues of bi-state significance. On issues of bi-state land use and economic significance, the Committee advises the local and regional governments appropriate to the issue. Since formation in 1999, the committee has reviewed Federal transportation funding reauthorization, Columbia River Channel deepening and projects and studies focused on the I-5 Corridor.

Restructuring in 2004, expanded this role to include examining the connection between land use and transportation in the I-5 corridor and taking a multi-modal approach – including freight and transit – in considering the impacts of land use and transportation decisions within the context of economic development and environmental justice issues. JPACT and the RTC Board cannot take action on an issue of major bi-state transportation significance without first referring the issue to the Bi-State Coordination Committee for their consideration and recommendation.

1.4 THE 2018 REGIONAL TRANSPORTATION PLAN: THE PROCESS FOR GETTING TO HERE

The 2018 RTP update was completed in five phases. From May 2015 to Fall 2018, the Metro Council and staff engaged the public, community and business leaders and local, regional and state partners to update the Regional Transportation Plan. Engagement and planning activities were organized to address the regional challenges that come with a growing region with a focus on implementing the 2014 Climate Smart Strategy and these policy priorities:



Transit



Transportation equity



Finance



Freight



Transportation design



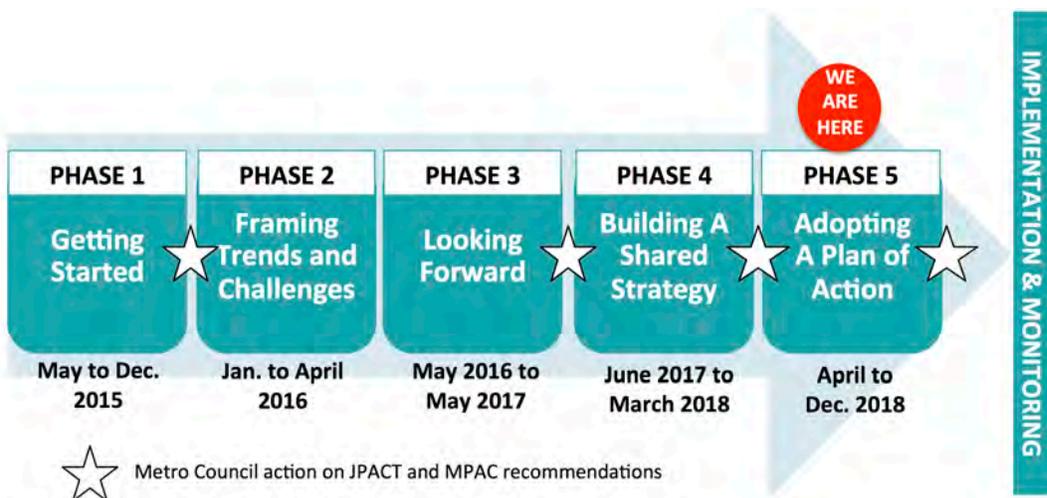
Transportation safety



Performance



Emerging Technology



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 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.



Creating a new dialogue to shape the future we want

From start to finish, the 2018 RTP update was about meaningful engagement with the community, business interests and our elected officials working together to craft a shared vision and investment strategy for our transportation system.



The engagement activities produced more than 18,000 touch points with regional partners, community and business leaders and residents of the region to inform development of the draft 2018 Regional Transportation Plan.

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 the Oregon Department of Transportation's (ODOT) 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.



Regional leadership forums

To address the challenges and trends facing our region, the Metro Council convened a series of four regional leadership forums to shape development of the 2018 Regional Transportation Plan.

Forum participants included members of MPAC, JPACT, state legislators, and community and business leaders from throughout the greater Portland region. Working side-by-side, local, regional and state leaders brought the perspectives of their communities and constituents to the conversation around the challenges we are facing, our vision for the future and potential solutions for moving forward together. The discussions shaped the update to the plan's vision, goals, policies and projects.

1 Exploring Big Ideas for Our Transportation Future 4/22/16

2 Building the Future We Want 9/23/16

3 Connecting Our Priorities to Our Vision 12/2/16

4 Finalizing Our Shared Plan for the Region 3/2/18

Metro Council also hosted its 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 release of a second Regional Snapshot on transportation and the 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 ODOT, Metro, South Metro Area Regional Transit (SMART) and TriMet. All project submissions were required to have 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 was 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 in 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 is 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 Aug. 13. For this comment period, engagement activities include:

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

The Metro Council will hold a hearing on Aug. 2, 2018. All comments received during the comment period will be summarized in a public comment report. Recommend changes to the draft materials to respond to all substantive comments received during the comment period will be summarized in a public comment log that will be considered by MPAC, JPACT and the Metro Council during the adoption process.

JPACT and MPAC will make recommendations to the Metro Council in October 2018. Metro Council is scheduled to hold legislative hearings on Nov. 8 and Dec. 6. Metro Council will consider adoption of the final plan, project priorities and strategies for safety, transit, freight and emerging technology in December 2018.

1.5 WHAT'S NEXT MOVING FORWARD?

The greater Portland region pioneered approaches to land use and transportation planning in the past, and is uniquely positioned to address these trends – mainly because the region has solid, well-integrated transportation and land-use systems in place and a history of working together to address complex challenges at a regional scale.

In the 1990s, regional policy discussions centered on how and where the region should grow to protect the things that make this region a great place to live, work and play. Those discussions led to the adoption of the region's long-range plan, the 2040 Growth Concept. This plan reflects shared community values and desired outcomes that continue to resonate today. Today it is time to revisit how we are implementing our vision, make some corrections and find new strategies and resources to create the future we want for our region. The rest of this plan represents a new step forward to respond to the changes and challenges we face and set a new course for future transportation decisions and implementation of the 2040 Growth Concept and Climate Smart Strategy.

The pages ahead provide an updated blueprint and investment strategy for a more sustainable transportation system that links land use and transportation, protects the environment and supports the region's economy. Translating our vision into a reality will not be a simple task – and it will take time. More work is needed, as this plan does not achieve all the goals we've defined. It represents a new step forward for our region.



This RTP provides an updated blueprint and investment strategy for building a more equitable and sustainable transportation system that connects people where they want to travel, protects the environment and supports the region's economy. The updated plan will take sustained, focused work from every partner in the region.

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2018 Regional Transportation Plan



safe • reliable • healthy • affordable

PUBLIC REVIEW DRAFT

2018 Regional Transportation Plan

Chapter 2

Our Shared Vision for Transportation

June 29, 2018

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2.0 INTRODUCTION

The 2018 Regional Transportation Plan defines a shared vision for the greater Portland region's transportation system that reflects the values and desired outcomes expressed by the public, policymakers and community and business leaders engaged in development of the plan.

Transportation shapes our communities and our daily lives, allowing us to reach our jobs and recreational opportunities, access goods and services, and meet daily needs. This chapter presents a shared, long-term vision and supporting goals, objectives and performance targets that will guide planning and building the transportation system serving the Portland metropolitan region through 2040. The vision reflects the continued evolution of transportation planning from a project-driven endeavor to one that is framed by a broader set of outcomes that affect people's everyday lives.



Learn more about the 2018 Regional Transportation Plan at oregonmetro.gov/rtp

Rapid growth and change across our region have exposed and exacerbated longstanding economic and racial inequities, threatening to undermine the broader benefits of economic growth as well as our region's quality of life. The vision and supporting goals, objectives and performance targets in this chapter aim to better integrate transportation and land use efforts to protect the region's economic prosperity, environmental quality, and quality of life and improve the lives of the people who call this region home.

To achieve our vision for the future, we must work together to address inequities as we build vibrant, walkable communities with affordable homes, provide safe, reliable, healthy and affordable transportation choices, address growing congestion, reduce greenhouse gas emissions, and protect critical natural areas and the irreplaceable farm and forest lands that surround the region.

Achievement of the plan's vision and goals will occur through partnerships, ongoing engagement and a variety of policies, strategies and actions at the local, regional, state and federal levels. The vision laid out in these pages, will take sustained, focused work from every partner in the region. The various jurisdictions in the region are expected to pursue policies, strategies and projects that contribute to achieving the regional vision and goals of the RTP to ensure an equitable, prosperous and sustainable future.

Chapter organization

This chapter is organized into the following sections:

- 2.1 Outcomes-based framework to guide transportation planning and decision-making:** The section describes the outcomes-oriented performance-based planning approach the RTP uses to link transportation to a broader set of desired outcomes for vibrant communities, a healthy economy, equity and the environment. This approach also responds to more recent federal and state performance-based planning requirements.
- 2.2 2040 Growth Concept – Integrated land use and transportation vision and strategy:** This section describes the 2040 Growth Concept vision and establishes the primary mission of the plan as a key tool for implementing the 2040 Growth Concept and supporting local aspirations for growth.
- 2.3 Shared vision for the regional transportation system:** This section describes how the RTP will serve a key role in implementing the 2040 Growth Concept and supporting local aspirations for growth.
- 2.4 Goals, objectives and performance targets:** This section lays out eleven goals and supporting objectives and performance targets for a 21st century regional transportation system. The goals, objectives and targets establish policy and investment priorities that will guide future planning, investment decisions and monitoring.



In 2040, everyone in the Portland metropolitan region will share in a prosperous, equitable economy and exceptional quality of life sustained by a safe, reliable, healthy, and affordable transportation system with travel options.

Vision approved by the Metro Policy Advisory Committee, Joint Policy Advisory Committee on Transportation and the Metro Council in May 2017.

2.1 OUTCOMES-BASED FRAMEWORK TO GUIDE TRANSPORTATION PLANNING AND DECISION- MAKING

We know the transportation funding landscape is changing, and building a world-class transportation system requires steady, long-term investment. But we don't have the resources to invest at the levels needed to address all of the challenges the region faces and achieve our shared vision and goals for the transportation system.

Planning creates opportunities for individuals and communities to define and articulate their collective desires and aspirations for enhancing the quality of life in our region and their communities. It allows the people and their elected leaders to take stock of the successes that have been achieved in their communities through years of hard work. It also requires us to think carefully about and be accountable for our future choices, ensuring we get the greatest possible return on public investments. Planning also allows us to identify where investments are most needed in order to deliver the vision a plan articulates.

As a major tool for ensuring stewardship of our public investments, the RTP identifies needed next steps to achieve each of the six desired outcomes for the greater Portland region, and helps us understand whether we are on the right track.

This 2018 RTP continues to broaden the way that outcomes are used to measure success and define transportation system needs. This plan expands the outcomes-based policy framework adopted in 2010, to include new goals and objectives for transportation equity, safety, reliability and accessibility that were used



Six desired outcomes for the greater Portland region

Equity

The benefits and burdens of growth and change are distributed equitably.

Vibrant communities

People live, work and play in vibrant communities where their everyday needs are easily accessible.

Economic prosperity

Current and future residents benefit from the region's sustained economic competitiveness and prosperity.

Safe and reliable transportation

People have safe and reliable transportation choices that enhance their quality of life.

Clean air and water

Current and future generations enjoy clean air, clean water and healthy ecosystems.

Climate leadership

The region is a leader in minimizing contributions to global warming.

to evaluate performance of the investments recommended in this plan. These updated goals and objectives (and related performance measures) will also be used to monitor how the transportation system is performing in between scheduled plan updates.

The plan identifies the responsibility that the Portland region's 24 cities and 3 counties, and multiple state and regional agencies, have to the people of the region, to our environment and to the region's economic prosperity now and for future generations.

1. People - Responsibility of the plan to the people of the region.

The plan envisions an interconnected and multimodal transportation system that provides safe, reliable, healthy and affordable travel choices for everyone to get to work, education, community places and nature. Implementation of the plan must ensure that historically marginalized communities, who experience disparities in access, safety, affordability, and other outcomes by the existing system, are equitably served by the interconnected and multimodal transportation system to address these disparate outcomes. In order to ensure that the Plan's multimodal system serves the people of the region, everyone must have meaningful opportunities to participate in development and implementation of the plan, but particularly those communities who have historically been left of decision-making processes to influence the shape of the system.



People



Planet



Prosperity

The plan has a responsibility to the people of the region, to our planet and to the region's economic prosperity now and for future generations.

2. Planet - Responsibility of the plan to our environment.

Implementation of the plan should ensure that the multimodal transportation system protects and enhances the region's air and water, critical natural areas and environmental resources and rich cultural legacy.

3. Prosperity - Responsibility of the plan to the economic prosperity of the region.

Implementation of the plan should provide a multimodal transportation system that supports a strong and healthy economy and helps the region's businesses and industries remain competitive by providing affordable access to jobs and enabling the exchange of goods and services. Moving forward, the region must sharpen its efforts to quantify, assess and

consider economic return on public investments in transportation infrastructure, in order to spend limited public funds wisely to sustain the region’s economic prosperity, and that prosperity is shared across the region.

These responsibilities and the region’s six desired outcomes are prominently interwoven into the RTP goals and objectives, and the policies that support those goals and form the policy foundation for the rest of the plan to ensure transportation decisions support this larger set of responsibilities and the six desired outcomes. The plan calls for making transportation investment decisions based on achieving the multiple outcomes to preserve and enhance the quality of life, our economy and the environment now and for future generations.

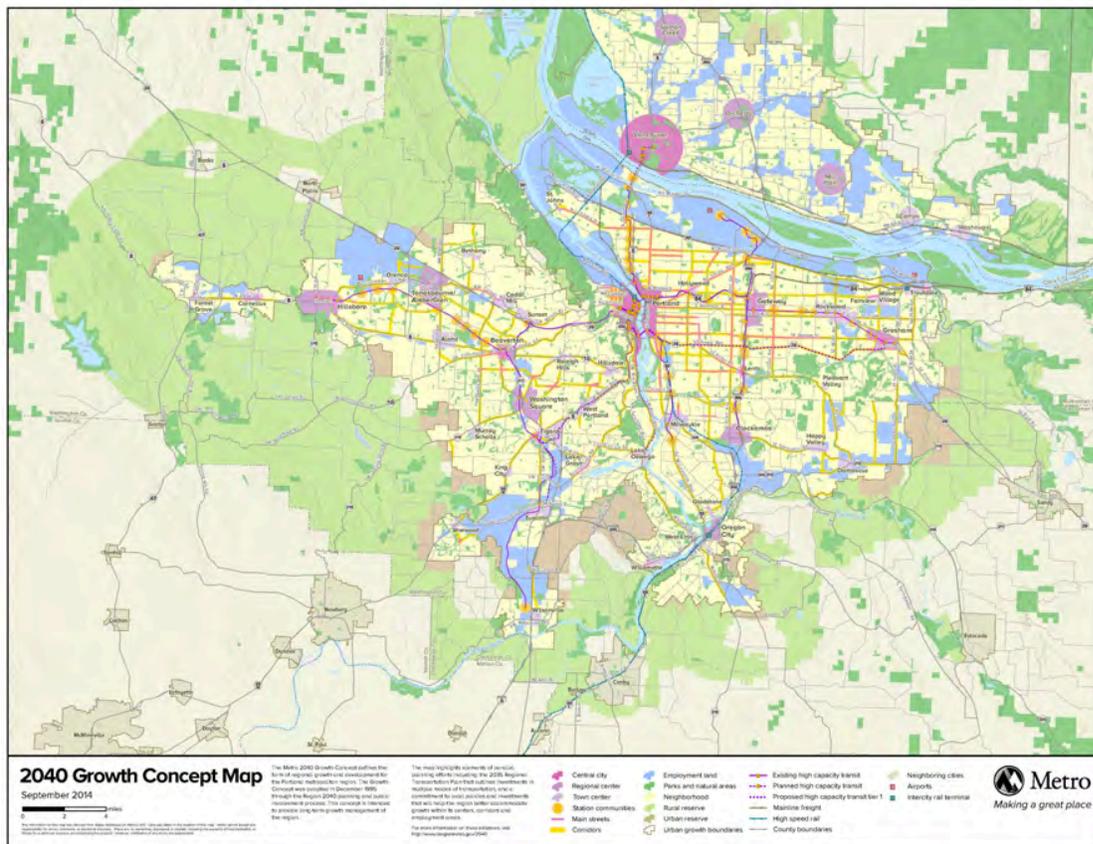


2.2 2040 GROWTH CONCEPT – INTEGRATED LAND USE AND TRANSPORTATION VISION AND STRATEGY

The 2018 Regional Transportation Plan is a key tool for implementing the 2040 Growth Concept.

In 1995, the greater Portland region adopted the 2040 Growth Concept, the long-range strategy for managing growth that integrates land use and transportation system planning to preserve the region’s economic health and livability in an equitable, environmentally sound and fiscally-responsible manner.

Figure 2.1 2040 Growth Concept – an integrated land use and transportation vision



Shown in **Figure 2.1**, the 2040 Growth Concept includes land use and transportation building blocks that express the region’s aspiration to incorporate population growth within existing urban areas as much as possible and expand the urban growth boundary only when necessary. It concentrates mixed-use and higher density development in urban centers, station communities, corridors and main streets that are well-served by transit. It envisions a well-connected street network that supports biking and walking for short trips. Employment lands serve as hubs for regional commerce and include industrial land

and freight facilities for truck, marine, air and rail cargo sites that enable goods to be generated and moved in and out of the greater Portland region. Freight access to industrial and employment lands is centered on rail, the freeway system and other road connections.

The 2040 Growth Concept expresses the region’s aspiration to incorporate population growth within existing urban areas as much as possible and expand the urban growth boundary only when necessary. Implicit in the 2040 Growth Concept is the understanding that compact development is more affordable, sustainable, livable and fiscally responsible than urban sprawl, and will help reduce the region’s carbon footprint. Increased pedestrian and bicycle access and new transit and road capacity are needed to achieve the 2040 Growth Concept vision and support the region’s economic vitality.

Transportation and the economy are closely linked and investments that serve certain land uses or transportation facilities may have a greater economic return than others. Focusing transportation investments and other strategies to support the gateway function of our transportation system is the primary way to strengthen that gateway role for the region and the rest of the state. This means ensuring reliable and efficient connections between intermodal facilities and destinations within and outside the region to promote the region's function as a gateway for trade and tourism.

2040 Growth Concept Land-use Design Types

The 2040 Growth Concept land uses, called 2040 Design Types, are arranged in a hierarchy. RTP investments are focused in the primary and secondary land uses, referred to as 2040 Target Areas. These are the areas expected to absorb a large share of the region’s future growth. The hierarchy also serves as a framework for prioritizing RTP investments. **Table 2.1** lists the 2040 design types based on this hierarchy.

Table 2.1 2040 Growth Concept land-use design types

2040 Target Areas		
Primary land uses	Secondary land uses	Other urban land uses
<ul style="list-style-type: none"> Portland central city Regional centers Industrial areas Freight and passenger intermodal facilities 	<ul style="list-style-type: none"> Employment areas Town centers Station communities Corridors Main streets 	<ul style="list-style-type: none"> Neighborhoods

Different parts of the region are at different stages of implementing the 2040 Growth Concept. As a result, different areas may have different transportation investment needs and priorities that will require substantial public and private investment over the long-

term. **Table 2.2** summarizes infrastructure investment strategies for each stage of implementation.

Table 2.2 Priority infrastructure investment strategies

	Developed Areas	Developing Areas	Undeveloped Areas
Stage of Development	<p>Built-out areas with most new housing and jobs accommodated through infill, redevelopment and brownfields development.</p>	<p>Redeveloping and developing areas, with most new housing and jobs being accommodated through infill, redevelopment and greenfield development.</p>	<p>More recent additions to the urban growth boundary, with most new housing and jobs accommodated through greenfield development.</p>
Infrastructure Investment Strategies	<p>Operations, maintenance and preservation of existing transportation assets.</p> <p>Managing the existing transportation system to optimize performance for all modes of travel.</p> <p>Leveraging infill, redevelopment and use of brownfields.</p> <p>Addressing bottlenecks and improving system connectivity to address barriers and safety deficiencies.</p> <p>Providing a multimodal urban transportation system.</p> <p>Completing local street connections needed to complement the arterial street network.</p>	<p>Operations, maintenance and preservation of existing transportation assets.</p> <p>Preserving right-of-way for future transportation system.</p> <p>Managing the existing transportation system to optimize performance for all modes of travel.</p> <p>Leveraging infill, redevelopment and use of brownfields</p> <p>Providing a multimodal urban transportation system.</p> <p>Focusing on bottlenecks and improving system connectivity to address barriers and safety deficiencies.</p> <p>Completing local street connections needed to complement the arterial network.</p>	<p>Operations, maintenance and preservation of existing transportation assets.</p> <p>Preserving right-of-way for future transportation system.</p> <p>Providing a multimodal urban transportation system.</p> <p>Managing new transportation system investments to optimize performance for all modes of travel.</p> <p>Focusing on bottlenecks and improving system connectivity to address barriers and safety deficiencies.</p> <p>Completing local street connections needed to complement the arterial street network.</p>

2.3 SHARED VISION FOR THE REGIONAL TRANSPORTATION SYSTEM

Transportation planning and investment decisions and the region's desired land use, social, economic and environmental outcomes are so interconnected that success of the 2040 Growth Concept hinges significantly on achieving the plan's goals and objectives.

The RTP vision statement below presents an aspirational view of the future of the region's transportation system to reflect the values and desired outcomes expressed by the public, policymakers and community and business leaders engaged in development of the Regional Transportation Plan.

In 2040, everyone in the Portland metropolitan region will share in a prosperous, equitable economy and exceptional quality of life sustained by a safe, reliable, healthy, and affordable transportation system with travel options.

Approved by the Metro Policy Advisory Committee, Joint Policy Advisory Committee on Transportation, and the Metro Council in May 2017.

This shared vision for the future provides a benchmark for building a transportation system that serves all people and businesses in the greater Portland region. This vision and supporting goals and objectives will serve as a foundation for identifying investment priorities and policies and measuring progress toward building a transportation system that delivers the outcomes we want.

Outcomes-based goals to realize our vision

To realize our vision for a transportation system that serves all people and businesses, we need goals to keep us focused and moving forward. The Regional Transportation Plan goals were first adopted in 2010 after significant engagement with communities, residents, businesses and stakeholders throughout the region. In 2014, the Metro Council and JPACT approved the addition of a goal to demonstrate climate leadership and reduce greenhouse gas emissions.

The outcomes-based RTP goals guide the region's transportation planning and decision-making and include specific objectives and performance targets to help measure the progress we are making toward our vision for our transportation future.

The goals, objectives and performance targets are presented in the following section.

2.4 GOALS, OBJECTIVES AND PERFORMANCE TARGETS

While the vision and goals are vital components of the plan, equally important are measurable objectives and quantifiable performance targets to track the region’s progress. Investments that achieve objectives and performance targets are critical for the region to be successful in realizing a truly integrated, multimodal transportation system that achieves the goals of the RTP.

Continuing the practice established with the RTP adopted in 2010, this plan includes transportation performance targets that support the outcomes-based framework reflected in the plan’s goals and objectives. The goals, objectives and performance targets provided policy direction for developing the investment strategy recommended in Chapter 6. Chapter 7 includes findings on how well the RTP performs relative to the targets.

The performance targets are numerical benchmarks to assess the region’s progress in carrying out the RTP vision. These targets draw from federal and state legislation and regional policies. They are aspirational and support the region’s performance-based planning and decision-making framework shown in Figure 2.2.

Figure 2.2 RTP Performance-Planning and Decision-making Framework



Each goal area that follows is arranged similarly:

- Statement of the goal.
- Objectives for implementing the goal.
- Performance measures (and targets in some cases) to measure and track progress toward the goal

Policies to implement the vision and goals are in Chapter 3.

GOAL 1: Vibrant Communities

The greater Portland region is a great and affordable place to live, work and play where people can easily and safely reach jobs, schools, shopping, services, and recreational opportunities from their home by walking, biking, transit, shared trip or driving.



- **Objective 1.1 2040 Growth Concept Implementation** – Focus growth and transportation investment in designated 2040 growth areas (the Portland central city, regional and town centers, corridors, main streets, and employment and industrial areas).
- **Objective 1.2 Walkable Communities** – Increase the share of households in walkable, mixed-use areas served by current and planned frequent transit service.
- **Objective 1.3 Affordable Location-Efficient Housing Choices** – Increase the number and diversity of regulated affordable housing units within walking distance of current and planned frequent transit service.
- **Objective 1.4 Access to Community Places¹** – Increase the number and variety of community places that households, especially households in historically marginalized communities, can reach within a reasonable travel time for all modes of travel.

Note: Relevant RTP performance measures and targets from Chapter 7 will be added as the RTP is finalized.

¹ Community places are defined as key local destinations such as schools, libraries, grocery stores, pharmacies, hospitals and other medical facilities, general stores, parks, greenspaces, and other places that provide key services and/ or daily needs.

GOAL 2: Shared Prosperity

People have access to jobs, goods and services and businesses have access to workers, goods and markets in a diverse, inclusive, innovative, sustainable and strong economy that equitably benefits all the people and businesses of the greater Portland region.



- **Objective 2.1 Connected Region** – Build an integrated system of throughways, arterial streets, freight routes and intermodal facilities, transit services and bicycle and pedestrian facilities, with efficient connections between modes that provide access to jobs, markets and community places within and beyond the region.
- **Objective 2.2 Access to Industry and Freight Intermodal Facilities** – Increase access to industry and freight intermodal facilities by a reliable and seamless freight transportation system that includes air cargo, pipeline, trucking, rail, and marine services to facilitate efficient and competitive shipping choices for goods movement in, to and from the region.
- **Objective 2.3 Access to Jobs and Talent** – Attract new businesses and family-wage jobs and retain those that are already located in the region while increasing the number and variety of jobs that households can reach within a reasonable travel time.
- **Objective 2.4 Transportation and Housing Affordability** – Reduce the share of income that households in the region spend on transportation to lower overall household spending on transportation and housing.

Note: Relevant RTP performance measures and targets from Chapter 7 will be added as the RTP is finalized.

GOAL 3: Transportation Choices

People throughout the region have safe, convenient, healthy and affordable options that connect them to jobs, school, services, and community places, support active living and reduce transportation-related pollution.



- **Objective 3.1 Travel Choices** – Plan communities and design and manage the transportation system to increase the proportion of trips made by walking, bicycling, shared rides and use of transit.
- **Objective 3.2 Active Transportation System Completion** – Complete all gaps in regional bicycle and pedestrian networks.
- **Objective 3.3 Access to Transit** – Increase household and job access to current and planned frequent transit service.
- **Objective 3.4 Access to Active Travel Options** – Increase household and job access to planned regional bike and walk networks.

Note: Relevant RTP performance measures and targets from Chapter 7 will be added as the RTP is finalized.

GOAL 4: Reliability and Efficiency

The transportation system is managed and optimized to ease congestion, and people and businesses are able to safely, reliably and efficiently reach their destinations by a variety of travel options.



- **Objective 4.1 Regional Mobility** – Maintain reasonable person-trip and freight mobility and reliable travel times for all modes in the region’s mobility corridors, consistent with the designated modal functions of each facility and planned transit service within the corridor.
- **Objective 4.2 Travel Management** – Increase the use of real-time data and decision-making systems to actively manage transit, freight, arterial and throughway corridors.
- **Objective 4.3 Travel Information** – Increase the number of travelers, households and businesses with access to real-time comprehensive, integrated, and universally accessible travel information.
- **Objective 4.4 Incident Management** – Reduce incident clearance times on the region’s transit, arterial and throughway networks through improved traffic incident detection and response.
- **Objective 4.5 Demand Management** – Increase the number of households and businesses with access to outreach, education, incentives and other tools that increase shared trips and use of travel options.
- **Objective 4.6 Pricing** – Expand the use of pricing strategies to manage vehicle congestion and encourage shared trips and use of transit.
- **Objective 4.7 Parking Management** – Manage the supply and price of parking in order to increase shared trips and use of travel options and to support efficient use of urban land.

Note: Relevant RTP performance measures and targets from Chapter 7 will be added as the RTP is finalized.

GOAL 5: Safety and Security

People's lives are saved, crashes are avoided and people and goods are safe and secure when traveling in the region.



- **Objective 5.1 Transportation Safety** – Eliminate fatal and severe injury crashes for all modes of travel.
- **Objective 5.2 Transportation Security** – Reduce the vulnerability of the public and critical passenger and freight transportation infrastructure to crime and terrorism.
- **Objective 5.3 Preparedness and Resiliency** – Reduce the vulnerability of regional transportation infrastructure to natural disasters, climate change and hazardous incidents.

Note: Relevant RTP performance measures and targets from Chapter 7 will be added as the RTP is finalized.

GOAL 6: Healthy Environment

The greater Portland region's biological, water, historic and cultural resources are protected and preserved.



- **Objective 6.1 Biological and Water Resources** – Protect fish and wildlife habitat and water resources from the negative impacts of transportation.
- **Objective 6.2 Historic and Cultural Resources** – Protect historic and cultural resources from the negative impacts of transportation.

Note: Relevant RTP performance measures and targets from Chapter 7 will be added as the RTP is finalized.

GOAL 7: Healthy People

People enjoy safe, comfortable and convenient travel options that support active living and increased physical activity, and transportation-related pollution that negatively impacts public health are minimized.



- **Objective 7.1 Active Living** – Improve public health by providing safe, comfortable and convenient transportation options that support active living and physical activity to meet daily needs and access services.
- **Objective 7.2 Pollution Impacts** – Minimize noise and other transportation-related pollution health impacts.
- **Objective 7.3 Clean Air** – Reduce transportation-related air pollutants, including and air toxics emissions.

Note: Relevant RTP performance measures and targets from Chapter 7 will be added as the RTP is finalized.

Goal 8: Climate Leadership

The health and prosperity of people living in the greater Portland region are improved and the impacts of climate change are minimized as a result of reducing transportation-related greenhouse gas emissions.



- **Objective 8.1 Climate Smart Strategy Implementation** – Implement policies, investments and actions identified in the adopted Climate Smart Strategy, including coordinating land use and transportation; making transit convenient, frequent, accessible and affordable; making biking and walking safe and convenient; and managing parking and travel demand.
- **Objective 8.2 Greenhouse Gas Emissions Reduction** – Meet adopted targets for reducing transportation-related greenhouse gas emissions.
- **Objective 8.3 Vehicle Miles Traveled** – Reduce vehicle miles traveled per capita.
- **Objective 8.4 Low and No Emissions Vehicles** – Support state efforts to transition Oregon to cleaner, low carbon fuels and increase the use of more fuel-efficient vehicles, including electric and alternative fuel vehicles.
- **Objective 8.5 Energy Conservation** - Reduce transportation-related consumption of energy and reliance on sources of energy derived from petroleum and gasoline.

Note: Relevant RTP performance measures and targets from Chapter 7 will be added as the RTP is finalized.

GOAL 9: Equitable Transportation

The transportation-related disparities and barriers experienced by historically marginalized communities, particularly communities of color, are eliminated.



- **Objective 9.1 Transportation Equity** – Eliminate disparities related to access, safety, affordability and health outcomes experienced by people of color and other historically marginalized communities.
- **Objective 9.2 Barrier Free Transportation** – Eliminate barriers that people of color, low income people, youth, older adults, people with disabilities and other historically marginalized communities face to meeting their travel needs.

Note: Relevant RTP performance measures and targets from Chapter 7 will be added as the RTP is finalized.

GOAL 10: Fiscal Stewardship

Regional transportation planning and investment decisions provide the best return on public investments.



- **Objective 10.1 Infrastructure Condition** – Plan, build and maintain regional transportation assets to maximize their useful life, minimize project construction and maintenance costs and eliminate maintenance backlogs.
- **Objective 10.2 Sustainable Funding** – Develop new revenue sources to prepare for increased demand for travel on the transportation system as our region grows.

Note: Relevant RTP performance measures and targets from Chapter 7 will be added as the RTP is finalized.

GOAL 11: Transparency and Accountability

Regional transportation decisions are open and transparent and distribute the benefits and burdens of our investments in an equitable manner.



- **Objective 11.1 Meaningful Public and Stakeholder Engagement** – Engage more and a wider diversity people in providing input at all levels of decision-making for developing and implementing the plan, particularly people of color, English language learners, people with low income and other historically marginalized communities.
- **Objective 11.2 Performance-Based Planning** – Make transportation investment decisions using a performance-based planning approach that is aligned with the RTP goals and supported by meaningful public engagement, multimodal data and analysis.
- **Objective 11.3 Coordination and Cooperation** – Improve coordination and cooperation among the owners and operators of the region’s transportation system.

Note: Relevant RTP performance measures and targets from Chapter 7 will be added as the RTP is finalized.

2018 Regional Transportation Plan



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2018 Regional Transportation Plan

Chapter 3

Transportation System Policies to Achieve Our Vision

June 29, 2018

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3.0 INTRODUCTION

Purpose

Transportation shapes our communities and our daily lives, allowing us to reach our jobs and recreational opportunities, access goods and services, and meet daily needs. This chapter defines a broad range of policies for safety, transportation equity, climate, and emerging technology as well as a vision and supporting policies for each component of the regional transportation system – motor vehicle, transit, freight, bike and pedestrian – and management and operations of the system.



Find out more about the 2018 RTP at oregonmetro.gov/rtp.

The policies, if implemented, will help the region make progress toward the overall vision, goals and objectives for the regional transportation system defined in Chapter 2. They aim to integrate transportation and land use efforts to sustain the region's economic prosperity and quality of life and create a seamless and safe, reliable, healthy and affordable transportation system for all communities.

Together the network visions and policies in this will guide the development and implementation of the regional transportation system, informing transportation planning and investment decisions made by the Joint Policy Advisory Committee on Transportation (JPACT) and the Metro Council.

Chapter organization

This chapter is organized into the following sections:

3.1 Regional transportation system components: This section defines the components of the regional transportation system.

3.2 Overarching system policies: This section defines overarching policies for the regional transportation system related to safety, transportation equity, climate protection and emerging technology.

3.3 Regional network visions, concepts and policies: This section describes the vision (as defined in each network concept and functional classification map) and supporting policies to guide planning and investment in each part of the regional transportation system. The network concepts establish a vision and supporting policies for design and all types of travel – motor vehicles, transit, walking and bicycling – as well as the movement of goods and freight by road, air, water and rail.

3.1 REGIONAL TRANSPORTATION SYSTEM COMPONENTS

Regional multimodal transportation facilities and services are defined both by the function they serve and by where they are located. Facilities and services are included in the regional transportation system based on their function within the regional transportation system rather than their geometric design, ownership or physical characteristics.

A facility or service is part of the regional transportation system if it provides access to any activities crucial to the social or economic health of the greater Portland region, including connecting the region to other parts of the state and Pacific Northwest or provides access to and within 2040 Growth Concept centers, main streets, corridors and industrial and employment areas, as described below.

Facilities that connect different parts of the region together are crucial to the regional transportation system. Any link that provides access to or within a major regional activity center such as an airport or 2040 target area is also a crucial element of the regional transportation system.

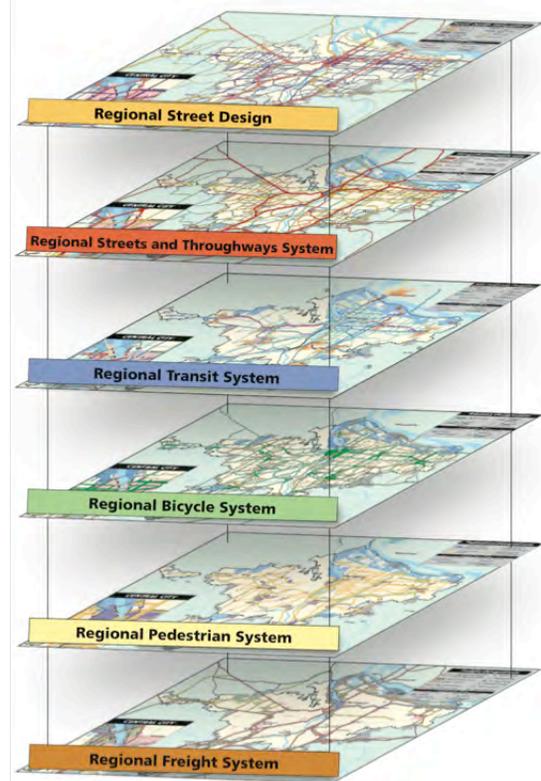
As a result, the regional transportation system is defined as:

1. All regional motor vehicle network facilities, including:
 - All state-owned transportation facilities (including interstate, statewide, regional and district highways and their bridges, overcrossings and ramps).
 - All city- or county-owned arterial facilities and their bridges.
2. Transportation facilities, including bicycle and pedestrian facilities, within designated 2040 centers, corridors, industrial areas, employment areas, main streets and station communities.

Regional Transportation System Components

Regional multimodal transportation facilities and services include the following:

1. Regional System Design and Placemaking
2. Regional Motor Vehicle Network
3. Regional Transit Network
4. Regional Freight Network
5. Regional Bicycle Network
6. Regional Pedestrian Network
7. Regional System Management & Operations which includes Demand Management



Regional Transportation System Components

3. All high capacity transit and regional transit networks and their bridges.
4. All regional bicycle and pedestrian facilities and their bridges, including regional trails shown on the regional pedestrian and bicycle networks.
5. All bridges that cross the Willamette, Columbia, Clackamas, Tualatin or Sandy rivers.
6. All freight and passenger intermodal facilities, airports, rail facilities and marine transportation facilities and their bridges.
7. Any other transportation facility, service or strategy that is determined by JPACT and the Metro Council to be of regional interest because it has a regional need or impact (e.g. transit-oriented development, transportation system management and demand management strategies, local street connectivity, and culverts that serve as barriers to fish passage).

These facilities are designated on the network maps in this chapter. Together, these facilities and services constitute an integrated and interconnected system that supports planned land uses and provides travel options to achieve the goals, objectives and policies of the RTP.

Visions, concepts, functional classification designations and supporting policies are described for each component in the next section.

3.2 OVERARCHING SYSTEM POLICIES

This section defines regional transportation system policies related to safety, transportation equity, climate protection and emerging technology.

3.2.1 Safety and Security Policies

Eliminating traffic related deaths and life changing injuries and increasing the safety and security of the transportation system is a top priority of the Regional Transportation Plan, as is prioritizing safety for people of color, people with low incomes, people with disabilities, people walking, bicycling, and using motorcycles, youth and older adults.

“Serious crashes” are Fatal and Severe Injury crashes combined

Preventing traffic related deaths and severe injuries is a critical public health and equity issue in the greater Portland region. Between 2011 and 2015, there were more than 116,000 traffic crashes resulting in 311 deaths and 2,102 people severely injured. On average, 62 people die each year on the region’s roadways and 420 people experience a life changing injury.

Traffic deaths and life changing injuries impact the lives of our families, friends, neighbors and community members. They also have a major economic cost – estimated at \$1 billion a year for the region. While the greater Portland region has one of the lowest crash rates in the country, the Regional Transportation Safety Strategy has adopted a Vision Zero target because no loss of life on our roadways is acceptable.

Transportation safety is protection from death or bodily injury from a motor-vehicle crash while engaged in travel.

Individual and public transportation security is protection from intentional criminal or antisocial acts while engaged in trip making.

Individual and public security while traveling is an important part of transportation safety. Unlike serious traffic crashes, the problem of individual and public security is less well documented. However, fears for personal security are often raised by community members in the region. The greater Portland region has the highest reported number of hate crimes in the United States and the tragic, racially motivated attack on a MAX train in 2017 have highlighted that not all people in the region are equally safe and secure while traveling. People walking, bicycling and taking public transit can feel and be especially vulnerable.

3.2.1.1 Regional Transportation Safety Strategy (2018)

The Regional Transportation Safety Strategy (“Safety Strategy”) identifies data-driven strategies and actions to address the most common types of crashes and contributing factors.¹ Key findings from the analysis of crash data from 2011-2015 can be found in Chapter 1 of the RTP.² More detailed findings are in the 2018 Metro State of Safety Report and the Safety Strategy.³

The Safety Strategy recommends **six strategies** to support achieving the region’s adopted Vision Zero target for 2035, shown in **Figure 3.1**. Each strategy includes specific actions. The strategies and actions are evidence-based and were identified in response to analysis of crash data in the 2018 Metro State of Safety Report and other sources. Refer to the Regional Transportation Safety Strategy for detailed information on each of the strategies and specific actions.

Figure 3.1 Regional Transportation Safety Strategies



¹ The Regional Transportation Safety Strategy, adopted in December 2018, is a topical plan and appendix of the Regional Transportation Plan.

² Oregon Department of Transportation crash data.

³ The Regional Transportation Safety Strategy is a topical plan of the Regional Transportation Plan. The 2018 Metro State of Safety Report is an appendix of the Safety Strategy. Both documents are appendices to the Regional Transportation Plan.

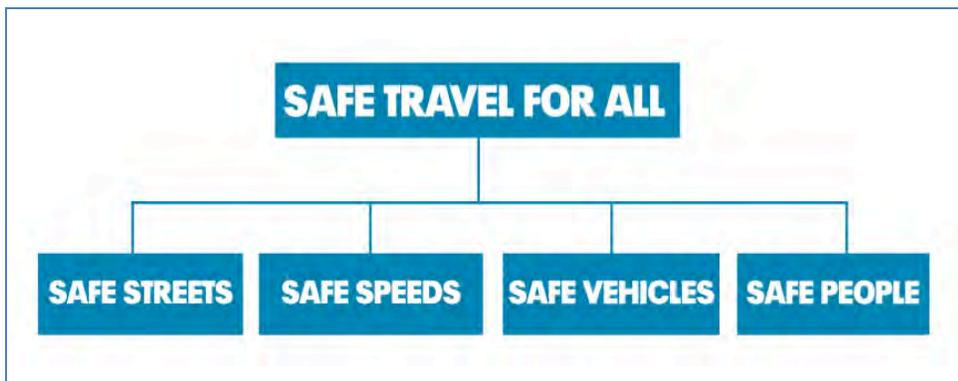
3.2.1.2 Using the Safe System approach

The Safety Strategy employs a Safe System approach. Vision Zero is a policy framework and strategy that uses a Safe System approach to achieve zero fatal and severe injury traffic deaths. It originated in Sweden and now other countries and many U.S. cities are using the framework. Similar frameworks are Toward Zero Deaths (U.S.), Road to Zero Coalition (National Safety Council), Safe System (New Zealand), and Sustainable Safety (Denmark).

The Safe System approach involves a holistic view of the transportation system and the interactions among travel speeds, vehicles, road users and the road itself. It is an inclusive approach that prioritizes safety for all user groups of the transportation system - drivers, motorcyclists, passengers, pedestrians, bicyclists, and commercial and heavy vehicle drivers.

Consistent with the region’s long-term safety vision, it acknowledges that people will always make mistakes and may have road crashes—but the system should be designed so that those crashes should not result in death or serious injury. Design emphasizes separation – between people walking and bicycling and motor-vehicles, access management and median separation of traffic – and survivable speeds.

Figure 3.2 Components of the Safe System Approach



Source: Vision Zero Network

The Safe System approach is focused on preventing all fatal and severe injury crashes. It recognizes that the responsibility for crash prevention resides not only with roadway users but with transportation professionals and decision makers. The Safe System approach has been shown to be more effective in reducing traffic deaths and severe injuries than more traditional approaches that focus on all crashes.⁴

The Safe System approach focuses on the following key guiding principles that shape how transportation safety is addressed.

⁴ Sustainable and Safe: A Vision and Guidance for Zero Road Deaths, World Resources Institute, Global Road Safety Facility (2017)

Figure 3.3 Guiding Principles of the Safe System approach

TRADITIONAL APPROACH	SAFE SYSTEM APPROACH
Some traffic deaths are INEVITABLE System is NOT FORGIVING of human failing Focus on and analyze all COLLISIONS REACT to crashes Saving lives is EXPENSIVE	It possible to PREVENT ALL traffic deaths Proactively integrate HUMAN FAILING into design Focus on and analyze FATAL and SEVERE CRASHES PROACTIVELY design a forgiving system Saving lives is NOT EXPENSIVE

Source: Metro

Refer to the Regional Transportation Safety Strategy for detailed information on the Safe System approach.

3.2.1.3 Regional High Injury Corridors and Intersections

Analysis in the 2018 Metro State of Safety Report found that a majority of serious crashes occurred on arterial roadways. Metro developed a methodology to identify which roadways in the region had the highest number of serious crashes (acknowledging that not all arterial roadways are designed the same and some roadways will have more safety issues than others). Refer to the Glossary for a description of the methodology used to identify the regional high injury corridors and intersections.

The analysis found that sixty percent of fatal and severe injury crashes occur on just six percent of the region’s roadways. These roadways are identified as regional high injury corridors and intersections. They are also where we tend to travel the most, where we run to catch the bus, cross the street to get to schools and shops, ride our bikes or drive.

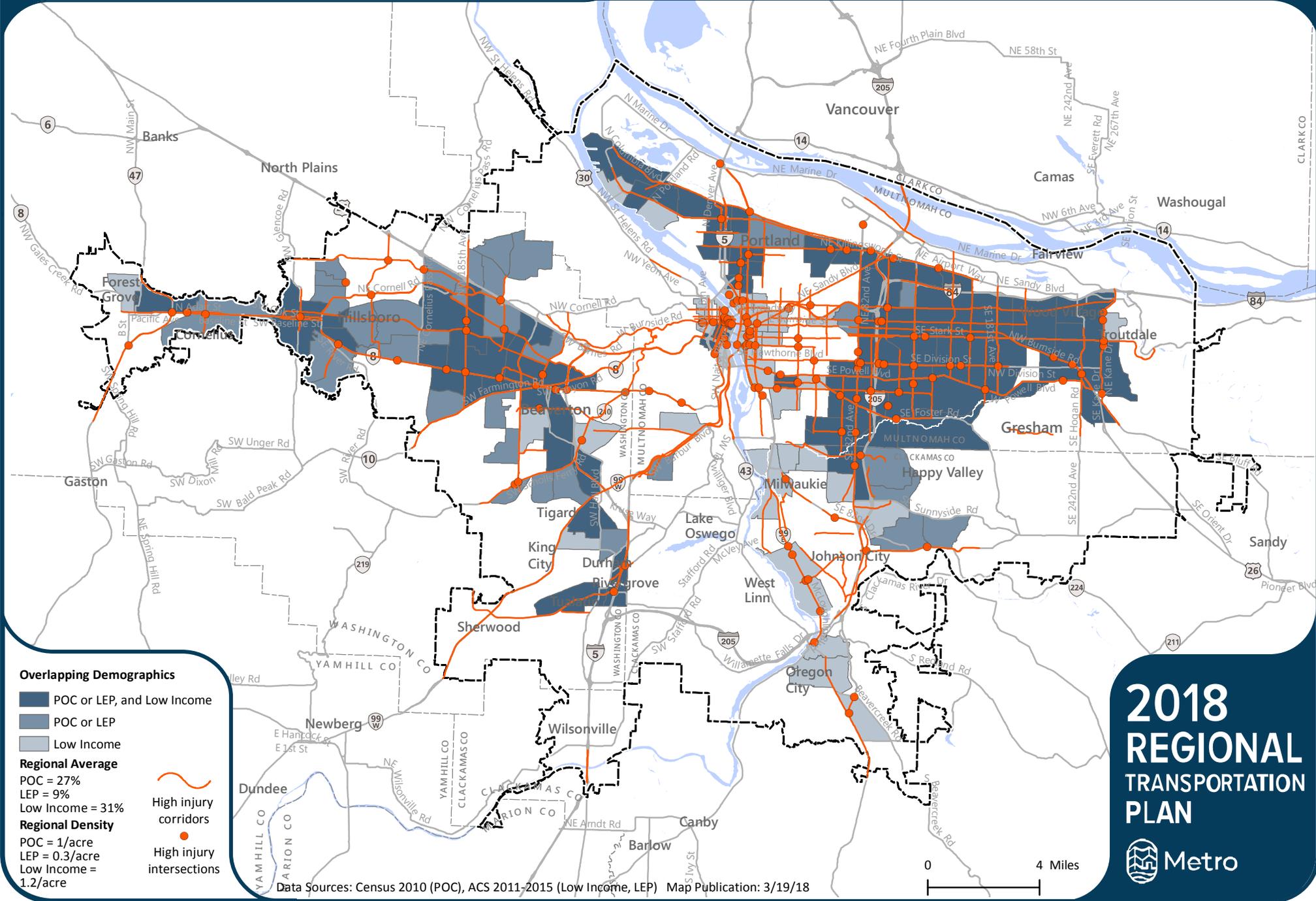
A majority of the high injury corridors and intersections – and a majority of pedestrian deaths and severe injuries – are in areas with higher concentrations of people of color, people with low incomes and English language learners. Implementing policies and actions to increase transportation safety and personal security for these community members, along with other vulnerable users, such as people walking and bicycling, will make the transportation system safer for all users.

Figure 3.4 shows the map of regional high injury corridors overlapping with communities of color, English language learners, and lower-income communities. The regional high injury corridors and Intersections are identified to help prioritize safety near term investments. Metro will update this map every five years. In the interim, other safety investments may be identified that warrant priority based on other data and analysis.

Figure 3. 4 Regional High Injury Corridors

High Injury Corridors Overlapping Communities of Color, English Language Learners, and Lower-Income Communities

This map shows the overlap of regional high injury corridors and road intersections with census tracts with higher than regional average concentrations and double the density of one or more of the following: people of color, people with low income, and English language learners. Census tracts where multiple demographic groups overlap are identified.



3.2.1.4 Safety and Security Policies

Regional Transportation Safety and Security Policies reflect the policy framework of the Regional Transportation Safety Strategy. Implementation of the policies supports achieving the regional Vision Zero target for 2035 and making travel in the region safer and more secure for all people.

Regional Safety and Security Policies

- | | |
|-----------------|--|
| Policy 1 | Focus safety efforts on eliminating traffic deaths and severe injury crashes to achieve Vision Zero. |
| Policy 2 | Prioritize safety investments, education and equitable enforcement on high injury and high risk corridors and intersections, with a focus on reducing speeds and speeding. |
| Policy 3 | Prioritize investments that benefit people with higher risk of being involved in a serious crash, including people of color, people with low incomes, people with disabilities, people walking, bicycling, and using motorcycles, people working in the right-of-way, youth and older adults. |
| Policy 4 | Prioritize safety considerations for all modes of travel and for all people in the planning, identification of gaps and deficiencies, investment decisions, design, construction, operation and maintenance of the transportation system, with a focus on reducing vehicle speeds. |
| Policy 5 | Make safety a key consideration in all transportation projects, and avoid replicating or exacerbating a known safety problem with any project or program. |
| Policy 6 | Employ a Safe System approach and use data and analysis tools and performance monitoring to support data-driven decision-making. |
| Policy 7 | Utilize safety and engineering best practices to identify low-cost and effective treatments that can be implemented systematically in shorter timeframes than large capital projects. |
| Policy 8 | Prioritize investments, education and enforcement that increase individual and public security while traveling by reducing intentional crime, such as harassment, targeting, and terrorist acts, and prioritize efforts that benefit people of color, people with low incomes, people with disabilities, women and people walking, bicycling and taking transit. |
| Policy 9 | Make safety a key consideration when defining system adequacy (or deficiency) for the purposes of planning or traffic impact analysis. |

Safety Policy 1. Focus safety efforts on eliminating traffic deaths and severe injury crashes to achieve Vision Zero.

To reach the goal of eliminating deaths and severe injuries from traffic crashes, this policy directs safety related efforts to focus on fatal and severe injury crashes, as opposed to all crashes. Focusing on serious crashes is a key tenant of the Safe System approach. It entails identifying where serious crashes occur and focusing on those locations, identifying the risk factors involved in serious crashes and addressing and eliminating those risks, focusing enforcement and education on high risk behaviors that lead to serious crashes and less or no enforcement or education on low risk behaviors. When enforcement is used precautions must be implemented to ensure equitable actions and outcomes.

Safety Policy 2. Prioritize safety investments, education and equitable enforcement on high injury and high risk corridors and intersections, with a focus on reducing speeds and speeding.

This policy directs safety investments, education and equitable enforcement to be prioritized on the corridors where the most serious crashes have occurred or have a risk of occurring (due to identified risk factors such as lack of roadway separation or excessive speeding). This policy approach, prioritizing corridors where deadly crashes are or could occur, more effectively uses limited resources where the most serious issues are. Additionally, this policy emphasizes the systemic approach to safety to addresses known safety risk factors corridor wide to prevent serious crashes from occurring in the future.

Safety Policy 3. Prioritize investment that benefit people with higher risk of being involved in a serious crash, including people of color, people with low incomes, people with disabilities, people walking, bicycling, and using motorcycles, people working in the right-of-way, youth and older adults.

This policy is based on the Safe System approach of prioritizing safety efforts on people with the highest risk of dying in a traffic crash as a key strategy to eliminating serious crashes overall. This policy also helps implement Metro's Strategic Plan for Advancing Equity, Diversity and Inclusion.

Safety Policy 4. Increase safety for all modes of travel and for all people through the planning, design, construction, operation and maintenance of the transportation system, with a focus on reducing vehicle speeds.

This policy requires that transportation safety be integrated into every aspect of the transportation system. It is a key element of the Safe System approach which takes a systemic and holistic approach. Safe travel speeds is a core element of achieving Vision Zero. Speed limits in Safe System approach are based on aiding crash avoidance and a human body's limit for physical trauma. An unprotected pedestrian hit at over 20mph has a significant risk of death or life-changing injury. A car in a side-on collision can protect its occupants up to around 30mph; a car in a head-on collision up to around 40mph. Establishing survivable speeds on streets where people using different modes at variable speeds and with different levels of physical protection are essential. Additionally, a diversity of users must be taken into account as the system is developed. For example,

people of color, older adults and children may have different needs that must be addressed at every phase.

Safety Policy 5. Make safety a key consideration in all transportation projects, and avoid replicating or exacerbating a known safety problem with any project or program.

While most policies are proactively focused on improving safety, this policy requires that transportation projects and programs clearly evaluate the impacts on all users of the transportation system and do not negatively impact any of those users by either replicating something which has been shown to increase safety problems for roadway users or making a current safety issue worse.

Safety Policy 6. Employ a Safe System approach and use data and analysis tools and performance monitoring to support data-driven decision-making.

The Safe System approach is proven to reduce serious crashes. The approach is based on data driven strategies and actions. Collecting, maintaining and analyzing data on a regular basis is critical to focusing investments where they will be most effective. Additionally, monitoring progress and assessing the outcome of investments in safety is crucial to learning from the past and improving in the future.

Safety Policy 7. Utilize safety and engineering best practices to identify low-cost and effective treatments that can be implemented systematically in shorter timeframes than large capital projects.

Many solutions to improve safety are inexpensive. This policy prioritizes addressing safety problems on a corridor level sooner rather than later to prevent serious crashes from occurring in the future. Rather than postponing safety interventions until a larger and more expensive project can be funded this policy directs that low-cost and effective treatments be implemented first.

Safety Policy 8. Prioritize investments, education and equitable enforcement that increase individual and public security while traveling by reducing intentional crime, such as harassment, targeting, and terrorist acts, and prioritize efforts that benefit people of color, people with low incomes, people with disabilities, women and people walking, bicycling and taking transit.

Individual and personal security while traveling has an important relationship to transportation safety, especially for people of color. Fear of harassment or being targeted can deter people of color from walking, bicycling or using transit and may increase the use of motor-vehicle transportation. Though individual and public security can be challenging to address, a variety of approaches are needed to create a safe and welcoming transportation system, including: collecting data, utilizing Crime Prevention Through Environmental Design, taking into account a diversity of users when developing and operating the transportation system, educating people to look out for and care for one another, designing security into projects (such as street lighting, visibility, call boxes), equity training for public safety and transportation professionals, and including a wide range of groups in design and decision making.

Safety Policy 9. Make safety a key consideration when defining system adequacy (or deficiency) for the purposes of planning or traffic impact analysis.

This policy specifies that safety data, analytical tools and metrics must be part of the evaluation when defining the adequacy of capacity on the transportation system. To design and operate safe roadways, there is a need to evaluate the impacts of increased capacity to safety.

3.2.2 Transportation Equity Policies

Oregon has a long and unfortunate history is rooted in racial bias and exclusion, which has contributed to the greater Portland region having less racial diversity than many other metropolitan regions. As early as 1844, when Oregon was a territory of the United States, acts to exclude Blacks and Mulattoes from Oregon were passed, including the infamous “Lash Law.” This law required that Blacks in Oregon be whipped twice a year until he or she left the territory. In 1857, exclusionary laws were voted into the Oregon territory’s Bill of Rights. Then in 1859, when Oregon became a part of the union, it was the only state with a racial exclusion law written into a state’s constitution. The law, while no longer enforced, remained in the state constitution until 2000.

Through the 1940s, government policies prevented people of color from buying or renting homes outside of designated neighborhoods, while Japanese residents were relocated to internment camps during World War II. Through the 1960s and 70s – or later – real estate agents would discourage non-White clients from homes in White neighborhoods, and banks would often refuse loans for those properties when requested by a person of color. Meanwhile, banks would declare investments in homes in African American neighborhoods or other communities of color too risky and refuse loans for those properties.

Implicit and explicit practices of racial exclusion and bias extended to the development of the transportation system. People of color in Oregon had to pay additional surcharges on car insurance up until 1951. When Interstate 5 opened in the 1960s, the new freeway cut a

Defining terms

Historically marginalized communities

Groups who have been denied access and/or suffered past institutional or structural discrimination in the United States, including: people of color, people with low English proficiency, people with low income, youth, older adults and people living with disabilities

Transportation equity

The removal of barriers to eliminate transportation-related disparities faced by and improve equitable outcomes for historically marginalized communities, especially communities of color

Racial equity

The removal of barriers with a specific focus on eliminating disparities faced by and improving equitable outcomes for communities of color – the foundation of Metro’s adopted equity strategy with the intent of also effectively identifying solutions and removing barriers for other disadvantaged groups

Equity focus areas

Communities where the rate of people of color, people in poverty and people with low English proficiency is greater than the regional average and double the density of one or more of these populations

swath through Portland's established African American neighborhoods, destroying at least 50 square blocks of homes and creating a barrier that still exists today.

Today, communities of color continue to point to issues of racial bias and inequity in enforcement of traffic laws and transit fares. Studies have also shown that drivers in the greater Portland region are significantly less likely to stop to allow an African American pedestrian to safely cross the street. Additionally, people of color are more likely to be victims of traffic fatalities and severe injuries.

The RTP reflects a regional commitment to plan and invest in the region's transportation system to reduce transportation-related disparities and barriers faced by communities of color and other historically marginalized communities, regardless of race, language proficiency, income, age or ability.

The policies in this section provide direction as to how Metro, working in partnership with marginalized communities, jurisdictions and other partners, will prioritize racial and transportation equity in regional transportation planning and decision-making. These policies informed development of the 2018 RTP, including the safety and modal network policies in this chapter, the plan's project priorities in Chapter 6 and implementation activities described in Chapter 8.

Why is a Focus on Racial Equity Important?

The goal of a racial equity focus is to reach a time when race can no longer be used to predict life outcomes and outcomes for all groups are improved. In the transportation context, this means addressing and closing the disparities gap for historically marginalized communities, with emphasis on people of color, English language learners, and people with low-incomes, in areas identified by these communities as priorities for the regional transportation system. These priorities include, but are not limited to: accessibility, mobility, safety, affordability and environmental health.

Like most of the nation, communities in the greater Portland region today are more diverse than in previous generations and, by the year 2045, communities of color are projected to be the majority. Unfortunately, most communities of color in the greater Portland region currently experience the worst economic and social outcomes of any demographic group, due to a long history of persistent, exclusionary and discriminatory policies which have barred communities of color – regardless of income, education, language proficiency or age – from the opportunities extended to many white residents. As a result, the region struggles with racial disparities across nearly every measure of well-being and prosperity, including housing, transportation, access to nature, education and health.

In order for the greater Portland region to be environmentally sustainable and economically prosperous, the region must proactively address racial disparities and tackle the most pervasive challenges not allowing members of the greater Portland region to thrive. Focusing on racial disparities and barriers will help develop and maintain

sustainable economic growth by fostering greater racial inclusion and smaller racial income gaps.⁵ This, in turn, will allow communities facing the greatest barriers opportunities to flourish, build generational wealth and, ultimately, succeed. Policies, projects and strategies that address these disparities will help other marginalized groups, including lower-income white households, older adults, youth and people with disabilities flourish.

The greater Portland region's economic prosperity and quality of life depend on an equitable transportation system that provides every person and business in the region with access to safe, efficient, reliable, affordable and healthy travel options and have the fair opportunity to thrive, regardless of their race or ethnicity. Investment in the region's transportation system is one important tool in reducing disparities and barriers experienced by communities of color. But the tool must be intentional and deployed with focus to be successful in reducing racial disparities rather than exacerbating disparities.

With a transportation system focused on mobility and access that addresses the transportation disparities and barriers faced by communities of color, the region's transportation system has the ability to open opportunities that can dramatically improve outcomes for all historically marginalized communities. While on the surface, a focus on racial equity may seem exclusionary, by addressing the most challenging shared barriers faced by those communities, outcomes for other marginalized communities will improve as well.⁶

3.2.2.1 Metro's Strategic Plan to Advance Racial Equity, Diversity, and Inclusion (2016)

In 2010, the Metro Council adopted equity as one of the region's six desired outcomes. Adopted by the Metro Council in June 2016, Metro's *Strategic Plan to Advance Racial Equity, Diversity, and Inclusion* (Strategic Plan) is a major milestone in the agency's efforts to define, implement and measure equity in the greater Portland region.

The Strategic Plan's purpose is to provide a strategic approach to incorporating equity into policy, decision-making and programs. The Strategic Plan to Advance Racial Equity, Diversity, and Inclusion provides clarity and direction to Metro's different lines of business related to integrating and approaching equity in planning, operations, and services.

⁵ Treuhaft, S., Blackwell, A.G., & Pastor, M. (2012). America's Tomorrow: Equity is the Superior Growth Model. Retrieved January 2016: www.policylink.org/sites/default/files/SUMMIT_FRAMING_WEB_20120110.PDF

⁶ To learn more about racial equity as an inclusionary strategy to help other marginalized groups (i.e. low-income households, people with disabilities, older adults), see resources, including: Metro's Strategic Plan to Advance Racial Equity, Diversity, and Inclusion or PolicyLink.

Moving forward, the Strategic Plan provides unified strategic direction to have the RTP place an additional focus on race for the crucial equity work currently underway at Metro, but not at the exclusion of income disparities regardless of race and ethnicity.

3.2.2.3 Regional Transportation equity focus areas

Informed through discussions of the transportation equity work group, regional advisory committees – TPAC, MTAC, JPACT and MPAC – and four Regional Leadership Forums, and direction from the Metro Council, the Regional Transportation Plan focuses on three historically marginalized communities:

- People of Color - Persons who identify as non-white.
- English Language Learners - Persons who identify as unable “to speak English very well.”
- People with Lower Income – Persons with incomes equal to or less than 200% of the Federal Poverty Level (2016)

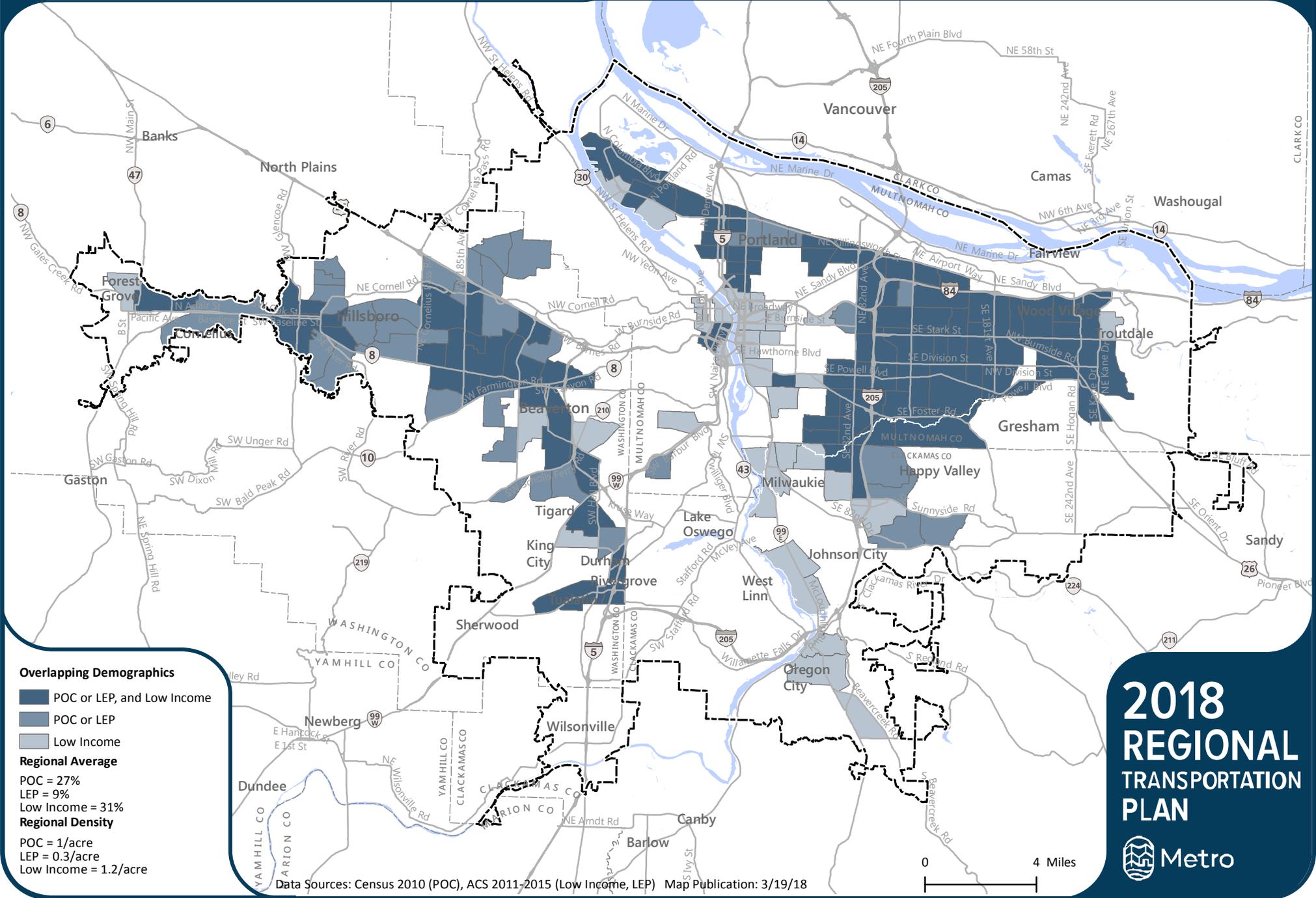
These three communities are the emphasis and focus for the Regional Transportation Plan, but not with exclusivity to the needs of other marginalized communities, including young people, older adults and people living with disabilities.

Figure 3.5 illustrates where different historically marginalized communities reside in the region, based on the best available U.S. Census Bureau and Oregon Department of Education data at the start of the 2018 RTP. The map reflects where there is a significant regional concentration of people of color, people with limited english proficiency and people with lower incomes.

Figure 3. 5 Historically Marginalized Communities in the greater Portland regoin

Communities of Color, English Language Learners, and Lower-Income Communities

This map shows census tracts with higher than regional average concentrations and double the density of one or more of the following: people of color, people with low income, and English language learners. Census tracts where multiple demographic groups overlap are identified.



3.1.2.4 Transportation Equity Policies

The Transportation Equity policies in this section aim to eliminate transportation-related disparities and barriers⁷ identified by historically marginalized communities as priorities to address through the RTP and regional transportation planning and decision-making processes. The policies provide direction as to how Metro, working in partnership with marginalized communities, jurisdictions and other partners, will prioritize transportation equity in regional transportation planning and decision-making.

Regional Transportation Equity Policies

- Policy 1** Embed equity into the planning and implementation of transportation projects, programs, policies and strategies to comprehensively consider the benefits and impacts of transportation and eliminate disparities and barriers experienced by historically marginalized communities, particularly communities of color and people with low income.
- Policy 2** Ensure investments in the transportation system anticipate and minimize the effects of displacement and other affordability impacts on historically marginalized communities, with a focus on communities of color and people with low income.
- Policy 3** Prioritize transportation investments that eliminate transportation-related disparities and barriers for historically marginalized communities, with a focus on communities of color and people with low income.
- Policy 4** Use inclusive decision-making processes that provide meaningful opportunities for communities of color, people with low income and other historically marginalized communities to engage and participate in the development and implementation of transportation plans, projects and programs.
- Policy 5** Use engagement and other methods to collect and assess data to understand the transportation-related disparities, barriers, needs and priorities of communities of color, people with low income and other historically marginalized communities.
- Policy 6** Evaluate transportation plans, policies, programs and investments to understand how they address transportation-related disparities and barriers experienced by communities of color, people with low income and other historically marginalized communities and the extent disparities are being eliminated.
- Policy 7** Support family-wage job opportunities and a diverse construction workforce through inclusive hiring practices and contracting opportunities for investments in the transportation system.

⁷ Transportation-related disparities and barriers identified by historically marginalized communities as priorities to address include safety, access, affordability and community health.

Because the Regional Transportation Equity Policies do not have a separate topical plan, specific implementing actions have been included for each transportation equity policy.

Transportation Equity Policy 1. Embed equity into the planning and implementation of transportation projects, programs, policies and strategies to comprehensively consider the benefits and impacts of transportation and eliminate disparities and barriers experienced by historically marginalized communities, particularly communities of color and people with low income.

Research nationally, statewide and locally demonstrate historically marginalized communities, particularly communities of color, experience a number of transportation-related disparities which creates additional barriers preventing these communities from thriving. These include the following:

- Pedestrian fatality rates for African Americans are 60 percent higher than for non-Hispanic whites, and 43 percent higher for Hispanics than whites.
- Nearly 20 percent of African-American households, 14% of Latino households, and 13 percent of Asian households live without a car.
- Racial minorities are four times more likely than Whites to rely on transit for their work commute.⁸

Transportation, as a vehicle for mobility and accessibility, plays a significant intersectional role in reducing the disparities gap, but historically, its development and operation has contributed to the disparities gap. The history of using transportation infrastructure projects as an urban renewal mechanism led to the destruction of thriving communities, particularly communities of color across the nation. In Portland, this is no different, where the development of the interstate freeway system displaced communities of color and lower-income homes, most notably the African American community.

Since the asphalt and concrete was poured, the lessons learned from the generational impacts of the interstate system on marginalized communities necessitates that to achieve the RTP goal of equitable transportation, embedding equity considerations are essential to each step of the planning and implementation process for transportation projects, programs, policies and strategies. The equity considerations must reflect the priorities these marginalized communities voiced for the transportation, which may include, but not limited to: accessibility, safety, community health, and affordability. To embed equity into planning and implementation requires a paradigm shift as to how transportation is currently built and operated. This includes bringing in unheard voices from project or policy inception all the way through construction to understand the perspective of potential benefits or impacts.

Additionally, transportation investments must consider the different ways in which it can advance equity and not narrow the purview to one dimension. A transportation

⁸ Statistics from PolicyLink and the Transportation Equity Caucus.

investment has the ability to provide greater access to support marginalized communities reach educational facilities or new job opportunities, but a transportation investment also offers contracting and hiring opportunities. By embedding equity into transportation comprehensively, a full view and consideration of the benefits and impacts of transportation can be understood and weighed.

Actions to implement Transportation Equity Policy 1:

- Integrate consideration of equity in the planning and implementation of transportation projects, policies and programs by:
 - Formally acknowledging transportation-related disparities experienced by historically marginalized communities in the greater Portland region. This would also acknowledge the history and effect (past and present) of the region's built environment, including the capital construction of the roadway system, has played a role in widening of the disparities gap.
 - Acknowledge and recognize the intersectional role of transportation in alleviating the disparities gap for historically marginalized communities.
- Look closely at different opportunities for how equity considerations can be brought into the transportation discussion, with a focus on outcomes.
- Commit to looking at equity and finding different ways to integrate equity in each step of the transportation planning and implementation process.
 - Continually assess equity impacts at every stage of the process. As the process begins, and throughout, ask who will benefit, who will pay and who will decide; and adjust decisions and policies as needed to ensure equitable impacts.
- Bring in voices from marginalized communities to add perspective and help guide how equity can be embedded in the planning and decision-making process. Also see

Transportation Equity Policy 2. Ensure investments in the transportation system anticipate and minimize the effects of displacement and other affordability impacts on historically marginalized communities, with a focus on communities of color and people with low income.

A trend observed across many western U.S. cities is that with a severe deficit of housing supply, particularly affordable units, the addition of an economic trigger such as a major transportation investment gentrifies and changes communities. Historically marginalized communities are finding themselves further away from neighborhoods with better transportation options as well as access to numerous jobs and community places. The result has created further stress on the transportation system to serve displaced historically marginalized communities. Portland is not immune to these trends. Over time, former ethnic and new immigrant neighborhoods near the region's core with great access have gentrified, displacing a number of communities which have an established a history associated with these places. The 2040 growth centers, as appealing and desirable, are not keeping pace with a mix of affordable housing to keep existing residents while transportation investments are being made. Ultimately this creates a vicious cycle of increased transportation access to those who have the financial means to afford travel options and the benefits not born to the existing community.

The success, sustainability and prosperity of the region relies on how well the region manages issue of displacement as infrastructure investments are made. But too often the silos of transportation and land use prevent coming to agreement on creative solutions which can mitigate and proactively address displacement. The greater Portland region is renowned for breaking down the transportation and land use silo, but displacement is a pervasive challenge that requires further collaboration across disciplines and acknowledgement by all transportation professionals they are part of the solution and not an outside observer. To ensure investment in the transportation system anticipate affordability impacts and the effects of displacement, planning and implementation of transportation investments must be coordinated with the surrounding land use, take extra care and consideration of the demographic factors in the surrounding area in evaluating the displacement risk, implement land use strategies prior to the transportation investment, engage the historically marginalized communities at risk, and imbed funding commitments.

Actions to implement Transportation Equity Policy 2:

- Focus on capital transportation investments that have proactively developed a compendium of strategies to avoid and minimize involuntary displacement.
 - Demonstrate how intersectional issues of housing affordability and displacement are being addressed proactively in plans and programs prior to capital investment in transportation infrastructure.
 - In compendium, look at the land use solutions and survey what is necessary in land use policy to avoid and mitigate involuntary displacement.
- Collect data and build analysis tools that can assess and monitor transportation and housing affordability issues and share the information to partners in order to help inform capital investment decisions.
- Increase the number of units of regulated affordable housing in proximity to frequent transit service and in 2040 growth centers as well as communities with rich access to travel

Transportation Equity Policy 3. Prioritize transportation investments that eliminate transportation-related disparities and barriers for historically marginalized communities, with a focus on communities of color and people with low income.

To achieve the RTP goal of equitable transportation, efforts to close the gap marginalized communities experience relative to outcomes the transportation system contributes to is vital. Transportation outcomes identified as priorities by historically marginalized communities include affordability, safety, access and environmental health. In focusing on reducing the disparities gap, the most progress can be made and resources be deployed more effectively. To focus on eliminating disparities is a paradigm shift in current practices of transportation and means approaching transportation plans, programs, policies and investments under the lens of fairness rather than equality.

While there is a desire to see the benefits and impacts of transportation distributed equally across everyone, an approach which does not intentionally focus on equitable outcomes does not help close the disparities gap caused by a pervasive system which

erected barriers and separated the level of benefit for certain communities over others. Eliminating the disparities gap is also a long-term commitment and significant undertaking as no one project can undo system-wide disparities which have been compounded over years. Nonetheless, in focusing on eliminating the disparities brought on by the transportation system's development and operation, not only will historically marginalized communities see the benefits, but the region will see benefits spread across all communities.

To begin to focus on the disparities gap, it is imperative for marginalized communities to provide the direction and prioritization of which disparities to tackle first and the best methods to do so. Through the development of the 2018 RTP, engagement with historically marginalized communities and through a retrospective process elevated the need for the transportation system to provide greater accessibility, be safer for all users, be more affordable for users, and finally not detriment the health and well-being of all communities, but particularly historically marginalized communities as they have shouldered the brunt of environmental impacts.

As a starting point and a way to begin focusing on addressing the disparities gap immediately, an intentional focus is necessary with the prioritization of the allocation of resources to focus on those outcomes that marginalized communities have identified as the priorities for their communities and within their communities in the near- and the long-term. This should also be done with continual engagement through implementation and future prioritization processes to reflect new priorities or other unforeseen issues. *Also see Transportation Equity Policies 4 through 6.*

Actions to implement Transportation Equity Policy 3:

- Commit to and focus on addressing the disparities gap for historically marginalized communities systematically to understand the progress in which transportation alleviates.
 - Define a way of measuring and tracking progress to understand how effectively disparities are being addressed.
- Actively question how the plan, program, policies, strategies, or action being undertaken contributes to reducing and eliminating the disparities gap.
- Actively recognize and put aside implicit partialities and biases.
- More specifically for the outcomes of safety, access, affordability and public health, prioritize the following:
 - Among the multiple priorities for the region’s transportation system, prioritize and advance the equity elements of the priority. For example, in looking at a transportation investment focused on safety, advance the element that would benefit communities of color over a general safety benefit.
 - Prioritize building out the active transportation infrastructure network in areas where there are gaps and deficiencies. Focus on completing gaps in communities of color as a means of prioritizing equity. This includes advancing the completion of access to transit in historically marginalized communities.
 - Implement the Regional Travel Options Strategy, including the new Safe Route to School program, with emphasis to support new partnerships with organizations that serve historically marginalized communities.
 - Prioritize the safety of the transportation system, especially in historically marginalized communities, but focus on addressing the systemic safety issues on high injury corridors which historically marginalized communities traverse. Focus on increasing safety in high-risk locations and on high injury corridors that coincide with higher residential concentrations of historically marginalized communities.
 - Prioritize and focus on increasing active transportation and transit access to jobs and community places (e.g., libraries, pharmacies, grocery stores, schools, etc.) and services for historically marginalized communities. Place an emphasis on connecting historically marginalized communities to middle-wage employment opportunities.
- Focus on different transit solutions transit that serve historically marginalized communities.
 - This may include creative solutions such as community and job connector shuttle services.
 - Focus increases in service on transit routes that serve a significant portion of historically marginalized communities.
 - While not the most productive and efficient from a strict transit management view, consider coverage transit service routes to support historically marginalized communities as they navigate the shifting housing affordability dynamics.
 - Support special needs transportation providers.
- Complement affordable housing and transit-oriented development to support the integration of land use and transportation where historically marginalized communities have the ability to benefit.
 - Ensure the long-term sustainability of programs that make transportation affordable, including the adult low-income fare and student pass programs on transit.
 - Complement and cross-implement the strategies in the *Coordinated Transportation Plan for Seniors and People with Disabilities* in Appendix G.

Transportation Equity Policy 4. Use inclusive decision-making processes that provide meaningful opportunities for communities of color and other historically marginalized communities to engage in the development and implementation of transportation plans, projects and programs.

To achieve an equitable transportation system that eliminates the disparities gaps and barriers experienced by marginalized communities, a meaningful and inclusive decision-making process is critical to understand the perspectives and experiences of historically marginalized communities and build plans, projects, and programs to address these perspectives and experiences.

Meaningful and inclusive engagement takes a significant effort and relies on building relationships and trust with members of marginalized communities, which is a significant change from the conventional practices of public involvement in the transportation sector, which places barriers to being involved. Engagement and inclusion is part of embedding equity by allowing for marginalized communities to be seen, heard and considered, and allow for their needs and priorities to influence the planning and decision-making process.

Actions to implement Transportation Equity Policy 4:

- Shift the burden of outreach and engagement away from marginalized communities to reduce the barriers to participation in public processes for these communities.
 - Transportation professionals should look to reduce the barriers for marginalized communities to participate (e.g. go out into the community, offer language translation and childcare services, provide food and incentives) and reach out to marginalized communities in meaningful ways (e.g. engaging through a community liaison, allowing communities to lead the discussion) and at opportunities to shape and influence transportation plans, policies and program (e.g. not at a perfunctory time).
- Consider resourcing an on-call contract of community outreach liaisons who are trusted members of historically marginalized communities and to help facilitate relationship-building, conversations, and meaningful engagement.
- Set aside resources specifically for meaningfully engaging historically marginalized

Transportation Equity Policy 5. Use engagement and other methods to collect and assess data to understand the transportation-related disparities, barriers, needs and priorities of communities of color and other historically marginalized communities.

To understand the transportation disparities, needs, gaps, and priorities of historically marginalized communities, particularly communities of color, conventional practices of data collection and analysis does not capture and articulate the nature of disparities experienced by different marginalized communities. While national datasets or statewide statistics are able to provide the picture of disparities, to address the disparities gap fully, the lacking data and information gaps at a localized level impacts the ability to assess the performance of transportation plans, programs, and policies on the outcomes and priorities identified historically marginalized communities.

The need to collect more disaggregated data with confidence at a localized scale gives the ability to look in-depth at localized conditions on key transportation outcomes identified as priorities by historically marginalized communities – affordability, safety, access, and environmental health – is necessary to understand the current level of disparities and establish an appropriate baseline. Until the data need is fulfilled, it is imperative to supplement data collection and assessment with engagement to gather the qualitative information directly from historically marginalized communities. The information collected helps to better represent and articulate the disparities experienced and needs of historically marginalized communities to help bring focus.

Additionally, in supplementing engagement as part of data collection, the process helps to confirm needs, gaps, and deficiencies which may have already been identified. In facilitating greater attention to data collection and assessment focused on the needs and priorities of historically marginalized communities, particular communities of color, transportation professionals have further ability and information to plan, program, and implement strategies or actions which can better address the priorities and needs.

Actions to implement Transportation Equity Policy 5:

- Collect data in a manner that facilitates looking at outcomes with an equity lens.
 - Collect localized disaggregated data.
 - Emphasize collecting as much qualitative data as quantitative data.
 - Collect data that is meaningful to historically marginalized communities.
- Appropriately resource data collection and assessment to focus on outcomes with an equity lens.
 - Acknowledge and recognize data collection and assessment methods will be unfamiliar and new for many project managers and likely to be a necessary, but challenging to break convention
- Appropriately resource the development of a disparities baseline looking at measures of affordability, safety, access, and environmental health to understand the disparities gap between historically marginalized communities, in particular people of color.
- Conduct meaningful engagement with historically marginalized communities to supplement

Transportation Equity Policy 6. Evaluate transportation plans, policies, programs and investments to understand the extent to which transportation-related disparities and barriers experienced by communities of color and other historically marginalized communities are being eliminated

To know and to be accountable to whether transportation plans, programs, policies and strategies are making progress towards eliminating the disparities gap, particularly in access, safety, affordability, community health and any other transportation-related priority identified by historically marginalized communities, evaluation under the lens of what disparities the plans, policies, programs and strategies address is just as crucial as engagement, prioritization and mitigation. The assessment process helps to understand effectiveness, progression, monitoring and accountability in achieving the equitable

transportation and other associations RTP goals and objectives. Evaluation also provides transparency towards what to expect as a result.

Actions to implement Transportation Equity Policy 6:

- Resource evaluation methodology development appropriately.
 - Recognize the potential and the necessity to disaggregate and evaluate system-wide as well as by individual project, program or community.
 - Let the evaluation be led, guided and verified by historically marginalized communities and their lived experiences.
 - Ground truth evaluation results through engagement.
- Be willing to use non-standard forms of evaluation.
 - Clearly state assumptions and recognize what the method may be testing and the limitations of the evaluation.
- Set up a long-term feedback loop of evaluation and monitoring.
 - Evaluate at each stage and monitor whether projected outcomes are coming to fruition and/or whether plans, policies, programs and strategies may need additional mitigations or a course correction.

Transportation Equity Policy 7. Support living-wage job opportunities and a diverse construction workforce through inclusive hiring practices and contracting opportunities for investments in the transportation system.

The construction industry has seen tremendous growth in the last ten years and is one of the fastest-growing industries in recent years, outpacing the rest of the economy. The median wage for construction occupations is higher than the median wage across all sectors in the greater Portland region. It is one of the remaining sectors where workers can make a living-wage income without a higher education degree. Yet the industry has an aging workforce and with continued growth, this creates an opportunity to link the region's unemployed and underemployed to apprenticeship programs that lead to careers in the industry. Construction has historically been a racially homogenous industry, yet labor market data indicates a shortage in skilled talent. Diversifying the construction workforce will not only help create a stronger supply of needed workers for the industry, it will also directly address issues of poverty and economic mobility within communities of color and working families in the region.

Transportation infrastructure projects, in particular, can have a big impact on promoting equitable growth in the region's economy by providing job opportunities for people of color in the construction trades. While federal and state laws have provisions which facilitate greater access for minority, women-owned and disadvantaged businesses (MWDDBE) to be part of these contracting and construction opportunities, the construction industry has a workforce which is not reflective of demographics. Yet it remains a sector that provides access to living-wage careers for historically marginalized communities, particularly communities of color.

The RTP, is a long-range transportation blueprint for the capital investments needed to accommodate existing needs and future populations and employment growth. An

emphasis on the construction workforce is relevant to building out the transportation system equitably and making progress towards reducing the disparities seen among historically marginalized communities in terms of living-wage career opportunities and longer-term income stability and affordability. By focusing public investments to advance contracting and workforce equity in the construction trades, transportation infrastructure projects can help mitigate wealth disparity gaps experienced by historically marginalized communities.

Actions to implement Transportation Equity Policy 7:

- Formalize reporting of minority, women-owned and disadvantaged businesses construction contracts and workforce diversity utilization on all Metro-funded transportation projects.
- For transportation investments programmed within the MTIP, particularly as part of the construction phases, request from partners information about minority, women-owned and disadvantaged business contracting and workforce diversity utilization.
- Through partnership with Metro’s Diversity, Equity and Inclusion program, provide information and resources to partners on ways to support and advance equity in contracting and workforce.
- Develop mechanisms to incentivize partners to pursue recruitment and retention strategies on transportation projects that help grow and diversify the construction workforce.
- Encourage apprenticeships with historically marginalized communities as part of contracts.
- Partner with workforce development organizations to improve outreach, share information and leverage resources that support and grow a diverse construction workforce and contracting community.

3.2.3 Climate Leadership Policies

Climate change may be the defining challenge of this century. Global climate change poses a growing threat to our communities, our environment and our economy, creating uncertainties for the agricultural, forestry and fishing industries as well as winter recreation. The planet is warming and we have less and less time to act. Documented effects include warmer temperatures and sea levels, shrinking glaciers, shifting rainfall patterns and changes to growing seasons and the distribution of plants and animals.

Warmer temperatures will affect the service life of transportation infrastructure, and the more severe storms that are predicted will increase the frequency of landslides and flooding. Consequent damage to roads and rail infrastructure will compromise system safety, disrupt mobility and hurt the region's economic competitiveness. Our ability to respond will have unprecedented impacts on our lives and our survival.

Transportation sources account for 34 percent of greenhouse gas emissions in Oregon, largely made up of carbon dioxide (CO₂). Since 2006, the state of Oregon has initiated a number of actions to respond including directing the greater Portland region to develop and implement a strategy for reducing greenhouse gas emissions from cars and small trucks.

3.2.3.1 Climate Smart Strategy (2014)

The Regional Transportation Plan is a key tool for the greater Portland region to implement the adopted Climate Smart Strategy and achieve greenhouse gas emissions reduction targets adopted by the Land Conservation and Development Commission in 2012 and 2017.

As directed by the Oregon Legislature in 2009, the Metro Council and the Joint Policy Advisory Committee on Transportation (JPACT) developed and adopted a regional strategy to reduce per capita greenhouse gas emissions from cars and small trucks by 2035 to meet state targets. Adopted in December 2014 with broad support from community, business and elected leaders, the Climate Smart Strategy relies on policies and investments that have already been identified as local priorities in communities across the greater Portland region. Adoption of the strategy affirmed the region's shared commitment to provide more transportation choices, keep our air clean, build healthy and



The 2018 Regional Transportation Plan is a key tool for the greater Portland region to implement the adopted Climate Smart Strategy.

For more information, visit www.oregonmetro.gov/climatesmart

equitable communities, and grow our economy – all while reducing greenhouse gas emissions.

Analysis of the adopted strategy demonstrated that with an increase in transportation funding for all modes, particularly transit operations, the region can provide more safe and reliable transportation choices, keep our air clean, build healthy and equitable communities and grow our economy while reducing greenhouse gas emissions from light-duty vehicles as directed by the Legislature. It also showed that a lack of investment in needed transportation infrastructure will result in falling short of our greenhouse gas emissions reduction goal and other desired outcomes.

3.2.3.2 Climate Smart Strategy policies

The Climate Smart Strategy is built around nine policies to demonstrate climate leadership by reducing greenhouse gas emissions from cars and small trucks while making our transportation system safe, reliable, healthy and affordable. The policies listed below complement other RTP policies related to transit, biking and walking, use of technology and system and demand management strategies.

Climate Smart Policies	
Policy 1	Implement adopted local and regional land use plans.
Policy 2	Make transit convenient, frequent, accessible and affordable.
Policy 3	Make biking and walking safe and convenient.
Policy 4	Make streets and highways safe, reliable and connected.
Policy 5	Use technology to actively manage the transportation system and ensure that new and emerging technology affecting the region’s transportation system supports shared trips and other Climate Smart Strategy policies and strategies.
Policy 6	Provide information and incentives to expand the use of travel options.
Policy 7	Make efficient use of vehicle parking spaces through parking management and reducing the amount of land dedicated to parking
Policy 8	Support Oregon’s transition to cleaner fuels and more fuel-efficient vehicles in recognition of the external impacts of carbon and other vehicle emissions.
Policy 9	Secure adequate funding for transportation investments that support the RTP Climate Protection goal and objectives.

The responsibility of implementation of these policies and the Climate Smart Strategy does not rest solely with Metro. Continued partnerships, collaboration and increased funding from all levels of government will be essential. To that end, the Climate Smart Strategy also identified actions that can be taken by the state, Metro, cities, counties and others to

support implementation and performance monitoring targets to enable the region to monitor and report on progress. Monitoring progress is described in Chapter 8 of the Plan.

3.2.4 Emerging Technology Policies

What is Emerging Technology?

Over the past decade, a number of new developments in technology have begun to reshape the way that people travel. Over three-quarters of adults now own a smartphone, often including apps that provide instant access to information on travel choices. A number of new services combine smartphones with social networking, online payment, and global positioning systems to connect people with vehicles and rides. Most auto manufacturers now offer hybrid or electric vehicles, and the cost of these vehicles has been falling, giving more people access to clean transportation options. Soon, vehicles that drive themselves will hit our streets, which could dramatically transform our relationship with cars.

There are so many new technologies shaping transportation that we need a new vocabulary to describe them. We use the blanket term **emerging technology** to encompass all of these new developments, including:

- Advances in vehicle technology, such as **automated vehicles (AVs)** that operate independently of any input from a human driver, **connected vehicles (CVs)** that communicate with each other or with traffic signals and other infrastructure, and **electric vehicles (EVs)** that use electric motors instead of or in addition to gasoline-powered motors.
- **New mobility services** that use smartphones and other new technologies to connect people with vehicles and rides. These services include **ridehailing companies** like Uber and Lyft that connect passengers with drivers who provide rides in their personal vehicles; **car share** services such as Car2Go, ReachNow, ZipCar, and Turo that allow people to rent a nearby vehicle for short trips, **bike share** systems like BIKETOWN that make fleets of bicycles (or electric bikes or scooters) available for short-term rental; and **microtransit** services that tailor schedules and routes to customers' travel needs and operate vans or small buses.
- **Traveler information and payment** services that help people compare different ways of getting around (such as moovel and Google Maps), get detailed information on their mode of choice (TransitApp, Ride Report, Waze), track and share their trips (Strava, MapMyWalk), and pay for trips (TriMet's Tickets app).

Why is it important to plan for emerging technology?

Technology is already transforming how we travel in the greater Portland region. Uber and Lyft, which began serving several cities in the region in 2014, have spurred some of the most visible changes. In the city of Portland, these services now carry far more people in Portland than taxis do, and provided over 10 million rides in 2017. Across the region, 36

percent of the region’s residents have used ridehailing, mostly for occasional recreational trips or travel to the airport, but there are signs that Uber and Lyft are becoming increasingly critical modes of transportation. Since Metro last asked people about their travel choices in 2014, the percentage of regular car commuters who say they would take Uber, Lyft, or a taxi to work if they didn’t have a car has quintupled, rising from 3 to 16 percent. Meanwhile, the percentage of those who say they would ride transit, carpool, bike, walk or take car share instead of driving fell—particularly for transit, which dropped from 47 to 29 percent.

Other new mobility services are growing as well. Car share services now operate over 1,000 vehicles in the region, and the City of Portland’s bike share system, BIKETOWN, launched in July 2016, and carried over 300,000 trips in its first year. There are also over 100,000 electric vehicles registered in the state, with the majority located in the Portland region. The rapid growth of these new options is only a prelude to the transformative changes that will occur when automated vehicles arrive on our streets.

3.2.4.1 Emerging Technology Strategy (2018)

The Emerging Technology Strategy identifies steps that Metro and our partners can take to harness new developments in transportation technology—including automated, connected and electric vehicles; new mobility services like car share, bike share and ride-hailing; and the increasing amount of data available to both travelers and planners—to create a more equitable and livable greater Portland region and meet the goals in the 2018 Regional Transportation Plan.

We can already see how technology is impacting our communities, sometimes for better and sometimes for worse. Many of us now enjoy access to convenient new options, but communities of color and other historically marginalized communities are not getting their fair share of the benefits of innovation. Many people face barriers to using new mobility services, including lack of access to the internet or a bank account, cultural or linguistic barriers, challenges finding wheelchair accessible vehicles, high costs, and discrimination from drivers or companies. A growing body of research also finds that some new mobility services draw people away from transit, and that ride-hailing increases vehicle miles traveled and congestion. This affects everyone who is struggling to get where they need to go on our increasingly congested streets. Metro and our partners need to engage with emerging technologies to make sure that new services create better options for everyone throughout the region.

Even more importantly, we need to prepare for sweeping changes to come. Within the next five years—and potentially even the next two years—the first generation of AVs will hit our streets, likely deployed by ride-hailing and freight companies. Ride-hailing and other new mobility services will likely become more popular in smaller cities and suburban areas, and could be widely-used for everyday trips in regional centers. Over the longer term, emerging technologies stand to affect every one of our regional goals, both for better and worse, as summarized in Table 3.5.

Table 3.6 How emerging technologies could impact our regional goals

Goal	Promise	Peril
Vibrant communities	We have more space for people instead of vehicles, particularly in regional centers, because vehicles no longer need parking and use less space on the road..	We prioritize moving automated vehicles efficiently over creating space for people. The increased convenience of driving creates less development in regional centers and more in communities outside of the metropolitan area.
Prosperity	New mobility companies bring new jobs to the region, and people are able to spend more time working or at home with families and friends instead of sitting in traffic.	Automation eliminates thousands of jobs, and productivity only increases for people who can do their work from a vehicle.
Choices	Transit becomes more efficient and new mobility services make carpooling the norm.	Driving alone becomes more convenient and new services draw riders away from transit, walking and bicycling.
Reliability	Technology helps to reduce congestion as automated vehicles use roadway space more efficiently, carpooling becomes easier and transit becomes more efficient.	Technoloy increases congestion as driving becomes more convenient, vehicles travel more to move fewer people, there are more conflicts in high-demand areas and delivery vehicles clog local streets.
Safety and security	Autonomous vehicles eliminate crashes due to human error.	More pickups and drop-offs create curbside conflicts and the transportation system is vulnerable to cyberattacks.
Environment	Vehicles become cleaner and more efficient.	Vehicle miles traveled increase, offsetting the benefits of cleaner vehicles, and increased sprawl places pressure on farmland and natural areas.
Health	Cleaner vehicles mean less pollution and better air quality, and bike share provides another active transportation option.	People live more sedentary lifestyles as driving becomes more convenient.
Equity	People who cannot or do not drive have more choices, and new options become more affordable as technology advances.	New services focus on affluent customers, while others face barriers to accessing new technology and services.
Fiscal stewardship	Technology enables more cost-effective pricing, management and operation of the transportation system.	The gas tax and other key sources of transportation revenue dwindle.
Transparency	Collecting transportation data becomes more efficient.	Private companies withhold data from public agencies and resist oversight.

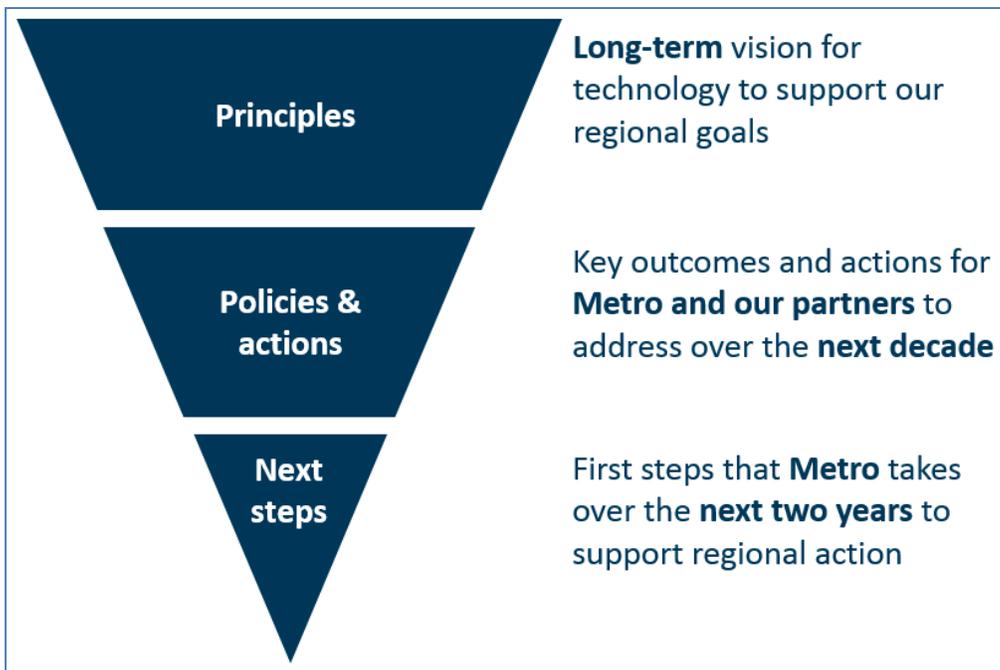
Source: 2018 Emerging Technology Strategy, Metro

The Emerging Technology Strategy policy framework guides Metro and its partners in navigating sweeping and unpredictable change while focusing on the near-term steps we need to take to address the most pressing issues presented by technology. It includes:

Principles that outline a long-term vision for how emerging technologies can support our regional transportation goals. Principles guide Metro and its partners in planning for and working with emerging technology as it continues to evolve, as well as in identifying companies that share common goals when developing partnerships and pilot projects.

Policies and actions focus on the technology-related issues that Metro and its public agency partners have identified as the most pressing to address over the next decade. Policies describe the outcomes that we want to achieve; actions are steps that we can take to achieve those outcomes.

Next steps, which are in the Implementation chapter of the Emerging Technology Strategy and the Chapter 8 of the Regional Transportation Plan, outline the actions that Metro will take in the next two years to help advance the region’s work on emerging technologies.



Emerging Technology Strategy policy framework
Source: Emerging Technology Strategy, Metro

3.2.4.2 Emerging Technology Principles

The principles below articulate a long-term **vision** for how technology should support the goals of the Regional Transportation Plan. These principles, summarized in **Table 3.6**, guide Metro and its partners in planning for and working with emerging technology as it continues to evolve, as well as in identifying companies that share common goals when developing partnerships and pilot projects.

Table 3.7 RTP goals and corresponding emerging technology principles

RTP goal	Emerging technology principle
Vibrant communities	Emerging technology should support our regional land use vision and enable communities to devote more space to places for people.
Prosperity	Workers whose jobs are impacted by automation should be able to find new opportunities, and emerging technology should create more efficient ways to meet the transportation needs of local businesses and workers.
Choices	Emerging technology should improve transit service or provide shared travel options and support transit, bicycling and walking.
Reliability	Emerging technology should help to manage congestion by promoting shared trips, decreasing vehicle miles traveled and minimizing conflicts between modes.
Safety and security	Emerging technology should reduce the risk of crashes for everyone and protect users from data breaches and cyberattacks.
Environment	New mobility services should use vehicles that run on clean or renewable energy.
Equity	New mobility services should be accessible, affordable and available for all and meet the transportation needs of communities of color and historically marginalized communities.
Fiscal stewardship	Emerging technology companies and users should contribute their fair share of the cost of operating, maintaining and building the transportation system, and new technology should make it possible to collect transportation revenues efficiently and equitably. Public agencies should test new ideas and technologies before committing to them in order to get the best return on public investments.
Transparency	Companies and public agencies should collaborate and share data to help make the transportation system better for everyone.

3.2.4.3 Emerging Technology Policies

This section defines emerging technology policies. Implementation actions can be found in the Emerging Technology Strategy.

Emerging Technology Policies	
Policy 1	Make emerging technology accessible, available and affordable to all, and use technology to create more equitable communities.
Policy 2	Use emerging technology to improve transit service, provide shared travel options throughout the region and support transit, bicycling and walking.
Policy 3	Use the best available data to empower travelers to make the travel choices and to plan and manage the transportation system.
Policy 4	Advance the public interest by anticipating, learning from and adapting to new developments in technology.

Emerging Technology Policy 1. Equity

Make emerging technology accessible, available and affordable to all, and use technology to create more equitable communities.

Metro and its partners are responsible for ensuring that the transportation system serves all people, particularly those in the greatest need. New mobility services have the potential to bring more flexible transportation options to historically marginalized communities, but not everyone can access these services. Communities of color face the threat of discrimination from drivers or companies, some older adults and people who speak limited English aren't able to use apps, many low-income people cannot afford costly data plans or lack access to bank accounts and people in wheelchairs often struggle to find accessible shared vehicles. If we can remove these barriers, we can bring better transportation choices to communities of color, night shift workers, people with disabilities, people living in areas that lack frequent transit service and others. We will use new mobility services to create a more just transportation system while helping transportation workers who see their jobs threatened transition to new roles.

What happens if we act	What happens if we don't
<ul style="list-style-type: none">• It is easier for historically marginalized people to get where they need to go, especially when other options aren't available.• Transit, which is the most affordable and accessible way to travel, thrives.• Transportation workers find jobs in the new transportation system.	<ul style="list-style-type: none">• There are more choices for those who can afford them.• Transit dwindles, especially in the communities that need it the most.• Historically marginalized communities are left behind as technology develops.

Emerging Technology Policy 2. Choices

Use emerging technology to improve transit service, provide shared travel options throughout the region and support transit, bicycling and walking.

Emerging technology has already given people in our region new ways to get around, whether by taking car or bike share, hailing a ride, or simply making it easier for people to learn about and pay for public transportation. However, new mobility services are concentrated in communities where it is already easy to take transit, walk and bike, which creates more congestion and pollution by attracting people away from more efficient modes and clogging streets with vehicles looking for passengers. In order to make the most of emerging technology's potential to reduce congestion and pollution, improve safety and support vibrant communities, we need to use technology to help people to connect to transit, share trips with other travelers or leave their cars at home. We will prioritize and invest in the modes that move people most efficiently and continue to improve convenience and safety for transit riders, pedestrians and bicyclists. This is part of a broader effort, reflected throughout the 2018 update to the Regional Transportation Plan, to improve transit service and create safer, better facilities for bicyclists and pedestrians.

What happens if we act	What happens if we don't
<ul style="list-style-type: none"> • New mobility services thrive side-by-side with transit, bicycling, and walking. • We move more people in fewer vehicles. • Emerging technology helps to reduce congestion and emissions • The entire region enjoys new ways to travel. 	<ul style="list-style-type: none"> • New mobility services compete and create conflicts with transit, bicycling, and walking. • Vehicles travel more miles to move fewer people. • Emerging technology increases congestion and emissions. • New options are concentrated in urban areas.

Emerging Technology Policy 3. Information

Use the best data available to empower people to make travel choices and to plan and manage the transportation system.

In today's transportation system, data is as important as infrastructure. Smartphones enable people to instantly book a transit trip or find a new route when they run into traffic, and new mobility companies use real-time data to balance supply and demand. Metro and our partners want high-quality information to be available on all transportation options in the region, and to be presented in a way that allows travelers to seamlessly plan and book trips. We will also develop the data that we need to plan the transportation system – including better data on transit, bicycling and walking as well as on new mobility options – and create systems that allow us to share data among public agencies and better manage and price travel. As we collect better data, we will also develop new policies around how we manage and use data so that we protect personal and competitive information and safeguard this increasingly valuable public resource.

What happens if we act	What happens if we don't
<ul style="list-style-type: none"> • People can easily compare travel options and pick the one that best meets their needs. • We know how emerging technology is changing transportation patterns. • We can manage congestion as it happens. • We get the best value out of public agency data. 	<ul style="list-style-type: none"> • People rely only on the options that they know or that offer flashy apps. • We have limited insight into how our transportation system is changing. • We are slower to respond to collisions and incidents. • Public agencies waste resources on collecting and sharing data.

Emerging Technology Policy 4. Innovation

Advance the public interest by anticipating, learning from and adapting to new developments in technology.

Planning for a changing transportation system begins with changing how we plan. Our current planning process is designed around infrastructure projects designed to last for 50 years and an unchanging set of transportation services. It can take decades to plan and build a project, and once it is built there is little room for change. This time-intensive, risk-averse approach continues to make sense for major transportation investments, but in order to

effectively plan for emerging technology we need to give ourselves opportunities to try new approaches, learn from our experience and adapt so that we can keep up with the pace at which technology is evolving. We will also actively engage new mobility companies alongside large employers, academics and community groups working in the technology arena, to identify opportunities to collaborate and test new ideas and turn our region into a hub for innovation.

What happens if we act	What happens if we don't
<ul style="list-style-type: none"> • We adapt to changes in technology. • We work together with all stakeholders to identify mutually beneficial policies and projects. • We try new ideas and learn from the results. 	<ul style="list-style-type: none"> • We commit to processes, plans and projects that are increasingly out of date. • We confront big changes with limited resources and partnerships. • We sit on our hands because we feel like we don't know enough to act.

3.3 REGIONAL SYSTEM DESIGN AND PLACEMAKING VISION AND POLICIES

The regional transportation system design, placemaking concept and related policies in this section address federal, state and regional transportation planning mandates with roadway design concepts that support regional and local implementation of the 2040 Growth Concept. The transportation system design and placemaking concept establishes design classifications for the regional throughway and arterial system and design guidelines for the physical design of the regional transportation system to foster livable communities throughout the region and encourage walking, bicycling and use of transit.

Sustainable, context sensitive and performance-based design of transportation facilities is critical to achieving regional goals and objectives, including Vision Zero, increased transportation options, efficient and reliable travel for all modes, healthy people and environment, security, addressing climate change, sustainable economic prosperity, racial and income equity, vibrant communities, resiliency and fiscal stewardship.

Land use planning determines where homes, schools, work, shopping, and other activities are located and can profoundly affect the way in which we move around the region and within our communities. The 2040 Growth Concept supports land use that encourages shorter and fewer trips made by driving. Transportation system design should support the goal of reducing vehicle miles traveled by building and operating streets that are sensitive to the adjacent land use context, the roadway's functional classifications and the different needs and abilities of people traveling.

3.3.1 Streets Serve Many Functions

The transportation system design and placemaking concept acknowledges that streets can serve many, sometimes conflicting functions. Land use context informs some of the functions of streets, for example streets in dense urban centers will look and function differently than streets serving freight intermodal facilities, or streets connecting centers. Highways designed for longer trips and higher motor-vehicle speeds will function differently than streets with many destinations and places.

Regional street and trail design guidelines provide tools to help reconcile conflicts for the safety of all modes of travel and achieve adopted policies and desired outcomes. Trade-offs in street design should be driven by a performance based design approach and consistency with adopted policies.

Functions of streets on the regional transportation system

- Pedestrian access and mobility for people walking and people using a mobility device
- Bicycle access and mobility for people riding bicycles
- Transit access and mobility for people accessing and using transit

- Truck freight access and mobility for moving goods, deliveries and e-commerce
- Auto access and mobility for people driving, ridesharing, automated and driverless vehicles/connected vehicles
- Placemaking and public space
- Nature corridors and stormwater management
- Utility corridors
- Stationary space for auto and bicycle parking, transit stops and stations, ride hailing, loading zones, benches/seating
- Physical activity
- Emergency response

3.3.2 Regional Design Classifications

Each of the regional modal networks (Pedestrian, Bicycle, Transit, Freight and Motor Vehicle) has a Network Vision Map which identifies the functional classifications for that mode. Functional classifications are hierarchical and describe the volume and type of trips most suited for that facility.

Regional design classifications are assigned to regional streets with the functional classification of throughway or arterial as shown on the RTP Motor Vehicle Network Map. Design classifications are only applied to streets within the metropolitan planning area.

Design classifications provide an overall approach to design for a facility based on its functional classification and adjacent land use context. Refer to **Table 3.7** Regional Design Classifications for an illustration of the concepts associated with each design classification and **Figure 3.9** Regional Design Classification Map to see which design classifications are assigned to arterials and throughways designated on the regional motor vehicle network.

The regional design classifications serve multiple modes of travel in a manner that supports the specific needs of the 2040 land use components they serve.

- **Freeways and Highways Design Classification:** The Freeways and Highways design classifications are applied to completely grade-separated limited-access facilities and primarily limited-access facilities with some at-grade intersections. This design classification is assigned to facilities with the functional classification of throughway. The essential function is throughput and mobility for motor vehicle travel, travel speeds are higher and they serve as main roadway freight routes. These facilities typically have six through lanes plus auxiliary lanes in some places and parking is prohibited. These facilities cross all types of land use components and buildings are rarely oriented towards the facility. Noise and pollution barriers are necessary. Pedestrian and bicycle travel is supported with parallel completely separated multi-use

paths within the corridor. Providing for connectivity across these facilities for multi-modal travel is essential.

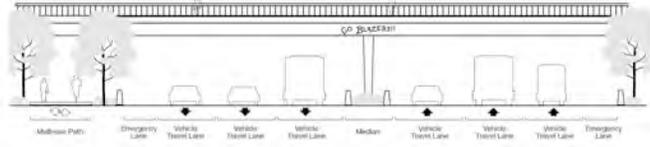
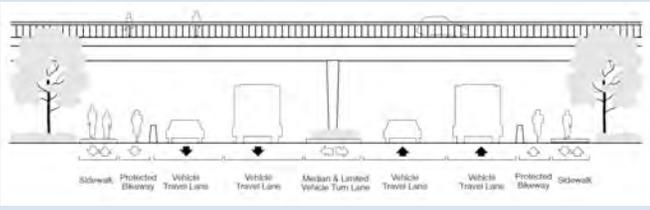
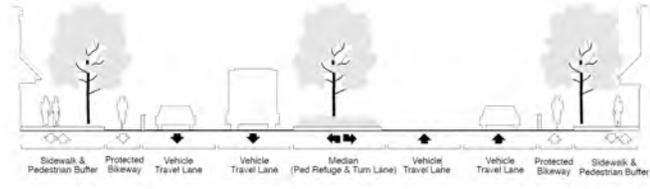
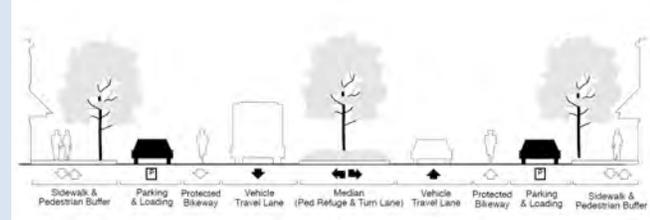
- **Regional and Community Boulevards Design Classification:** The Boulevard design classification is applied to the segments of major and minor arterials in centers of urban activity. The essential function of these streets is transit, bicycle and pedestrian travel and access while balancing motor-vehicle travel and the many other functions of intensely developed areas. Segments that are also designated as freight roadway connectors are designed to serve freight access and movement. These facilities typically have two to four lanes with turn lanes for minor arterials and up to four lanes with turn lanes for major arterials. Medians and access management increase safety for pedestrians and all modes. Speeds are low to moderate. This design classification is applied in the central city, regional centers, station communities, some main streets and town centers. Buildings are oriented towards the street. Connectivity and access are enhanced with medians, roundabouts and protected crossings. Sidewalks are wide and buffered and bikeways are protected.
- **Regional and Community Streets Design Classification:** The Streets design classification is applied to major and minor arterials that serve as commercial corridors and connect regional and town centers, employment, industrial areas and activity centers. The essential function is serving transit and providing pedestrian and bicycle permeability and access while balancing motor-vehicle mobility and other functions. Segments that are also designated as freight roadway connectors are designed to serve freight access and movement. These facilities typically have two to four lanes with turn lanes for minor arterials and up to four lanes for major arterials with turn lanes for major arterials. Medians and access management increase safety for pedestrians and all modes. Speeds are moderate to low. This design classification is applied to 2040 corridors, some main streets, neighborhoods, and some employment and industrial areas. Buildings are usually oriented towards the street, especially at intersections and transit stops. Sidewalks are buffered and bikeways are protected, and if not protected a low stress facility is provided on a parallel facility no less than one block over.
- **Industrial Streets Design Classification:** Industrial Streets design classification is assigned to streets identified as Intermodal Connectors on the Regional Freight System Map and to streets in 2040 industrial areas. The essential function of these streets is freight access to intermodal facilities, while balancing safety and access to transit. Speeds are moderate to low. Intersections have wider turning radii and lane widths are generally wider than the Boulevard or Streets design classifications. Pedestrian and bicycle travel is supported with completely separated parallel multi-use paths, or sidewalks are buffered and bikeways are protected, and if not protected a low stress facility is provided on a parallel facility no less than one block over.

The design concepts promote community livability and reliable travel by balancing all modes of travel and addressing the function and character of adjacent land uses. Linking land use and the physical design of transportation facilities is crucial to achieving state

goals to limit reliance on any one mode of travel and to encourage increased walking, bicycling, carpooling, vanpooling and use of transit.

Table 3.8 summarizes design classifications, typical design elements and motor vehicle functions, illustrating how multimodal design elements can be integrated.

Table 3.8 Design Classifications for Regional Motor Vehicle Network

Trip Type(s)	Design Classification 2040 Land Use(s)	Motor Vehicle Functional Classification	Illustrative Design Concept	Typical number of planned travel lanes ⁹
Interstate Regional	Freeway All	Throughway		6 through lanes (plus auxiliary lanes) with grade separated interchanges
Interstate Regional	Highway All	Throughway		Up to 6 through lanes (plus auxiliary lanes) with turn lanes at grade separated intersections
Regional City	Regional Boulevard <i>Central City</i> <i>Regional Center</i> <i>Town Center</i> <i>Station</i> <i>Community</i> <i>Main Street</i>	Major Arterial		Up to 4 through lanes with turn lanes and median
City	Community Boulevard <i>Central City</i> <i>Regional Center</i> <i>Town Center</i> <i>Station</i> <i>Community</i>	Minor Arterial		2 to 4 through lanes with turn lanes and median

⁹ The number of through lanes may vary based on right-of-way constraints or other factors. Some places in the region may require additional lanes due to a lack of network connectivity. Major and minor arterial streets can either be 2 or 4 lanes with turn lanes as appropriate.

Table 3.8 Design Classifications for Regional Motor Vehicle Network

Trip Type(s)	Design Classification 2040 Land Use(s)	Motor Vehicle Functional Classification	Illustrative Design Concept	Typical number of planned travel lanes ⁹
<i>Main Street</i>				
Regional City	Regional Street Corridor <i>Main Street</i> <i>Industrial area</i> <i>Employment Area</i> <i>Neighborhood</i>	Major Arterial		Up to 4 through lanes with turn lanes and median
City	Community Street Corridor <i>Main Street</i> <i>Industrial Area</i> <i>Employment Area</i> <i>Neighborhood</i>	Minor Arterial		2 to 4 through lanes with turn lanes and median
City	Industrial Street <i>Industrial Area</i> <i>Intermodal Facility</i>	Major Arterial Minor Arterial		Up to 4 through lanes with turn lanes and median

Source: Metro (Conceptual cross sections in the table are illustrative only)

Figure 3.9 Regional Design Classifications Map

The Regional Design Classification Map will be updated after the Public Review of the Draft 2018 Regional Transportation Plan based on the following changes:

- Changes made to the Regional Motor Vehicle Network Map (also known as the Arterial and Throughways Map) will be reflected. Arterials added to the map will be assigned design classifications based on the land use described above.
- Changes made to the Regional Freight Network Map will be reflected. The Industrial Streets Classification will be applied to intermodal connectors and streets in industrial areas.
- Changes proposed by agencies will be considered.

3.3.3 Designs for Safe and Healthy Transportation For All Ages and Abilities

Street and facility designs have a significant impact on the health, safety and economic and environmental sustainability of our communities. Throughways serve interregional and interstate trips and are designed to support safe and reliable motor vehicle travel. Regional arterials serve both regional and local trips and must be designed to support health and sustainability while maintaining mobility and access for all modes. **Table 3.9** identifies the design characteristics of arterials that can promote or hinder health.

Table 3.10 Design Characteristics of Healthy Arterials¹⁰

Health Promoting Design	Unhealthy Design
Neighborhood asset for access and commerce	Physical barrier that divides neighborhoods
Supports neighborhood social & cultural connections	Exhibits neglect and physical decay
Safe travel speeds for all users	Traffic speeds too high to be safe for all users
Comfortable for all users to cross	Difficult to cross because of design and traffic
Link within pedestrian and bicycle networks	Barrier within pedestrian and bicycle networks
Designed to mitigate noise	Source of noise
Designed to mitigate air pollution	Near-roadway air pollution
Accessible to users of all abilities	Inaccessible to users with disabilities
Supports green infrastructure systems	Impervious paving materials, lack of shade
Contributes to revitalization without displacement	Location of residential and business gentrification

Source: *Understanding and Improving Arterial Roads to Support Public Health and Transportation Goals*, American Journal of Public Health. August 2017

Metro’s Livable Streets Handbooks provide design guidance depending on the intended functions of the arterial or throughway, the land uses the facility serves and adopted policy. In the design guidance, consideration is given to various arterial designs, designs for freight, trails, pedestrians, bicyclists and transit and the link between street design and stormwater management. Design decisions, especially trade-offs in situations of limited road right-of-way, should use performance-based design and flexibility in design to achieve desired outcomes.

¹⁰

Figure 3.11 Metro’s Livable Streets Handbooks



Note: graphic to be updated with final covers

Regional design guidance identifies design elements that support achieving regional goals, objectives and policies, and recommend design elements such as:

- Universal, age-friendly designs that comply with the Americans with Disabilities Act and take into account people’s abilities as they transition through various stages of age and ability, particularly older adults, youth and people living with disabilities
- Traffic calming to safe speeds for all modes of travel
- Protected/buffered separation of pedestrians and bicycle riders from motor vehicles, including freight trucks
- Integration of regional trails with the transportation network
- Placemaking designs
- Designs for freight access
- Designs for enhanced transit and accessible bus stops and stations



Well-designed sidewalks, benches, lighting, street trees and other urban design elements encourage more walking and provide for safe travel for people of all ages and abilities.

Where appropriate, traffic calming measures such as narrower travel lanes, compact intersections, landscaped buffers and on-street parking can slow vehicle traffic and reduce crashes involving pedestrians, bicyclists, motorcyclists and motorists. Painted crosswalks, appropriate use of signs and signals and median islands make it easier for pedestrians and bicyclists to cross busy roads.

Curb designs, ramps and crossing signals designed for the hearing- and sight-impaired facilitate safe travel for people of all ages and abilities. Facilities and infrastructure such as

street lighting, wayfinding, benches, bicycle parking, waste baskets, street trees and kiosks make the environment more attractive and create a sense of community and safety that encourages walking, bicycling and the use of transit.

Design elements currently in use in the region and elsewhere that have been shown to increase the level of walking and bicycling and access to transit are described in the Regional Active Transportation Plan as design guidance. The design elements emphasize the need for separation from traffic, especially on streets with higher traffic volumes and/or speeds or on roadways with heavy volumes of freight traffic, for separation of pedestrians and bicyclists on busy regional trails, and the importance of lighting and crossing treatments to increase safety.

3.3.4 Designs for Stormwater Management and Natural, Historic and Cultural Resource Protection

The effect that transportation infrastructure has on the health of the natural environment, particularly urban waterways, is well documented. The combined impervious surfaces of streets, paved trails, parking lots and driveways form the largest impervious surfaces in the urban landscape, accounting for up to 65 percent of the total impervious surface area. A particular challenge is addressing conflicts between transportation facilities and wildlife and riparian corridors, and determining how transportation improvements can be located, designed and constructed with regard for riparian corridor and upland habitat protection plans identified in the Intertwine Regional Conservation Strategy.

Impervious surfaces have been linked to changes in the shape of streams, water quality, water temperature and the biological health of waterways. Regional Green Streets guidelines seek to mitigate these effects through a combination of retrofits to existing streets and designs for new streets and throughways. This is how the RTP and Livable Streets handbooks help ensure protection of salmon and steelhead that were feerally-protected as endangered species in 1999.

As arterial streets and throughways and other types of transportation infrastructure cut across the landscape, they form barriers to wildlife movement, disrupting migration patterns and population dynamics. These disruptions can



Green retrofits can help intercept rainwater thereby minimizing the negative impacts to streams and other waterways.

be minimized through engineered solutions, such as wildlife-crossing devices, structures and through incorporating wildlife corridor acquisition/restoration needs into transportation project development or by avoiding the areas all together.

Infrastructure planning and design should first seek to avoid fish and wildlife habitat conservation areas. If that is not practicable, opportunities to mitigate the effects of transportation infrastructure and services through the application of “green” design treatments should be identified and implemented. For example, street trees, vegetated swales and other green street treatments can intercept rainwater and convey stormwater in the public right-of-way adjacent to the region’s throughways and arterial streets and pedestrian and bicycle projects can include improved crossings for wildlife. Refer to Metro’s handbooks “Green Streets: Innovative Solutions for Stormwater and Stream Crossings” and “Wildlife Crossings: Providing safe passage for urban wildlife” for more information on these designs.

This section will be expanded to described more about potential mitigation strategies for protecting historic and cultural resources, water and habitat.

3.4 REGIONAL NETWORK VISIONS, CONCEPTS AND POLICIES

This section establishes a network vision, concept and supporting policies for each component of the regional transportation system. The network vision, concepts and policies represent a complete urban transportation system that meets the plan goals and supports local aspirations for growth.

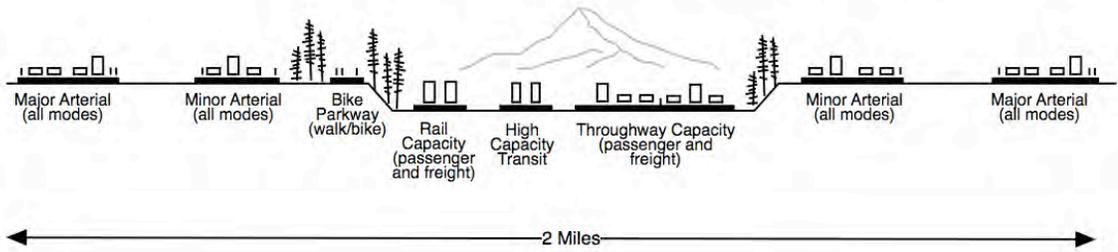
The network visions, concepts and policies provide define a seamless and well-connected regional system of regional throughways and arterial streets, freight networks, transit networks and services and bicycle and pedestrian facilities. The network policies emphasize safety, access, mobility and reliability for people and goods and recognize the community-building and placemaking role of transportation. The network visions, concepts and supporting policies will guide the development, design and management of different components of the regional transportation system.

3.4.1 Regional Mobility Corridor Concept

The regional mobility corridor concept integrates throughways, high capacity transit, arterial streets, frequent bus routes, freight/passenger rail and bicycle parkways into subareas of the region that work together to provide for regional, statewide and interstate travel. The function of this system 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. These transportation corridors also have a significant influence on the development and function of the land uses they serve and are defined by the major centers set forth in the Region 2040 Growth Concept. The regional mobility corridor concept calls for consideration of multiple facilities, modes and land use when identifying needs and most effective mix of land use and transportation solutions to improve mobility within a specific corridor area. The concept of a regional mobility corridor is shown in **Figure 3.12**.

Since the 1980s, regional mobility corridors have had throughway travel supplemented by high capacity transit service that provides an important passenger alternative. Parallel arterial streets, heavy rail, bus service, bicycle parkways and pedestrian/bicycle connections to transit also provide additional capacity in the regional mobility corridors. The full array of regional mobility corridor facilities should be considered in conjunction with the parallel throughways for system evaluation and monitoring, system and demand management and phasing of physical investments in the individual facilities. Bicycle and pedestrian travel and access to transit are also important as we plan and invest in regional throughways and arterial streets. New throughway and arterial facilities, such as freeway interchanges or widened arterial streets, should be designed and constructed in such a manner as to support bicycling, walking and access to transit.

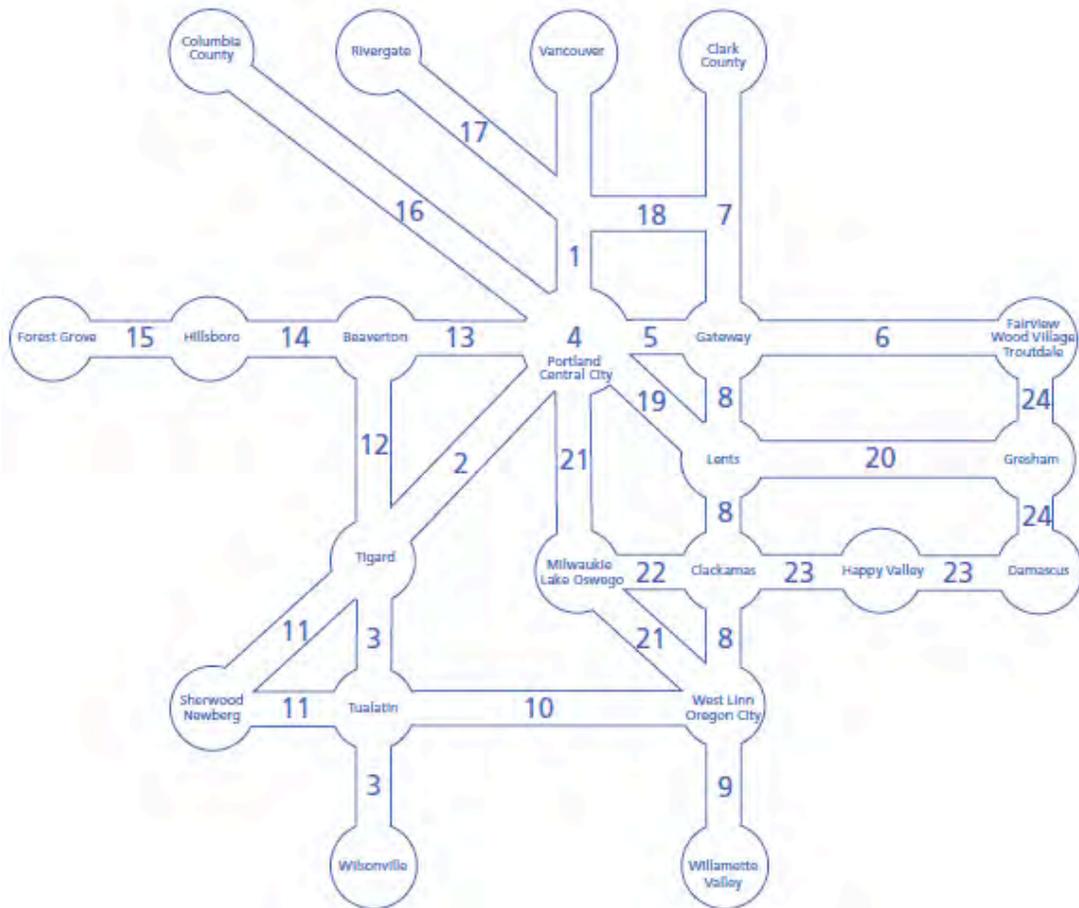
Figure 3.12 Regional Mobility Corridor Concept



Note: Idealized concept for illustrative purposes showing recommended range of system analysis for the evaluation, monitoring, management and phasing of investments to throughways, arterial streets and transit service in the broader corridor. The illustration is modeled after the Banfield corridor that links the Portland central city to the Gateway regional center.

Figure 3.13 shows the general location of mobility corridors in the region.

Figure 3.13 Mobility Corridors in the Portland Metropolitan Region



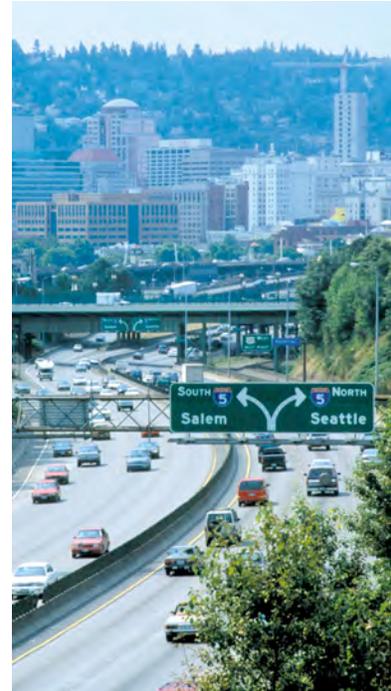
The Mobility Corridor Strategies provided in the Appendix provides a summary of the 24 corridors, describing facilities, functions, land uses, and documenting transportation needs and strategies for addressing them. These strategies will be updated as part of the Regional Mobility Policy update described in Chapter 8.

3.5 REGIONAL MOTOR VEHICLE NETWORK VISION AND POLICIES

3.5.1 Regional Motor Vehicle Network Vision

Though our region has changed dramatically over the past century, the shape of the major road network serving our region has not. Most of our regional streets were once farm-to-market roads, established along Donation Land Claim boundaries at half-mile or mile spacing. The region's throughway system evolved from the mid-1930s, when the first highway was built from Portland to Milwaukie, to the completion of I-205 in the early 1980s. Most of the throughway system was built along the same Donation Land Claim grid that shapes the regional street network, with most throughways following older farm-to-market routes or replacing major streets.

This inherited network design has proven to be an adequate match for accommodating the changing travel demands of our growing region. The Regional Motor Vehicle Network Concept seeks to apply this proven network design to developing and undeveloped areas in the region, while seeking opportunities to bring existing urban areas closer to this ideal when possible.

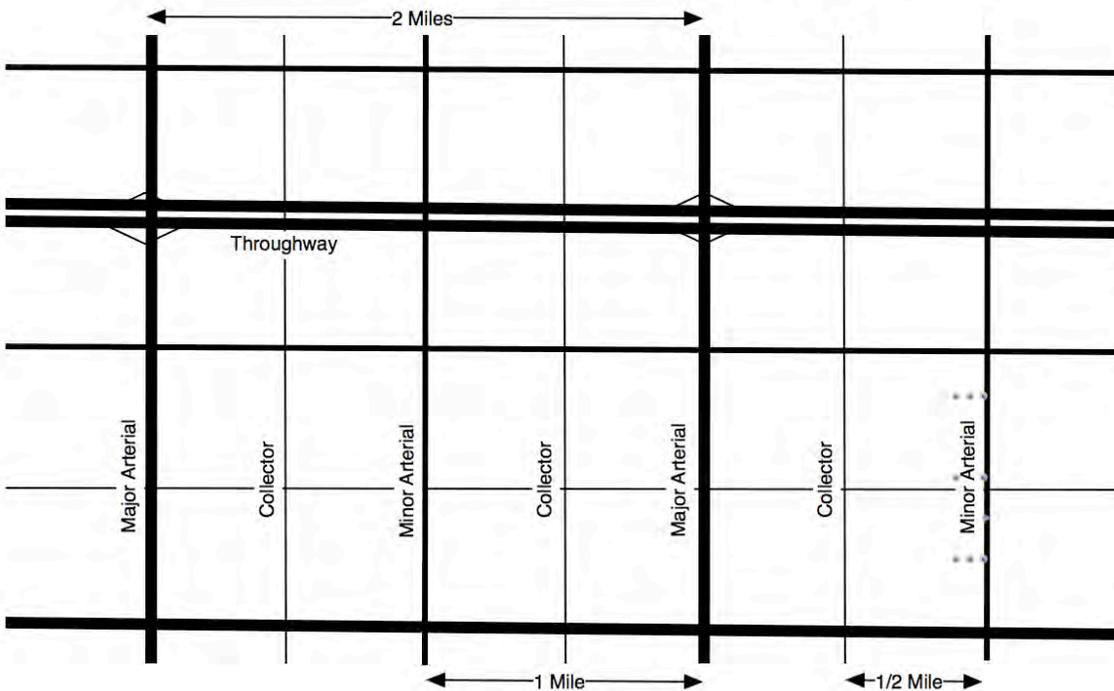


Throughways allow people and goods to connect to major destinations across the region and beyond.

3.5.2 Regional Motor Vehicle Network Concept

The Regional Motor Vehicle Network Concept illustrates policies for developing a complete and well-connected roadway network that is safe and reliable, provides adequate capacity and supports all modes of travel.

Figure 3.14 Regional Motor Vehicle Network Concept



Note: Conceptual network, illustrating multimodal transportation corridors and showing ideal spacing of arterial streets. Most of the region's travel occurs off the throughway network, on a network of multimodal arterial streets. The RTP policy places an emphasis on ensuring that arterial networks are fully developed as the region grows, providing both local circulation and preserving throughway capacity for regional and statewide travel.

3.5.3 Regional Motor Vehicle Network Policies

Rather than solely relying on levels of congestion to direct how and where to address bottlenecks and other motor vehicle capacity deficiencies, the concept calls for implementing a well-connected network design that is tailored to fit local geography, respect existing communities and future development and protect the natural environment. Increased connectivity improves travel reliability through reducing bottlenecks and congestion hotspots and increasing travel options.

Regional Motor Vehicle policies

- Policy 1** Preserve and maintain the region’s motor vehicle network system in a manner that improves safety, security and resiliency while minimizing life cycle cost and impact on the environment.
- Policy 2** Use the Congestion Management Process, Regional Mobility Policy, safety and bike and pedestrian network completion data to identify motor vehicle network deficiencies.
- Policy 3** Preserve capacity on the region’s throughway network for longer, regional, statewide and interstate travel.
- Policy 4** Actively manage and optimize arterials according to their planned functions to improve reliability and safety, and maintain mobility and accessibility for all modes of travel.
- Policy 5** Strategically expand the region’s throughway network up to six travel lanes plus auxiliary lanes between interchanges to maintain mobility and accessibility and improve reliability for regional, statewide and interstate travel.
- Policy 6** In combination with increased transit service, consider use of value pricing to manage congestion and raise revenue when one or more lanes are being added to throughways.
- Policy 7** Complete a well-connected network of arterial streets ideally spaced at approximately 1-mile apart and planned for up to four travel lanes to maintain transit and freight mobility and accessibility and prioritize safe pedestrian, bicycle and transit access for all ages and abilities using Complete Street design approaches.
- Policy 8** Complete a well-connected network of collector and local streets that provide for local circulation and direct vehicle, bicycle and pedestrian access to adjacent land uses and to transit for all ages and abilities.
- Policy 9** Minimize environmental impacts of the motor vehicle network using Green Street infrastructure design and other approaches.
- Policy 10** Address safety needs on the motor vehicle network through coordinated implementation of cost-effective crash reduction engineering measures, education, and enforcement.
- Policy 11** Incorporate complete street and green street designs that prioritize safe and convenient pedestrian and bicycle access for regional and local roadways.
- Policy 12** Prior to adding new motor vehicle capacity beyond the planned system of motor vehicle through lanes, demonstrate that system and demand management strategies, including access management, transit and freight priority and value pricing, transit service and multimodal connectivity improvements cannot adequately address arterial or throughway deficiencies and bottlenecks.

Network connectivity

A well-connected network of complete streets is critical to achieving the 2040 Growth Concept vision. In general, the roadway network should be designed to provide for trips through or across the region on throughways, shorter trips through portions of the region on arterial streets and the shortest trips on collector and local streets.

This approach results in a street hierarchy of:

- throughways (for example, limited-access facilities such as I-84, US 26, I-5, I-205 and I-405)
- arterial streets (for example, Cornell Road in Washington County, 82nd Avenue in the City of Portland and Sunnyside Road in Clackamas County)
- collector streets
- local streets

The traditional street classifications for throughways, arterial streets and other streets are a good starting point for distributing traffic in communities to avoid bottlenecks on overburdened routes or avoid the need to build overly wide streets as a community grows.

Throughways serve only as mobility routes, with little or no property access, and an emphasis on connecting major destinations across the region. Arterial streets provide both mobility, moving traffic, goods, and people within the region, and access to property along the street. The degree to which one of these regional street purposes predominates over the other is determined by the functional classification.

The RTP presumes that building a regional motor vehicle network to accommodate all motor vehicle traffic during peak travel periods is not practical nor would it be desirable considering potential environment and community impacts.

By developing a well-connected network the region can spread traffic across the entire network, reducing the need to overburden a few facilities. This will help reduce bottlenecks and congestion hotspots, decreasing the need to widen roads and intersections beyond their typical design. Connectivity also supports transit, biking and walking by making trip distances shorter and more direct and convenient. Improved travel reliability is a key overall outcome of from all of these connectivity-oriented strategies.

Complete streets is a transportation policy and design approach for roadways that are planned, 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. Complete Streets allow for safe travel by those walking, bicycling, driving automobiles, riding public transportation, or delivering goods.



Typical spacing and planned capacity for arterial streets

As a result, the regional motor vehicle network concept calls for one-mile spacing of major arterial streets, with minor arterial streets or collector streets at half-mile spacing, recognizing that existing development, streams and other natural features may limit the provision of these connections. Major and minor arterial streets can be either 2 or 4 lanes with turn lanes as appropriate. Streets with 4 or more lanes should include medians, where possible, with appropriate median openings for turning movements and turn lanes. Access management strategies should be used on arterial streets and all streets with 4 or more lanes.

Shown in **Figure 3.14**, the illustrative arterial street network is complemented by a well-connected network of collector and local streets. This network of regional and local streets is multi-modal in design, serving automobiles, motorcycles, trucks, transit, bicycles and pedestrians. The regional arterial street design with median reflects an accepted design that can support safe travel by all of these modes, accommodating urban levels of traffic, while also providing for bicycle and pedestrian travel and safe crossings at major intersections.

Traffic speeds, access and level of street connectivity vary depending on the function of the street. The design of transportation facilities should consider the facility's traffic function, all modes of travel, and community development goals. As identified in the Regional Active Transportation Plan and Metro's livable street design guidelines, traffic speeds, traffic volumes and the volume of heavy trucks should be considered in the design of pedestrian and bicycle facilities on streets on the regional network.

Research and experience have shown that there are optimal street designs for various types of roadways. Street design, combined with connectivity help reduce congested hot spots and improve reliability. Local streets and collectors are planned to consist of 2-lanes with turn lanes where needed, major arterials are planned to consist of up to 4-lanes with medians and with turn lanes and access management strategies, throughways are planned to consist of 6-lanes plus auxiliary lanes with grade separated interchanges or intersections.

Therefore, before adding additional through lanes beyond the planned system, plans and studies must demonstrate that the additional lanes beyond the planned system do not compromise the function of the roadway for all modes and that the planned system of through lanes, transit service, bike, pedestrian and other parallel arterial, operational, system and demand management solutions do not adequately address transportation needs first, prior to considering widening beyond the planned system to address capacity concerns.

Throughways

Throughways generally span several jurisdictions and often are of statewide importance linking the Metro area with neighboring cities, other parts of the state, other states and

Canada. Throughways are planned to consist of six through lanes, plus auxiliary lanes, with grade-separated interchanges or intersections, and serve as the workhorse for regional, statewide and interstate travel. Additional lanes may be required in some places based on the importance of a facility to regional and state economic performance, excessive demand, and limitations or constraints that prevent creation of a well-connected street network due to topography, existing neighborhoods, or natural resource areas. Chapter 5 explores where such conditions may exist and defines the parameters for future corridor refinement planning work specific to each regional mobility corridor.

Throughways currently carry between 50,000 to 100,000 vehicles per day, providing for high-speed travel on longer motor vehicle trips and serving as the primary freight routes, with an emphasis on mobility. Throughways help serve the need to move both trucks and autos through the region. Throughways connect major activity centers within the region, including the central city, regional centers, industrial areas and intermodal facilities.

The Throughway design classification implements the Principal Arterial vehicular functional classification. There are three types of Throughways as described in **Table 2.6:** Freeways - which are limited-access and completely grade separated, Highways and Parkways, which include a mix of separate and at-grade access points. Throughway interchanges should be spaced no less than two miles apart.



Throughways accommodate longer-distance regional and state-wide travel and provide important access to the region's major activity centers, such as downtown Portland, and freight access to industrial areas and freight intermodal facilities.

Arterial streets

Arterial streets are intended to provide general mobility for travel within the region and provide important connections to the throughway network. Arterial streets connect major commercial, residential, industrial and institutional centers with each other and link these areas to the throughway network. Arterial streets are usually spaced about one mile apart and are designed to accommodate motor vehicle, truck, bicycle, pedestrian and transit travel.

Arterial streets usually carry between 10,000 and 40,000 vehicles per day and often allow higher speeds than collector and local streets. Major arterial streets accommodate longer-distance through trips and serve more of a regional traffic function. Minor arterial streets serve shorter trips that are localized within a community. As a result, major arterial streets usually carry more traffic than minor arterial streets. The arterial functional classification is implemented through the Boulevard and Street design classifications described in **Table 3.8** and in the glossary.



Major arterial streets accommodate longer-distance through trips, while minor arterials serve shorter trips within a community.

Arterial Safety

Safety is a primary concern on the regional arterial system, on which approximately 60% of the region's fatal and severe injury crashes occur. For this reason, much of the focus for achieving the region's Vision Zero target will fall upon arterial streets. More attention to designs and operational strategies that have been demonstrated to improve the safety of the arterial system could reduce the number of people killed and injured, using national best practices as a guide. Efforts to substantively improve transportation safety in the region must give arterial roadways high priority, with a focus on the region's high injury corridors, and may include:

- proven designs and strategies such as medians, speed management, access management, improved pedestrian crossings and street lighting, replacing intersections with roundabouts, reducing speeds to levels which are safe for pedestrians and road diets;
- enforcement actions targeting high-risk behaviors, such as speeding, aggressive driving, driving under the influence, red-light running, and failure-to-yield at bike and pedestrian crossings; and
- education initiatives intended to promote safer behavior among all users of the transportation system.

The safety targets of the RTP will not be met without a concerted effort to make the region's arterial roadways substantially safer. The development of an objective metric to measure safety on the region's arterials, regardless of jurisdiction, should be developed to support prioritization of corridor safety efforts.

Local and collector street connectivity

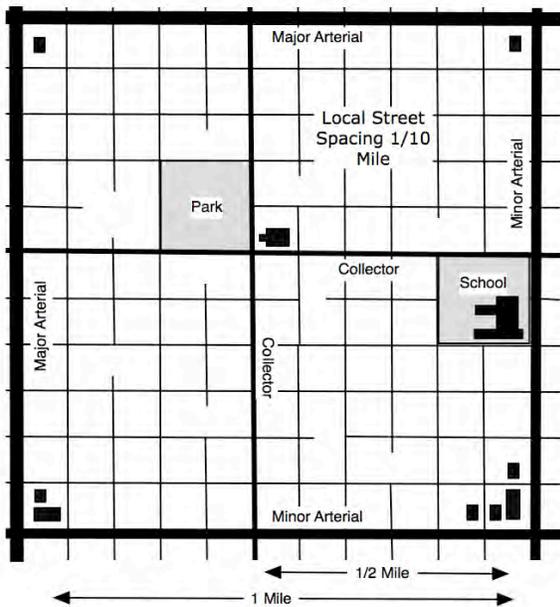
Collector and local streets are general access facilities that provide for community and neighborhood circulation. They are not usually part of the regional transportation system except when located within designated 2040 areas as described in Section 2.4 (or when

they are part of the Regional Bicycle or Pedestrian Network), they play an important supporting role to the design and optimization of the regional transportation system. When local travel is restricted by a lack of connecting routes, local trips are forced onto the arterial and/or throughway networks, in some cases causing congestion on the regional system.

Local jurisdictions are responsible for defining the network of local and collector streets within the mile-spacing grid of arterial streets. The Regional Transportation Functional Plan requires local street spacing of no more than 530 feet in new residential and mixed-use areas, and cul-de-sacs are limited to 200 feet in length to distribute vehicle movements and provide direct bicycle and pedestrian routes. More frequent bike and pedestrian connections are required where collector and local streets cannot be constructed due to existing development or other topographic or environmental constraints.

A goal of the requirements is to encourage local traffic to use local and collector streets to minimize local traffic on regional arterial streets. Local street connectivity also benefits emergency response. Designs should retain the neighborhood character and livability along these local routes.

Figure 3.15 Collector and Local Streets Network Concept



Note: Idealized concept for illustrative purposes showing desired spacing in residential and mixed-use areas to serve local circulation, walking and bicycling. The illustration is modeled after neighborhoods in Southeast Portland.

Shown in **Figure 3.15**, the collector and local street network concept provides for bicycle and pedestrian travel and provides for direct access from local street networks to community destinations and transit on regional arterial streets.

Collector Streets

Collector streets provide both access and circulation. As such, collectors tend to carry fewer motor vehicles at lower travel speeds than arterial streets. Collectors may serve as freight access routes, providing connections from industrial or commercial areas to the arterial network. Collector streets serve neighborhood traffic. Collectors provide local circulation alternatives to arterial streets. Collectors provide both circulation and access within residential and commercial areas, helping to disperse traffic that might otherwise use the arterial network for local travel.

Collectors may also serve as local bike, pedestrian and freight access routes, providing connections to the arterial and transit network. Collectors usually carry between 1,000 and 10,000 vehicles per day, with volumes varying by jurisdiction. Collector streets are ideally spaced at half-mile intervals, or midway between arterial streets. Auto speeds and volumes on collector streets are moderate.

Local Streets

Local streets primarily provide direct access to adjacent land uses, and usually carry fewer than 1,000 vehicles per day, with volumes varying by jurisdiction. Vehicle speeds on local streets are relatively low, which makes them good candidates for bicyclists and walkers traveling within and between centers.

While local streets are not intended to serve through traffic, the local street network serves an important role for supporting bicycle and pedestrian travel. As a result, regional local street connectivity policies require communities to develop a connected network of local streets to increase access to designated centers and the regional transit network by non-motorized travelers.



Local streets have lower vehicle speeds and less vehicle traffic, serving an important role of supporting bicycle and pedestrian travel in the region.

3.5.3 Interim Regional Mobility Policy

The interim mobility policy shown in **Table 3.16** describes operational conditions that are used to evaluate the quality of service of the auto network, using the ratio of traffic volume to planned capacity (referred to as the volume/capacity ratio) of a given roadway. The measures are used to diagnose the extent of auto congestion during different times of the day in order to identify deficient roadway facilities and services in the plan. The interim regional mobility policy in **Table 3.16** shows the minimum performance level desired for auto transportation facilities and services within the region. Originally adopted in 2000 and amended into the Oregon Highway Plan in 2002, the interim regional mobility policy reflects a level of performance in the region that the Oregon Transportation Commission

(OTC) deemed acceptable at the time of its adoption, but is also recognized as an incremental step toward a more comprehensive set of measures that consider system performance, as well as financial, environmental and community impacts.

The OTC has indicated a desire for Metro to advance beyond the traditional mobility performance measure used to guide investment decisions. Metro, ODOT and other regional partners will continue to work together to update the current regional mobility policy to better align with RTP outcomes.

This evaluation helps the region develop strategies to address roadway congestion in a more strategic manner, given limited transportation funding and potential environmental and community impacts. The system analysis described in Chapter 4 finds that the region cannot achieve the mobility policy listed in **Table 3.16** within current funding levels or with the mix of investments included in the analysis.

Table 3.16 Interim Regional Mobility Policy

Deficiency Thresholds and Operating Standards

Location	Standard Mid-Day One-Hour Peak ^A	Standard PM 2-Hour Peak ^A	
		1st Hour	2nd Hour
Central City Regional Centers Town Centers Main Streets Station Communities	.99	1.1	.99
Corridors Industrial Areas Intermodal Facilities Employment Areas Inner Neighborhoods Outer Neighborhoods	.90	.99	.99
I-84 (from I-5 to I-205)	.99	1.1	.99
I-5 North (from Marquam Bridge to Interstate Bridge)	.99	1.1	.99
OR 99E (from Lincoln Street to OR 224 interchange)	.99	1.1	.99
US 26 (from I-405 to Sylvan interchange)	.99	1.1	.99
I-405 ^B (I-5 South to I-5 North)	.99	1.1	.99
Other Principal Arterial Routes I-205 ^B I-84 (east of I-205) I-5 (Marquam Bridge to Wilsonville) ^B OR 217 US 26 (west of Sylvan) US 30 OR 8 (Murray Boulevard to Brookwood Avenue) ^B OR 212 OR 224 OR 47 OR 213	.90	.99	.99

- A. The demand-to-capacity ratios in the table are for the highest two consecutive hours of weekday traffic volumes. The mid-day peak hour is the highest 60-minute period between the hours of 9 a.m. and 3 p.m. The 2nd hour is defined as the single 60-minute period, either before or after the peak 60-minute period, whichever is highest.
- B. A corridor refinement plan is required in Chapter 8 of the RTP, and will include a recommended mobility policy for each corridor.

3.5.4 Congestion Management Process

The RTP calls for implementing system and demand management strategies prior to building new motor vehicle capacity, consistent with the Federal Congestion Management Process (CMP), Oregon Transportation Plan policies and as described in the Regional Transportation Functional Plan (RTFP) Section 3.08.220. In some parts of the greater Portland region, the transportation system is generally complete, while in other parts of the region, especially those where new development is planned, significant amounts of infrastructure will be added. In both contexts, management strategies have great value. Where the system is already built out, such strategies may be the only ways to manage congestion and achieve other objectives. Where growth is occurring, system and demand management strategies can be integrated before and during development to efficiently balance capacity with demand. New technologies are reducing the cost of demand management and new possibilities are emerging with autonomous and connected vehicles.

3.5.5 Regional Motor Vehicle Network Classifications and Map

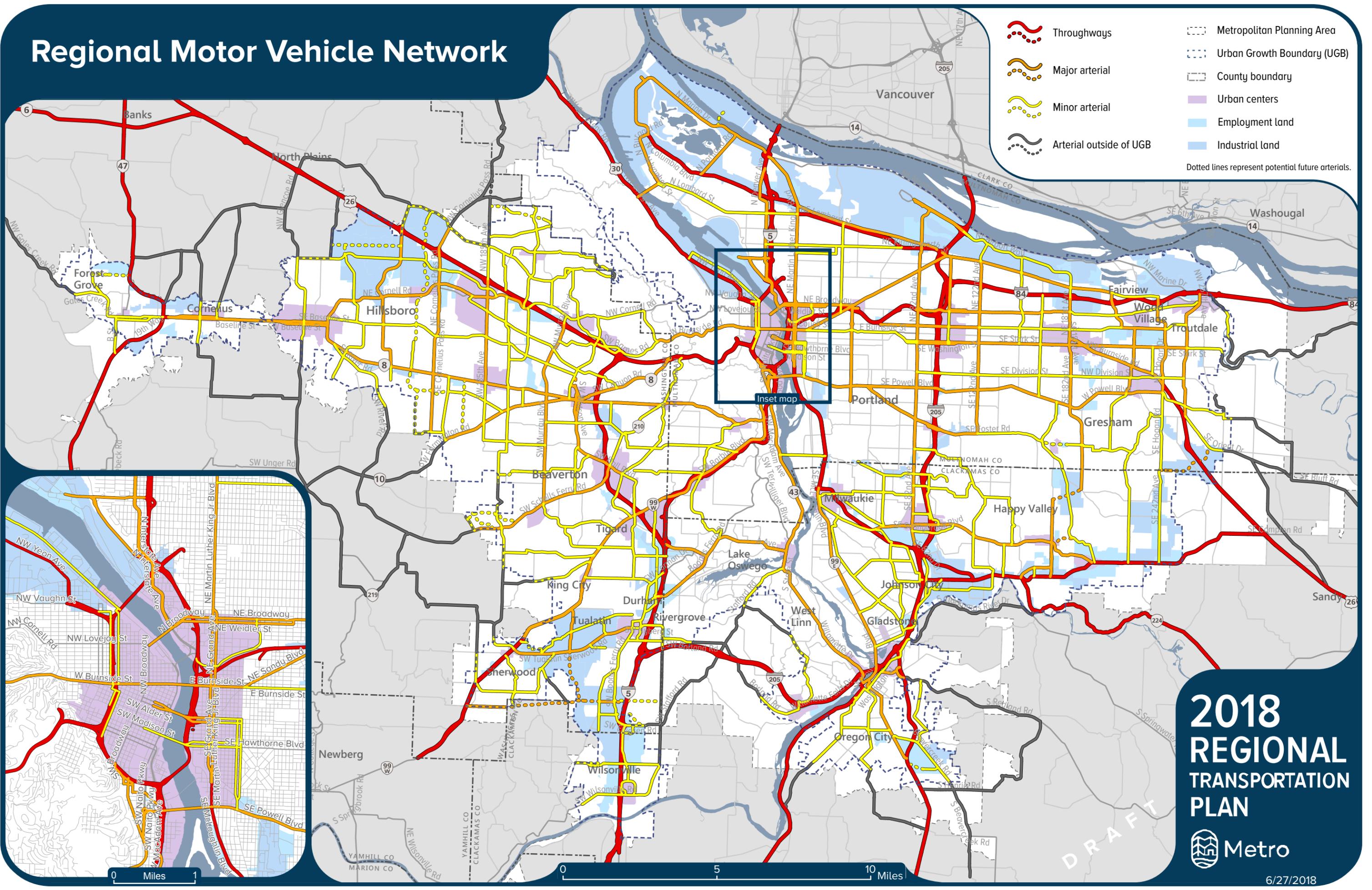
The Regional Regional Motor Vehicle Network is shown in **Figure 3.17**. (See <http://gis.oregonmetro.gov/RTP/> for zoomable version of map.

(See <http://gis.oregonmetro.gov/RTP/> for zoomable version of map.)

Figure 3.17 Motor Vehicle Network Map

Regional Motor Vehicle Network

-  Throughways
 -  Major arterial
 -  Minor arterial
 -  Arterial outside of UGB
 -  Metropolitan Planning Area
 -  Urban Growth Boundary (UGB)
 -  County boundary
 -  Urban centers
 -  Employment land
 -  Industrial land
- Dotted lines represent potential future arterials.



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3.6 REGIONAL TRANSIT NETWORK VISION AND POLICIES

3.6.1 Regional Transit Network Vision

With continued regional growth, come challenges including more congestion, higher housing prices, and constrained access to employment and daily needs. Residents, elected officials, and community organizations view increased transit service as a critical part of the overall solution to these challenges. To achieve the regional vision in the 2040 Growth Concept and Climate Smart Strategy, the Regional Transit Vision is to make transit more convenient, accessible, affordable and frequent for everyone.

What do frequent, convenient, accessible and affordable mean?

Make transit more frequent by aligning frequency and type of transit service to meet existing and projected demand in support of local and regional land use and transportation visions.

Frequent transit service is defined as service that operates at a maximum of 15 minutes intervals, but this isn't the only type of service. Regional and local transit service provides basic service and ensures that most the region's population has transit service available to them; service span and frequencies vary based on the level of demand for the service. Because of limited resources, it is important to ensure that service meets demand. Frequency therefore means aligning the frequency and type of service to meet existing and/or projected demand for an area.

Make transit more convenient and competitive with driving by improving transit speed and reliability through priority treatments and other strategies. Improve transit rider experience by ensuring seamless connections between various transit providers, including transfers, information, and payment. Additionally, cities and counties who own the roads used by bus transit could partner with the transit agencies to implement transit priorities treatments.

In order for people to choose transit over driving, transit must be convenient and reliable. A transit trip needs to get people to their destination at the projected time, and it must be easy to use. Perhaps most importantly, it needs to be a viable option in regards to travel times. This can be accompanied with strategies that prioritize transit (e.g. signal priority and bus lanes) as well as adopting technology that make transit more predictable and user-friendly (e.g. electronic fare and real-time monitoring systems).

Make transit more accessible by ensuring safe and direct biking and walking routes and crossings that connect to stops, as well as improve accessibility for seniors and persons with disabilities to ensure transit is accessible for everyone. Accessibility could also include park and ride facilities and drop off/pick up areas. Expand the system to improve access to jobs and essential destinations and daily needs.

Accessibility refers to two separate but related aspects of transit. One is to ensure that transit is physically accessible to everyone, regardless of age or ability. All transit users must access transit via biking or walking, even if stops are mere feet away. Complete sidewalks and bike paths improve safety and enhance the experience of using transit and the accessible stations are essential to making transit work for everyone. The first/last mile connection is also an important part of accessibility, as it often represents the best opportunity for people living in less developed areas, rural towns or outlying areas to access our transit system.

The second component of accessibility is to ensure that schools, particularly high schools and colleges, community places, such as grocery stores and medical services, and jobs are accessible by transit. As the region grows, it's crucial to continue to expand community and regional transit service in order to improve access to these daily needs, and encourage employers to locate on existing transit routes.

Making transit affordable is the cornerstone of the other components of our vision. Frequency, convenience, and accessibility are meaningless if transit is not affordable. Additionally, affordability ensures that the transit system is equitable for low income populations, communities of color and those who rely on transit services rather than private automobiles to meet their daily transportation needs.

3.6.2 Regional Transit Network Concept

The regional street system has carried public transit for more than a century, beginning with the streetcars of the late 1800s and evolving into a combination of vans, buses, streetcars and light rail trains today. The Tri-County Metropolitan Transportation District of Oregon (TriMet) is the primary public transportation provider for the greater Portland region. The South Metro Area Regional Transit (SMART) district in Wilsonville also provides regional transit service, connecting Wilsonville to Portland and communities in Washington and Clackamas counties.

Just outside of the greater Portland region, Sandy Area Metro (SAM) and Canby Area Transit (CAT) provide transit service for Sandy and Canby. Bus service in other surrounding areas, all with connections to TriMet and SMART, is also provided by C-TRAN (Clark County, WA), Ride Connection, South Clackamas Transit District (SCTD), Cherriots (Salem, OR), Tillamook County Transportation District (Tillamook, OR), and Yamhill County Transit Area (Yamhill County, OR).

Transit is a partner in supporting the region's 2040 Growth Concept, which calls for focusing future growth in regional and town centers, station communities and 2040 corridors. A regional transit network, coupled with transit-supportive development patterns and policies that support taking transit, biking, and walking, will be necessary to help the region:

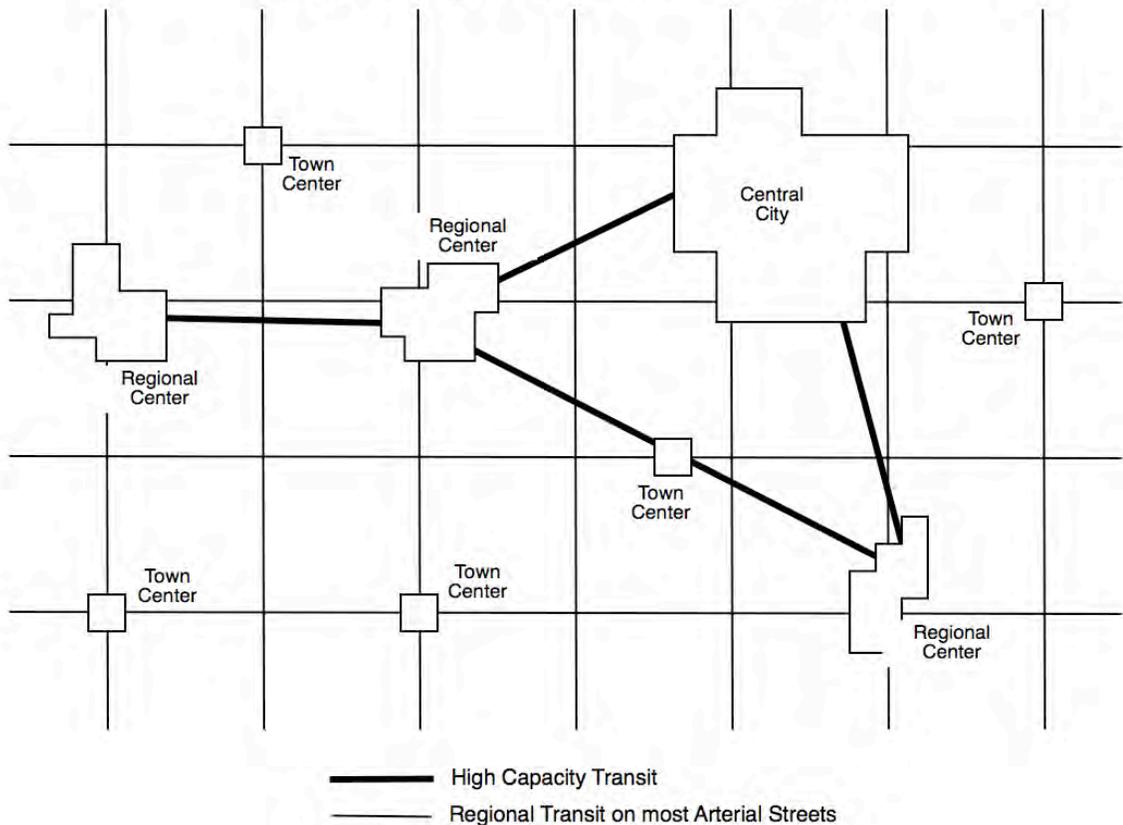
- be less dependent on automobiles

- reduce overall transportation and housing costs
- lead healthier lives
- reduce greenhouse gas emissions

As part of the 2040 Growth Concept, transit is critical to connecting centers.

Figure 3.18 shows how the regional transit system concept would connect the 2040 centers.

Figure 3.18 Regional Transit Network Concept



The 2040 Growth Concept sets forth a vision for connecting the central city to regional centers like Gresham, Clackamas and Hillsboro with high capacity transit. The RTP expands this vision to include a complete network of regional transit along most arterial streets to better serve existing and growing communities. Existing land use mixes and future transit-oriented development potential should be considered and incorporated into service and station location decisions.

In order to leverage transit investments, it is important to ensure land uses are transit-supportive and support local and regional land use and transportation plans and visions to leverage and protect transit investments.

Adjacent land uses, block size, street connectivity, and parking management affect the success of transit service. Policies and investments that make transit work best can be found in **Table 19**.

Table 3.19 Effects of Land Use Strategies on Transit Service

Characteristic	Works	Doesn't Work
Density	High	Low
Street layout	Small blocks Grid system	Long, winding streets Cul-de-sacs, dead-end
Mix of uses	Mixed use (e.g., commercial, residential, and office uses)	Single use (e.g., all residential, all industrial)
Pedestrian and bicycle environment	Wide sidewalks Slow moving traffic Street elements (e.g., benches, street trees, pedestrian-scale lighting) Well-marked intersections with signalized crossings Bicycle parking	Narrow or no sidewalks Fast moving traffic Poor lighting No intersection markings and long pedestrian wait times
Site design	Buildings front the street and entrances	Buildings set back from the street and surrounded by surface parking
Parking	Limited Fee-based parking	Abundant Free

Source: TriMet

Transit-supportive development patterns include:

- A compact urban form that places destinations near transit.
- A mix of uses, and a balance of jobs and housing, that creates a place where activity occurs at least 18 hours a day.
- Locating a mix of services near transit, including grocery stores and medical clinics.
- Locating affordable housing options, particularly for older adults, seniors and people with disabilities, near frequent transit
- Well-designed streets and buildings that encourage pedestrian travel.
- Streets that can accommodate 40-foot buses.
- Safe and efficient multi-modal interactions at transit stops and stations.
- Safe, direct and convenient pedestrian and bicycle access, within communities and to transit stops and stations.
- Street connectivity with good pedestrian and bike connections to extend the effective coverage of bus and rail service.
- Managed on-street and off-street parking.

Areas with low population and/or employment densities, abundant free parking, and with difficult access to transit stops generate fewer riders than areas with transit-supportive development. When fewer riders are generated, it costs more per ride to provide transit service than it does in transit-supportive areas. Ridership productivity is a key criterion in assessing the benefits of service improvements and new transit investments.

3.6.3 Regional Transit Network Map and Functional Classifications

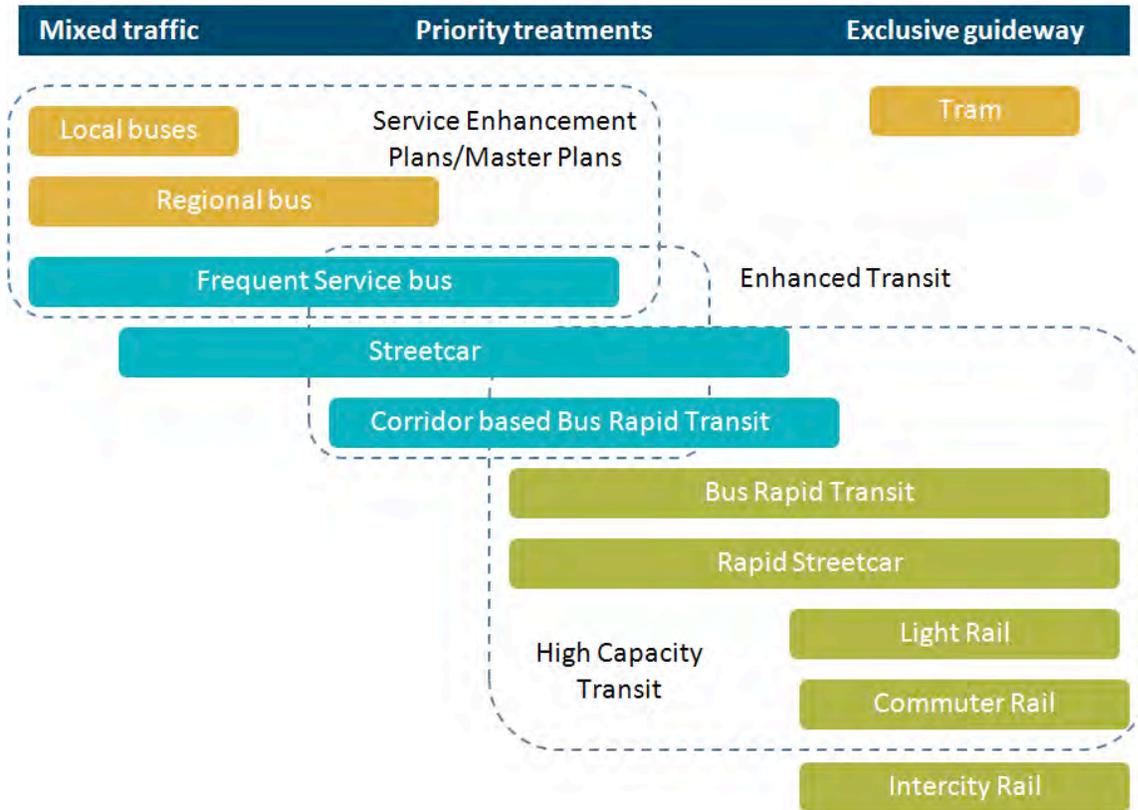
The Regional Transit Network includes future regional and local bus, enhanced transit concept corridors, high capacity transit and intercity rail, reflecting the region's updated future transit vision. Shown in **Figure 3.21**, the Regional Transit Network map has been updated to include the planned 2009 HCT connections, new enhanced transit concept corridors, streetcar and future transit service as identified by TriMet's Service Enhancement Plans and Wilsonville's Transit Master Plan. The map also highlights areas planned to be served by community-job connector shuttles.

Our existing and planned system includes a variety of transit modes, each with a special function in the overall system. Local, regional and frequent service bus lines are the backbone of our transit system. The transit providers plan for improving and expanding transit service through service enhancement plans, master plans and through annual service planning.

Our bus system operates in mixed traffic and provides service across the region. Alongside our bus system, we have implemented streetcar and corridor-based bus rapid transit (BRT). These services, along with frequent bus service, can and do include a variety of transit priority treatments. These tend to be more frequent and carry more transit riders than the regional and local bus system. The enhanced transit concept program, new to our region, provides that transit priority to help improve transit speed and reliability above the traditional transit service.

The region's high capacity transit system operates with the majority or all of the service in exclusive guideway. The high capacity transit system is meant to connect to regional centers and carry more transit riders than the local, regional and frequent service transit lines. **Figure 3.20** shows the broad transit spectrum that exists or is planned for regional transit system.

Figure 3.20 Regional Transit Spectrum



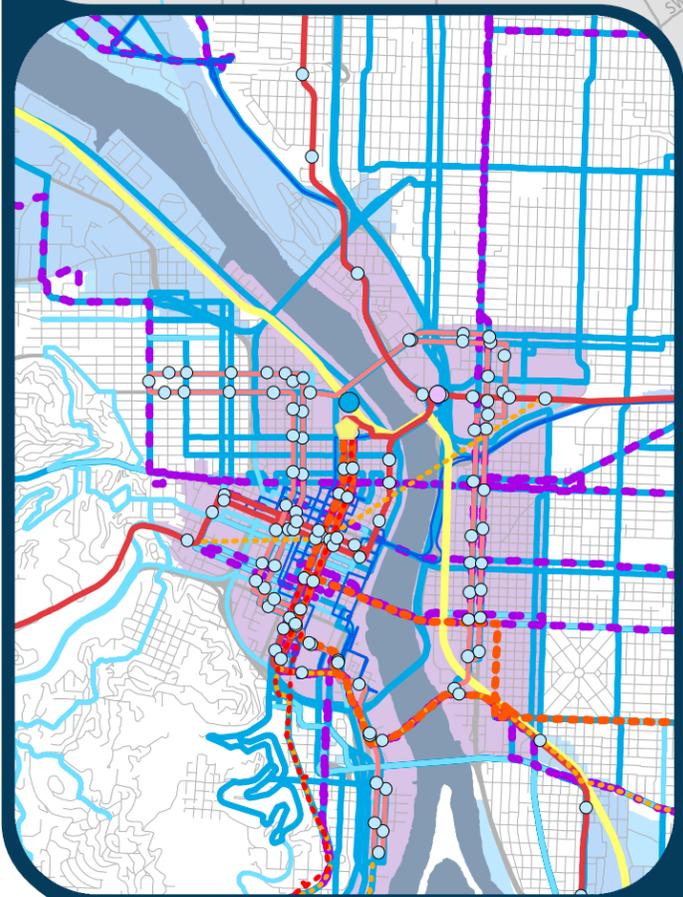
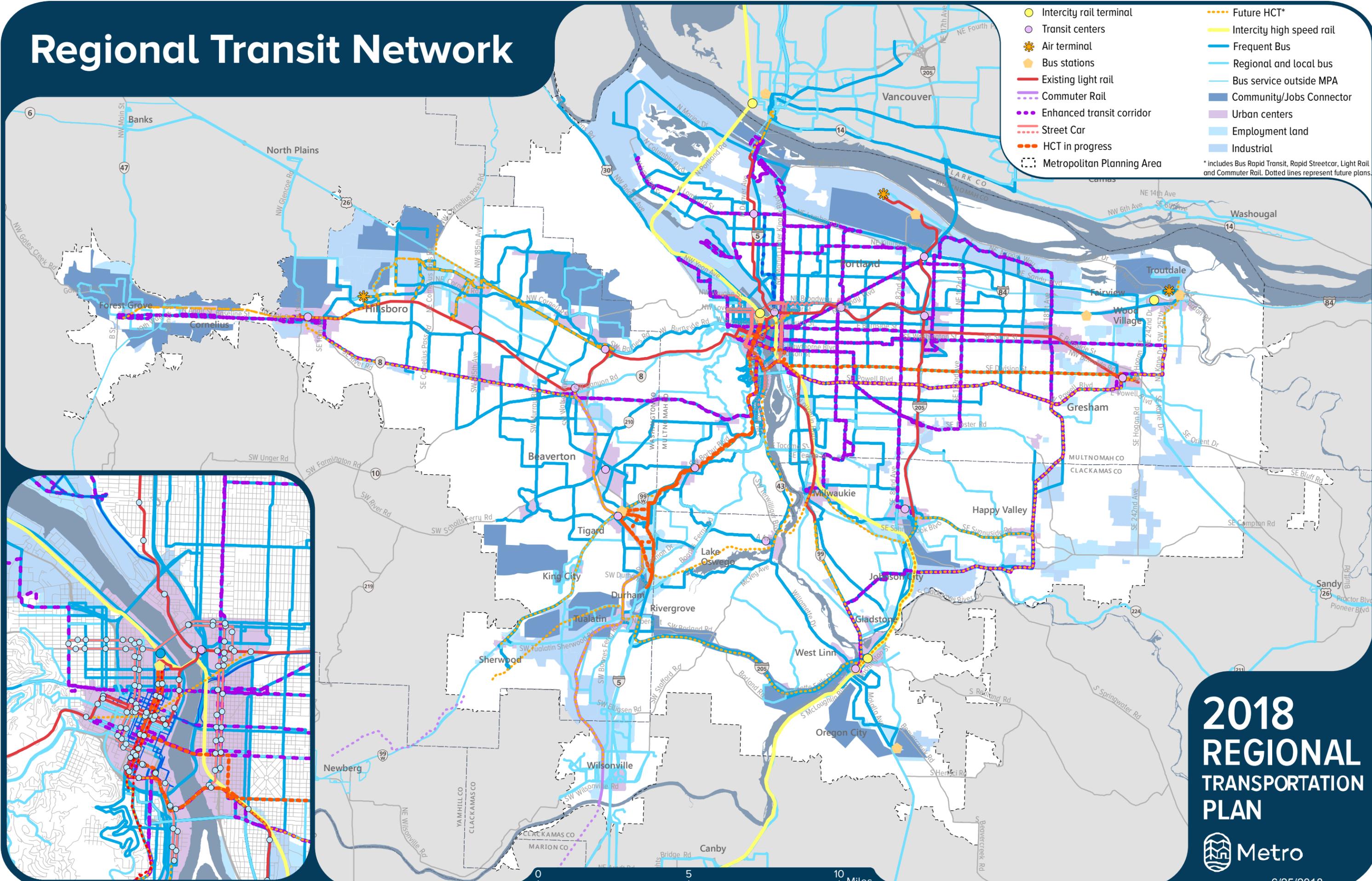
Many variables impact decisions about what type of transit mode and frequencies are most appropriate, including existing and future land uses, transit demand and opportunities and constraints.

Figure 3.21 Regional Transit Network map

I

Regional Transit Network

- Intercity rail terminal
 - Transit centers
 - Air terminal
 - Bus stations
 - Existing light rail
 - Commuter Rail
 - Enhanced transit corridor
 - Street Car
 - HCT in progress
 - Metropolitan Planning Area
 - Future HCT*
 - Intercity high speed rail
 - Frequent Bus
 - Regional and local bus
 - Bus service outside MPA
 - Community/Jobs Connector
 - Urban centers
 - Employment land
 - Industrial
- * includes Bus Rapid Transit, Rapid Streetcar, Light Rail and Commuter Rail. Dotted lines represent future plans.



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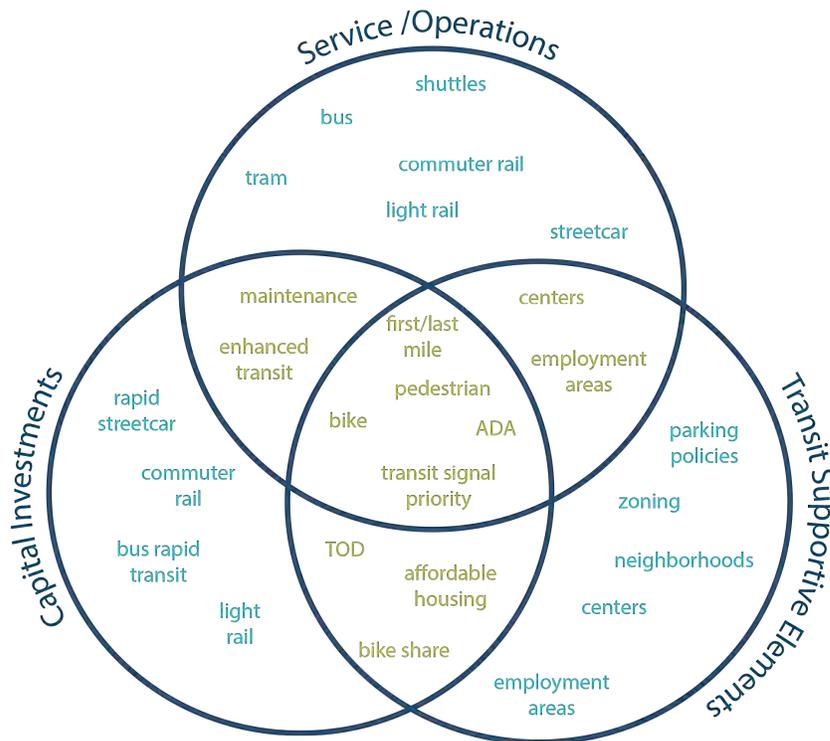
Implementation of the Regional Transit Vision

The Regional Transit Vision will be implemented through improving service, investing in infrastructure, collaborating between transit providers and local jurisdictions and expanding transit supportive elements:

- **Transit service improvements:** local and regional transit service improvements designed to meet current and projected demand in line with local and regional visions and plans.
- **Capital investments in transit:** new enhanced transit strategies such as signal priority, dedicated lanes or high capacity transit options such as bus rapid transit, light rail, commuter rail or high speed rail.
- **Transit supportive elements:** including programs, policies, capital investments and incentives such as Travel Demand Management and physical improvements such as sidewalks, crossings, and complementary land uses.

Figure 3.21 shows the relationships between these different types of investments.

Figure 3.22 Service improvements, capital investments and transit supportive elements



Public agencies and transit providers must collaborate in prioritizing transit investments throughout the region. With the passing of House Bill 2017, the Oregon Legislature has identified transit improvements and service expansion as a priority for the state. With this additional funding, the region will be able to significantly increase and expand transit service. This only highlights the need to collaborate between transit providers.

3.6.4 Regional Transit Network Policies

Regional transit priorities are informed by the following policies which aim to provide transit as an attractive and accessible travel option for all people in the greater Portland region, optimize existing transit system operations and ensure transit-supportive land uses are implemented to leverage the region’s current and future transit investments.

Regional Transit Network Policies

- Policy 1** Provide a seamless, integrated, affordable, safe and accessible transit network that serves people equitably, particularly communities of color and other historically marginalized communities, and people who depend on transit or lack travel options.
- Policy 2** Preserve and maintain the region’s transit infrastructure in a manner that improves safety, security and resiliency while minimizing life-cycle cost and impact on the environment.
- Policy 3** Make transit more reliable and frequent by expanding regional and local frequent service transit and improving local service transit options.
- Policy 4** Make transit more convenient by expanding high capacity transit; improving transit speed and reliability through the regional enhanced transit concept.
- Policy 5** Evaluate and support expanded commuter rail and intercity transit service to neighboring communities and other destinations outside the region.
- Policy 6** Make transit more accessible by improving pedestrian and bicycle access to and bicycle parking at transit stops and stations and using new mobility services to improve connections to high-frequency transit when walking, bicycling or local bus service is not an option.
- Policy 7** Use emerging technology to provide better, more efficient transit service – focusing on meeting the needs of people for whom conventional transit is not an option.
- Policy 8** Ensure that transit is affordable, especially for people who depend on transit.

Transit Policy 1. Provide a seamless, integrated, affordable, safe and accessible transit network that serves people equitably, particularly communities of color and other historically marginalized communities, and people who depend on transit or lack travel options.

The Portland metropolitan region’s economic prosperity and quality of life depend on a transportation system that provides every person and business in the region with equitable access to safe, efficient, reliable, affordable and healthy travel options and have the same opportunity to thrive, regardless of their race or ethnicity. With a transportation

system focused on mobility and access that addresses the transportation disparities faced by communities of color, the region's transportation system has the ability to open opportunities which can dramatically improve outcomes for people of color. While on the surface, a focus on racial equity may seem exclusionary, but by addressing the barriers faced by those communities, outcomes for other disadvantaged communities will improve as well.

A complete and seamless transit system is based on providing frequent and reliable bus and rail transit service during all times of the day, every day of the week. This goes far beyond the responsibility of the transit agencies; it requires actions on behalf of the region and all the jurisdictions. In order to provide frequent and reliable service, the region needs to partner together to invest in transit priority treatments and high capacity transit to ensure that transit can take people where they need to go on time.

All transit trips begin and end with different modes of access even if stations are mere steps from origins and destinations. Riders access transit via walking, bicycling, bus, rail, carpools, shared mobility (like Uber and Lyft or Biketown) and private automobiles. Safe and comfortable access to the stations is critical to the riders experience and convenience, but also makes transit fully accessible to people of all ages and abilities. Every transit rider is a pedestrian first, whether it is walking to the station, parking their bike and walking to vehicle or walking from the park and ride to the bus or rail.

Typical fixed route transit service may not make sense for everyone throughout the region. People may often rely on demand-response transit or infrequent buses that provide slow service and are costly to operate. New shared mobility models like microtransit could provide better service at lower cost in these situations. As these options continue to mature, agencies should look for opportunities to supplement demand response and underperforming service with shared mobility. This could provide better service for underserved and transit-dependent residents, and also increase resources available to serve high-demand corridors.

Technology is another tool to actively manage the Portland metropolitan region's transit system. This means using intelligent transportation systems and services to help improve the speed and reliability of transit. It also means taking advantage of the growth in personal technology to efficiently communicate information about transit options.

Transit Policy 2. Preserve and maintain the region's transit infrastructure in a manner that improves safety, security and resiliency while minimizing life-cycle cost and impact on the environment.

While our transit system is still relatively new, it will become increasingly important to invest in upkeep as the system ages. It is critical to ensure that it is well-maintained and to replace or improve outdated parts of our transit system to preserve its efficiency. In addition, the Federal Transit Administration's State of Good Repair program is dedicated maintenance of our transit system includes incorporating industry best practices and recommendations related to reliability and safety and supporting TriMet's

implementation of its Service Enhancement Plans to help transit agencies maintain bus and rail systems as part of the Moving Ahead for Progress in the 21st Century (MAP-21) Act. These grants are distributed to state and local governments to repair and upgrade rail and bus rapid transit systems that are at least seven years old.

Following the Great Recession of 2008, TriMet delayed new bus purchases for four years because of the resulting decrease in income from taxes. Starting in 2012, TriMet began to replace buses on an accelerated schedule and has since moved away from having one of the oldest fleets in the country to an industry-standard average age of eight years. According to the FTA, the average useful life of a bus is 12 years, or 500,000 miles. Another area of investment for TriMet is the MAX system, parts of which are more than 30 years old. While the FTA's assigned life expectancy for rail cars is 25 years, industry experience reports a 30-35 year lifespan in reality. Nevertheless, the TriMet light rail system will soon be in need of repairs and upgrades.

It's also important that to plan for the future capacity needs of our transit system. As our region grows and ridership on our public transportation system is ever increasing, the region is starting to push the limits of what our existing infrastructure can handle. This creates more transit bottlenecks throughout the region, increasing congestion and decreasing the reliability of our transit system. Some lines already have many buses running behind schedule due to heavy traffic, which leads to unpredictable service. Other lines suffer from overcrowding. Popular lines will always have standees, but some trips have such high ridership that at times, riders are unable to board and must wait for another vehicle. In order to make transit more reliable and convenient, these factors must also be addressed.

Some recent maintenance projects and improvements that TriMet has undertaken include:

- Replacing switches and realigning the trackway at the Rose Quarter
- Replacing switches and reconstructing rail at SW 11th Avenue in Downtown Portland
- Completing design for reconstructing MAX trackway over the Steel Bridge
- Beginning a four-year replacement of overhead power contact wire on the original MAX Blue Line between Cleveland Ave in Gresham to Lloyd Center
- Upgrading and repairing platform areas at Gresham City Hall and Washington Park stations

Other improvement projects include planned upgrades to fourteen (14) MAX Blue Line stations between NE 42nd/Hollywood and Cleveland that include safety improvements and electronic display installations. Pedestrian crossings and shelters are being improved; trees on or near the platform are being removed to make space for lighting and improve the line-of-sight for security cameras.

Transit Policy 3: Make transit more reliable and frequent by expanding regional and local frequent service transit and improving local service transit options.

Expand regional and local frequent service transit

In 2040 corridors, main streets and centers, the RTP recommends supporting transit by providing transit-supportive development and well-connected street systems to allow convenient bicycle and pedestrian access.

As mentioned earlier, Frequent service transit is defined as wait times of 15 minutes or less from the early morning to late in the evening, seven days a week. Frequency is especially important for making transit more competitive with driving for riders who take short, local trips, because the time riders spend waiting for a bus to take a short trip is a proportionately larger component of the total travel time than it is for longer trips.

Frequent bus service is appropriate when high ridership demand is demonstrated or projected, the streets are pedestrian-friendly, there are high proportions of transit-dependent residents, the lines connect to existing or proposed HCT corridors, and/or it serves multiple centers and major employers. Exhibiting many of the same service characteristics as frequent bus service, streetcar service functions primarily as a connection within and between 2040 centers and corridors.

Preferential treatments, such as transit signal priority, covered bus shelters, curb extensions, special lighting, enhanced sidewalks, protected crosswalks and bikeways, are all fundamental to making the frequent service bus and streetcars elements of the transit network function at its highest level. In select locations, park-and-ride facilities may provide vehicular access to the frequent service network, especially for areas that cannot be well-served by local transit due to topography, street configuration, or lack of density.

Types of frequent transit services and facilities include:

- Frequent bus
- On-Street Bus Rapid Transit
- Streetcar (Local)
- Express Bus
- Enhanced Transit elements
- Regional transit centers and stops
- Bicycle stations/parking
- Park-and-ride facilities

Transit service improvements and expansion should be prioritized, with an emphasis on congested transit lines that serve historically marginalized communities. Decisions about transit investments should be assessed with an equity lens to ensure transit access for our most vulnerable communities.

Improve local service transit

The local transit network provides basic service and access to local destinations and the frequent and high capacity transit network. Service span and frequencies vary based on the level demand for the service. The local transit network ensures that the majority of the region's population has transit service available to them.

Local transit service is appropriate where there is some transit demand, but not enough to support regional or frequent service. Local transit is designed to provide full transit service coverage to the region. Transit preferential treatments and passenger facilities are appropriate at high ridership locations. Sidewalk connectivity, protected crosswalks and bikeways are all fundamental to making the local transit service elements of the transit network function at its highest level.

Providing local bus service increases the convenience of transit, particularly for areas without frequent service transit or where traditional transit service is not viable. Local transit service also expands community and regional transit service across the region that improves access to jobs and community places and can help facilitate that first/last mile connections where business and or homes are spread out and regional fixed-route bus service is not cost effective.

Demand responsive services

One foundational support of the regional transportation system in both urban and rural areas is the availability of demand-response services. These services provide access to transportation that “fills in the gaps” where fixed-route transit, complementary paratransit, or deviated fixed-route “last mile” shuttle services are not the appropriate or most cost-effective tool to meet the need of low income individuals, seniors or people with disabilities. Because these services operate in the background, as a coordinated addition to the total transportation system, they often go unnoticed. However, they provide a lifeline of service to low-income people who experience barriers to accessing the transportation system. Each year over 500,000 trips are provided on demand-response services throughout the region, and current service is still not enough to meet the existing demand or projected growth in demand concurrent with the region's growing population.

Types of local transit services include:

- Local Bus
- Para-Transit
- Deviated “On-Demand” routes
- Community and job connector shuttles
- Employer Shuttle Service
- Community Event Shuttles

- Tram

In order to reach our regional transit objectives local transit service improvements and expansion should be coordinated with TriMet's Coordinated Transportation Plan for Seniors and Persons with Disabilities and the Special Transportation Funds Advisory Committee (STFAC).

Transit Policy 4: Make transit more convenient by expanding high capacity transit; improving transit speed and reliability through the regional enhanced transit concept.

Expand high capacity transit, to serve transit dependent populations and improve system performance between key destinations

High Capacity Transit (HCT) investments help the region concentrate development and growth in its centers and corridors. The regional transit network concept calls for fast and reliable HCT service between the central city and regional centers. HCT service carries high volumes of passengers quickly and efficiently, and serves a regional travel market with relatively long trip lengths to provide a viable alternative to the automobile in terms of convenience and travel time.

High capacity transit provides greater connections between the Portland Central City, regional centers, and passenger intermodal facilities. It operates on a fixed guideway or within an exclusive right-of-way, to the extent possible. High capacity transit strives for frequencies of 10 minutes or better during the peak hours and 15 minutes during off peak hours. Passenger infrastructure at HCT stations and within station communities often include enhanced amenities, such as real-time schedule information, ticket machines, special lighting, benches, shelters, bicycle parking, civic art and commercial services.

To optimize and leverage transit supportive land uses, alignments and station locations should be oriented towards existing and future high density, mixed-use development. To this end, urban form and connectivity, redevelopment potential, market readiness, public incentives and infrastructure financing should all be considered during the corridor refinement and alternatives analysis phases of project development. High capacity transit investments are informed by the HCT assessment and readiness criteria described in the implementation chapter of the Regional Transit Strategy).

Types of high capacity transit types, facilities and services include:

- Light Rail Transit (MAX)
- Rapid Streetcar (Streetcars running in mostly exclusive right-of-way so that they are able to travel faster safely)
- Bus Rapid Transit (majority of service operates in separate and dedicated right of way, defined stations, transit signal priority, short headways).
- On-Street Bus Rapid Transit (substantial transit investment, some separate or dedicated right of way, defined stations, transit signal priority, short headways).

- Commuter Rail (WES)
- Interurban Passenger Rail (e.g., Amtrak or regional rail systems in other regions)
- Intermodal Passenger Facilities (e.g., Union Station and Greyhound)
- Secure bicycle parking (Bicycle stations or Bike & Rides)
- Park & Ride lots
- Transit Centers
- Transit Stations

Major infrastructure investments have implications within the communities they are located. Historic data shows that a major HCT investment contributes to both positive and negative outcomes for the communities they serve. It is critical that during the planning for a new HCT investment, a strategy should be developed that considers both the positive and negative impacts of the investment, particularly as it applies to the most at-risk populations. These tend to be people of color, low income, low English proficiency, older adults and youth. Additionally, these populations tend to be our most transit dependent. What this means is that their potential displacement from the economic pressures that the investment brings, ultimately leads to undermining the long-term effectiveness of the investment. By planning all new HCT lines through an Equitable Development Framework, we can attempt to lessen the negative impacts of the investment, while enhancing the opportunity that these transit-dependent populations benefit from it, by limiting residential and business displacements and gentrification.

Any HCT planning effort should directly incorporate community in the decision-making process. The process should also be informed and include an assessment of data with an equity lens. Where possible HCT, projects should also enhance the contracting and job training benefits and opportunities for displaced and historically marginalized populations.

The HCT assessment and readiness criteria, described in more detail in Chapter 7 of the Regional Transit Strategy, provides a framework to inform advancing HCT transit projects identified in the RTP and Regional Transit Strategy.

Improve transit speed and reliability through the regional enhanced transit concept

In order to meet the region’s environmental, economic, livability and equity goals as we grow over the next several decades, we need to invest more in our transit system, particularly the frequent service bus network. There are many ways to increase transit speed and reliability throughout our system. The region should pursue opportunities as they arise to improve the efficiency of our system to support our transit riders.

The Enhanced Transit Concept (ETC) program is one way to do this, and employs new public partnerships to service treatments that increase capacity and reliability, yet are

relatively low-cost to construct, context-sensitive, and able to be deployed quickly throughout the region where needed.

ETC can be implemented through the coordinated investment of multiple partners and has the potential to provide major improvement over existing service or even our region’s best frequent service, but less capital-intensive and more quickly implemented than large scale high capacity transit. Investments would serve our many growing mixed-use centers, corridors, and employment areas that demand a higher level of transit service but are not seen as short-term candidates for light-rail, or bus rapid transit.

ETC partnerships could also create more reliable, higher quality transit connections to connect low-income and transit-dependent riders to jobs, school and services. It would allow for a more fine-grained network of higher-quality transit service to complement our high capacity transit investments, relieve transit congestion and grow ridership throughout the region.

Preferential treatments, such as transit signal priority, covered bus shelters, special lighting, enhanced sidewalks, and protected crosswalks are also all fundamental to making the ETC network function at its highest level.

Improving the speed and reliability of our frequent service network could be implemented at the regional scale, along corridors or at “hot spot” locations. Table 2 describes the different types of treatments that have the potential to improve reliability.

Table 3.23 Enhanced Transit Treatments

Regional	Hotspot
Bus on shoulder	Dedicated bus lane
Transit signal priority and signal improvements	Business access and transit (BAT) lane
Headway management	Intersection queue jump/right turn except bus lane
Corridor	Transit-only aperture
Level boarding	Pro-time (peak period only) transit lane
All door boarding	Multi-modal interactions
Bus stop consolidation	Curb extension at stops/stations
Rolling stock modification	Far-side bus stop placement
Transit signal priority and signal improvements	Street design traffic flow modifications

Transit Policy 5: Evaluate and support expanded commuter rail and intercity transit service to neighboring communities and other destinations outside the region.

Intercity passenger rail and bus service to communities outside of the region provides an important connection to the regional transit network. A high level assessment of potential demand for commuter rail outside of the Portland urban growth boundary was conducted as part of the 2009 High Capacity Transit System Plan.

The demand estimates of ridership potential are highly conceptual and were developed only to determine the order of the magnitude of differences between corridors, not as

actual predictions of ridership. The estimates are not based on detailed alignment, station location or service concepts. Rather, they estimate the potential to attract riders based on comparable commuter rail services in operation in the United States and the overall demand for work travel between the major corridor markets.

Key findings from this analysis are summarized below:

- **Potential Intercity Corridor.** A potential future **commuter rail line to Newberg** may be feasible in the long term. Even though the riders per mile analysis looks favorable due to the relatively short distance of the line, the overall population in the rail shed is very low compared to other corridors, and overall ridership is relatively low. Metro, regional partners and corridor communities should consider right-of-way preservation for this corridor and consider land use planning activities that focus on transit-supportive development around potential future commuter rail station areas.
- **Promising Intercity Corridor. Salem/Keizer** is the most promising of the corridors evaluated. In addition to the highest market potential, this corridor has a number of favorable aspects: there is existing Amtrak passenger rail service in the corridor, this is a lightly used freight corridor that was evaluated in the 2001 Oregon Rail study as a potential commuter rail corridor, and an alignment could easily tie into the WES commuter rail service now operating to Wilsonville. If the region or state chose to focus on the development of inter-regional rail service, this alignment should take priority. After coming to a similar conclusion about this corridor, the Oregon State Legislature passed House Bill 2408, which directs ODOT to study the possible extension of commuter rail service from Wilsonville to Salem, which is currently serviced by SMART today.

In addition, the Pacific Northwest Corridor is one of ten corridors identified for potential high-speed rail investments to better connect communities across America. This corridor provides an important intercity rail connection between Eugene, Oregon and Vancouver, British Columbia. More work is needed to determine what partnerships, infrastructure investments and finance strategies are needed to support this level of service. More information about current efforts to support high speed rail are described in Chapter 6 of the Regional Transit Strategy.

Figure 3. 24 U.S. High Speed Intercity Passenger Rail Network



Source: U.S. Department of Transportation (April 2016)

Transit Policy 6: Make transit more accessible by improving pedestrian and bicycle access to and bicycle parking at transit stops and stations and using new mobility services to improve connections to high-frequency transit when walking, bicycling or local bus service is not an option.

Improve pedestrian and bicycle access to and bicycle parking at transit stops and stations

Providing safe and direct walking and biking routes and crossings that connect to transit stops ensures that transit services are fully accessible to people of all ages and abilities. At some point in their trip, all transit riders are pedestrians. The environment where people walk to and from transit facilities is a significant part of the overall transit experience. An unattractive or unsafe walking environment discourages people from using transit, while a safer and more appealing pedestrian environment may increase ridership. Likewise, high quality local and regional bicycle infrastructure extends the reach of the transit network, allowing more people to access transit from longer distances. **Figure 3.25** depicts the Metro region’s priorities for providing multi-modal access to the region’s

transit service. It prioritizes walking and biking to transit and deemphasizes driving to transit.

Establishing pedestrian and bicycle connections to bus and train stations and stops helps extend the reach of the transit network, making trips made by transit feasible and accessible for more people of all ages and abilities, including seniors and people with disabilities. Transit, pedestrian and bicycle travel benefit as improvements are made to each of the modes.

Improving pedestrian and bicycle access to transit is accomplished through:

- filling sidewalk gaps within a mile of stops and stations;
- filling bicycle and trail network gaps within three miles of stops and stations;
- integrating trail connections with transit;
- providing shelters, transit tracker information and seating at stops and stations;
- providing bicycle amenities at transit centers such as repair stations and lockers;
- providing pedestrian and bicycle protected crossings at stations and stops where appropriate, including secured, covered bicycle parking or Bike and Rides at stations and stops;
- allowing bicycles on board transit and exploring the use of apps to let bicycle riders know if a bus or train has bicycle space available;
- locating transit stops and stations on bicycle and pedestrian maps, integrating biking, walking and transit on tools such as TriMet's Trip Planner and Transit Tracker;
- co-locate bike and car sharing facilities at transit stations to improve active transportation connections and manage parking demand, which helps to create a safer walking and bicycling environment; and
- Linking modal systems in regional and local transportation plans.



Figure 3.25 Regional Transit Access Priorities

Explore new ways to improve connections to high frequency transit

Advances in technology have given rise to new transportation options that make it easier for people to share vehicles and rides and provide a potential first/last miles connection. Many of these options are already widely used in our region:

- In the city of Portland, transportation network companies (TNCs) Uber and Lyft provided an estimated 7 million rides in 2017. We do not know how many of these were first/last mile connections to transit.
- Car sharing services operate over 1,000 vehicles in the region, and though some of these services have been around for a decade, new models have sprung up, including free-floating car sharing companies like ReachNow and Car2Go that allow people to pick up and drop off a car anywhere within a defined service area.
- The City of Portland's bike share system, BIKETOWN, launched in July 2016, and carried over 300,000 trips in its first year. Many of the bikeshare stations are purposefully co-located at transit stations.

Other innovations are not yet available in our region, but may be soon:

- Shared electric bikes or scooters allow riders to take easier or longer-distance trips than they could on a conventional bicycle.
- Microtransit, which refers to services that use smart phones to allow riders to book trips, collect data to tailor routes that meet riders' needs and serve these routes with vehicles that are smaller than conventional buses, can be a viable model for communities that don't have high enough ridership for conventional transit to pencil to be cost effective.

These new options, along with conventional shared modes like transit, carpools, and vanpools, are often referred to collectively as "shared mobility." Combining transit and other shared modes can provide better service for travelers while creating better environments around stations. People who might otherwise need to drive to can instead use a combination of shared mobility and transit. In these situations, shared mobility provides more convenient connections to stations, but taking transit for the bulk of the trip keeps the journey more affordable. If more people use shared modes to get to transit rather than driving, it can free up space that might otherwise be used for parking for public spaces, bicycle and pedestrian facilities or development. In order to deliver on this potential, Metro and our partners need to improve connections between shared mobility and transit. There are several actions we can take.

- Dedicate space for shared mobility at transit stations. Accommodating bike share stations or pods of car share vehicles at transit stops makes it easy for transit riders to use these options. Setting aside space for pickups and dropoffs near stations can make it more convenient for people to access options to transit, as well as improve safety by reducing conflicts between modes. At stations with parking, reserving premium spaces

for carpools or shared vehicles can provide an incentive for travelers to share trips instead of driving alone.

- Coordinate with shared mobility companies to provide shared connections to transit stations. Several communities already support vanpools or operate shuttles to and from transit stations. Similarly, public agencies can work partner with microtransit or carsharing companies to provide new connections to transit and promote the use of these services.
- Make it easy to plan and book transit and shared mobility trips. Smartphone apps are now the most common way for people in the Portland region to access information about their transportation options. At a minimum, transit agencies should make schedule and route information available through their own online tools as well as in general transit feed specification format so that it can be incorporated into apps like Google Maps, TransitApp, and moovel. TriMet's Open Trip Planner Shared-use Mobility project will create a platform to integrate data on transit and shared mobility options so that riders can easily plan multimodal trips. The ability to book and pay for multimodal trips on a single platform could make transit-shared mobility connections even more convenient.

There are two important issues to consider when integrating transit and shared mobility data. The first is ensuring that third-party apps use that data in a way that supports transit. No matter how easy-to-use or informative the apps and websites that public agencies develop are, a significant number of people will get data from third-party apps. The companies that develop these apps often monetize transit data by showing advertisements for TNCs that show how much quicker a rider could reach a destination by paying extra for an Uber or Lyft. These advertisements can draw people away from taking transit, and agencies should consider whether they want to place conditions on the use of transit data by third parties.

The second is maintaining access for the many people who can't access apps or make online payments, which can include low-income people, undocumented people, people with disabilities, or people with limited English proficiency—in other words, many of the same travelers who rely on transit. Phone-based concierge services or cash-based payment services at convenient locations, as well as traditional fare media and schedules, can help these people continue to access transit.

Design and manage designated transit streets to prioritize transit and shared travel. Dedicating transit lanes and rights of way and prioritizing buses at signalized intersection are widely used strategies to help transit vehicles move more quickly. As the region explores congestion pricing, we should consider methods of pricing that reduce tolls for higher occupancy vehicles. More TNCs picking people up and dropping them off means that curb space is increasingly valuable, and the use of global positioning systems on TNC vehicles makes it possible to manage where these vehicles drop people off and pick them up. Agencies can manage the curbside to prioritize TNCs carrying more than one passenger and avoid conflicts with transit vehicles.

Transit Policy 7: Use emerging technologies to provide better, more efficient transit service, including focusing on meeting the needs of people for whom conventional transit is not an option.

Emerging technology is a highly advancing field that can provide opportunities to improve transit service and efficiency. The region should incorporate emerging technologies to achieve our regional goals. One key way to do this is through the application of technology to serve areas that are more difficult to serve by traditional transit service.

Our region is home to many people with disabilities who require specialized vehicles and point-to-point service, as well as people who depend on transit but live in communities where fixed-route service doesn't make sense. These people often rely on demand-response transit or infrequent buses that provide slow service and are costly to operate. New shared mobility models like microtransit could provide better service at lower cost in these situations. As these options continue to mature, agencies should look for opportunities to supplement demand response and underperforming service with shared mobility. This could not only provides better service for underserved and transit-dependent residents, but also increase resources available to serve high-demand corridors. Over the longer term, autonomous vehicle (AV) technologies have the potential to make transit work more efficiently everywhere, and transit agencies should look for opportunities to test these technologies and understand their potential benefits as they become available.

Transit Policy 8: Ensure that transit is affordable, especially for people who depend on transit.

The cost of transportation burdens many households in the metropolitan region. Transportation is usually the second largest share of household costs (after housing) and are particularly burdensome for low-income households who often have the longest distances to travel. It is therefore important to ensure that transit is affordable, particularly for the riders that need it the most (i.e. the riders who do not have access to cars). Ensuring that transit is affordable alleviates the cost of owning automobiles; in the



Transit is a critical option for those in need, the most efficient way to move people along crowded streets, and the backbone of many communities. It is difficult to imagine a positive future for the region without it.

In order to make sure that transit thrives, we need to enhance service on high-ridership lines while piloting new ways to provide transit (like microtransit or using new mobility services to connect to stations) in communities that are challenging to serve with large buses traveling on fixed routes.

Portland Metro Region, an individual saves an average of \$10,477 annually by switching from cars to public transit (APTA, June Transit Savings Report, 2017).

Low-income households, people of color, people with disabilities, children, older adults, and people with limited English proficiency are those most affected by transportation costs because they're historically more transit-dependent than others. As our region continues to grow in both population and diversity, embracing this growing diversity means providing service that is equitable. Using equity as a lens to guide decisions ensures that the transit system benefits those who rely on it the most.

SMART routes within the City of Wilsonville are free, while other routes running to Canby, Tualatin, Barbur Transit Center, and Salem charge a fee. SMART also offers a reduced half price pass for older adults (60 years and older), persons with disabilities, Medicare card holders and youth riders (5-17 years old or students to 23 years old with valid student ID).

Expanded payment options

TriMet also rolled out the Hop Fastpass, a state-of-the-art electronic fare system for TriMet, C-TRAN, and Portland Streetcar. Riders will be able to choose from a variety of payment options, including a transit-only smart card, contactless bank card, and smartphones with contactless technology built in. One benefit of the Hop Fastpass for low-income riders is a daily and monthly cap on fares paid. Riders who use the system for two full-fare trips will be able to ride the rest of the day for free. Similarly, after using the Hop Fastpass for the equivalent cost of a monthly pass, riders will be able to use the transit system for free for the rest of the month. The Hop Fastpass therefore allows riders to buy daily and monthly passes one installment at a time, making discounts available to those who can't afford the cost of a daily or monthly pass up front.

Reduced fare programs

TriMet has already implemented several programs in order to make transit affordable. Reduced fares are available to youths ages 7-17 and students in high school or pursuing a GED, and children 6 and under ride for free with a paying passenger. High school students in the Portland Public School District can ride for free during the school year as well by showing their student ID. Honored citizens, which include those over 65, those on Medicare, or those with disabilities are also eligible for reduced fares. Access Transit fare programs help low-income riders, including low-income seniors and riders with disabilities. These programs provide fares to non-profit and community-based organizations at lower to no cost, which are then distributed to clients.

Over the last few years, TriMet has been working toward a reduced fare program for people with limited incomes. A task force of advocates, community members and elected officials recommended a low income fare program where adults at or below 200 percent of the federal poverty level would be eligible for half-priced fare. Implementation of this program means that adults making up to \$24,120 a year could take a ride for \$1.75, and buy a day pass for \$2.50 (the same price as Honored Citizen and Youth fares). Participants would use a reduced fare Hop card similar to an Honored Citizen or Youth card. House Bill 2017 provided the funding to implement the TriMet Low-Income Fare Program.

Partnerships and advocacy

To ensure that transit remains affordable, the region should build partnerships with non-profit and human service providers to support the dissemination of information about these fare programs and to work through ways in which these programs can be more effective. This should also include advocating in the state legislature and to the voters to increase, deepen, and sustain long-term funding for programs which support keeping transit affordable for riders.

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 connect industrial areas, marine terminals and pipeline terminals to rail yards. Pipelines transport petroleum products to and from terminal facilities.

3.7.2 Regional Freight Network Policies

The Regional Freight Network Policies reflect the policy framework of the Regional Freight Strategy. Specific actions that Metro, in partnership with cities, counties, agencies and other stakeholders can take to implement the policies are identified in Chapter 8 of 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 the region’s multimodal freight network to reduce delay, increase reliability and efficiency, 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 the region’s 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.

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

A comprehensive, systems approach is central to planning, managing, and using the region’s multimodal freight transportation infrastructure. This approach provides a strong foundation for addressing core throughway network bottlenecks, recognizing and coordinating both regional and local decisions to maintain the flow and access for freight movement that benefits all.

The transport and distribution of freight occurs via a combination of interconnected publicly- and privately-owned networks and terminal facilities. Rivers, mainline rail, pipeline, air routes, and arterial streets and throughways connect our region to international and domestic markets and suppliers beyond our boundaries.

Inside our 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 connect industrial areas, marine terminals, and pipeline terminals to rail yards. Pipelines transport petroleum products to and from terminal facilities.



Freight Policy 2. Manage the region’s multimodal freight network to reduce delay and increase reliability and efficiency, improve safety and provide shipping choices.

The 2005 Cost of Congestion to the Economy of the Portland Region Study reported that our region has a higher than average dependency on traded sector industries, particularly computer/electronic products, wholesale distribution services, metals, forestry/wood/paper products, and publishing; business sectors that serve broader regional, national, and international markets and bring outside dollars into the region’s economy.

These industries depend on a well-integrated and well-functioning international and domestic transportation system to stay competitive in a global economy.

As an international gateway and domestic freight hub, the region is particularly influenced by the dynamic trends affecting distribution and logistics. As a result of these global trends, U.S. international and domestic trade volumes are expected to grow at an accelerated rate. The value of trade in Oregon is expected to double by 2040, to \$730 billion.¹¹ The region’s forecasted population and job growth – an additional 917,000

¹¹ Federal Highway Administration, Freight Analysis Framework version 3.4, 2013

residents and 597,000 jobs to be added between 2010 and 2040¹² – along with the associated boost in the consumption of goods and services are significant drivers of projected increases in local freight volume.

This policy is 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.

It is critical to maximize system operations and create first-rate multimodal freight networks that reduce delay, increase reliability, maintain and improve safety and provide cost-effective choices to shippers. In industrial and employment areas, the policy emphasizes providing critical freight access to the interstate highway system to help the region's businesses and industry in these areas remain competitive. Providing access and new street connections to support industrial area access and commercial delivery activities and upgrading main line and rail yard infrastructure in these areas are also emphasized.

Ensure adequate investment in freight capacity

In order to carry out an overall policy of reducing delay and increasing reliability, it will be necessary to expand the types of programs and amounts of funding for freight transportation infrastructure to adequately fund and sustain investment in our multimodal freight transportation network in order to ensure that the region and its businesses stay economically competitive.

Freight 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 better inform elected officials when making land use and transportation decisions, a program that informs the public is required.

Potential freight impacts should be considered in all modal planning and funding, policy and project development and implementation and monitoring. This also means better informing the region's residents and decision makers about the importance of freight movement on our daily lives and economic well-being. Metro will work with its



Reducing delay and increasingly reliability of the freight network is critical for the health our regional economy.

¹² Metro 2040 growth forecast. Represents forecasted population and jobs within 4-county area (Multnomah, Clackamas, Washington and Clark counties).

transportation partners to improve the level of freight information available to decision-makers, the business community and the public.

Freight 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 policy 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 reducing greenhouse gas emissions.

It is important to ensure that the multimodal freight transportation network supports the health of the economy and the environment by pursuing clean, green and smart technologies and practices. Details of the most promising innovations and technologies have been developed as part of the Regional Freight Strategy’s Technology for Sustainable Freight Transport, as identified in Chapter 6 of the strategy.



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

Freight 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.

This policy 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.

It is important to integrate freight mobility and access needs in land use decisions to ensure the efficient use of prime industrial lands, protection of critical freight corridors and access for commercial delivery activities. This includes improving and protecting the throughway interchanges that provide access to major industrial areas, as well as the last-mile arterial connections to both current and emerging industrial areas and terminals.

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

This policy focuses on planning and building capital projects and developing the funding sources, partnerships, and coordination to implement them.

It is important to look beyond the roadway network to address needs of the multi-modal and intermodal system that supports our regional economy. As described in the Regional Freight Strategy, freight rail capacity is adequate to meet today’s needs but as rail traffic increases additional investment will be needed in rail mainline, yard and siding capacity.¹³ Whenever right-of-way is considered for multiple uses such as freight rail, passenger rail and trails, analysis must include long-term needs for existing freight and freight rail expansion to ensure that necessary future capacity is not compromised.

In addition, 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.

Freight 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 policy and the potential design solutions focuses on addressing the issue of eliminating fatalities and serious injuries due to freight vehicle crashes with passenger vehicles, bicycles and pedestrians.

Trade-dependent state economies

Exports: In 2012 Oregon state exports totaled \$18 billion. Portland ranked 4th among the largest 100 U.S. metro areas in terms of export value as a share of metro output (24 percent).

Businesses: Oregon companies depend on Portland’s marine, rail, air and road facilities for access to resources and markets: onions, apples, hazelnuts, grass seed, seafood, wood products, Les Schwab, Fred Meyer, Intel, Nike, Columbia Sportswear, etc.

Jobs: 490,000 Oregon jobs tie directly or indirectly to, or supported by, international trade

Sources: Portland Business Alliance, Today More than Ever:

Oregon and Portland/Vancouver Depend on International Trade and Investment, 2013 exports as a percentage of gross state product.

¹³ Port of Portland, Port of Portland Rail Plan, 2013

3.7.3 Regional Freight Network Classifications and Map

The Regional Freight Network map, shown in **Figure 3.27** applies the regional freight network concept on the ground to identify the transportation networks and facilities that serve the region and the state's freight mobility needs. (See <http://gis.oregonmetro.gov/RTP/> for zoomable version.) The regional freight network has a functional hierarchy similar to that of the regional motor vehicle network.

To show the continuity of the freight system in both Oregon and Washington state, the map shows the freight routes in Clark County, north of the Columbia River and rural freight routes designated by Clackamas and Washington counties that connect to the regional freight network designated within the metropolitan planning area boundary. The Regional Freight Network map also includes six inset maps (brown dotted line boxes) that focus on the key intermodal facilities (marine terminals, rail yards and pipeline facilities) and rail lines to highlight the importance of the rail network, and have better visibility for the rail lines. These inset maps are located on the back side of the main map.

The different functional elements of the regional freight network are:

- **Main line rail** - Class I rail lines (e.g., Union Pacific and Burlington Northern/Santa Fe).
- **Branch line rail** – Non-Class 1 rail lines, including short lines (e.g., Portland and Western Railroad).
- **Main roadway routes** - Designated freight 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.
- **Regional Intermodal Connectors** – Roads that provide connections between major rail yards, marine terminals, airports, and other freight intermodal facilities; and the freeway and highway system. 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.

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 country.

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

- **Marine facilities** - A facility where freight is transferred between water-based and land-based modes.
- **Rail yards** - A rail yard, railway yard or railroad yard is a complex series of railroad tracks for storing, sorting, or loading and unloading, railroad cars and locomotives. Railroad yards have many tracks in parallel for keeping rolling stock stored off the mainline, so that they do not obstruct the flow of traffic.

Figure 3.27 Regional Freight Network Map

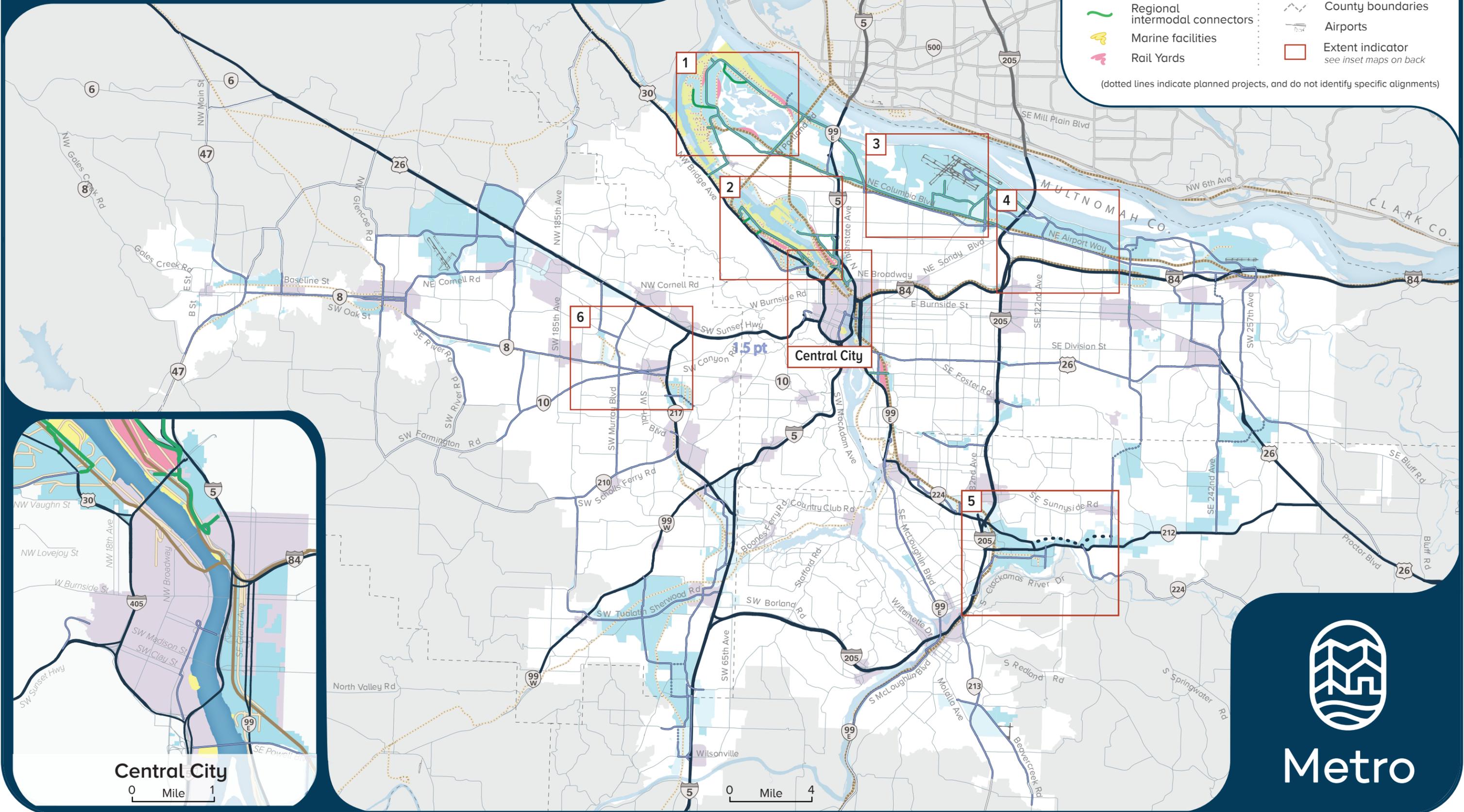
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Regional Freight Network [DRAFT]

June 12, 2018

-  Main rail lines
-  Branch rail lines
-  Main roadway routes
-  Roadway connectors
-  County routes outside MPA boundary
-  Regional intermodal connectors
-  Marine facilities
-  Rail Yards
-  Employment
-  Industry
-  Urban centers
-  Metropolitan planning area (MPA)
-  County boundaries
-  Airports
-  Extent indicator
see inset maps on back

(dotted lines indicate planned projects, and do not identify specific alignments)



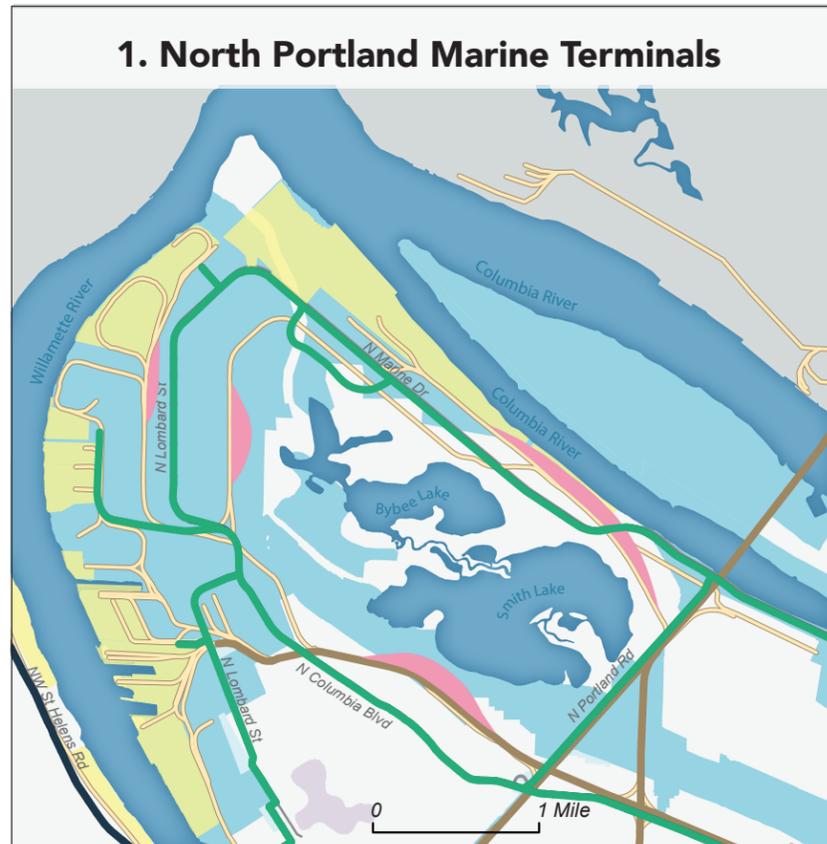
Metro

Central City

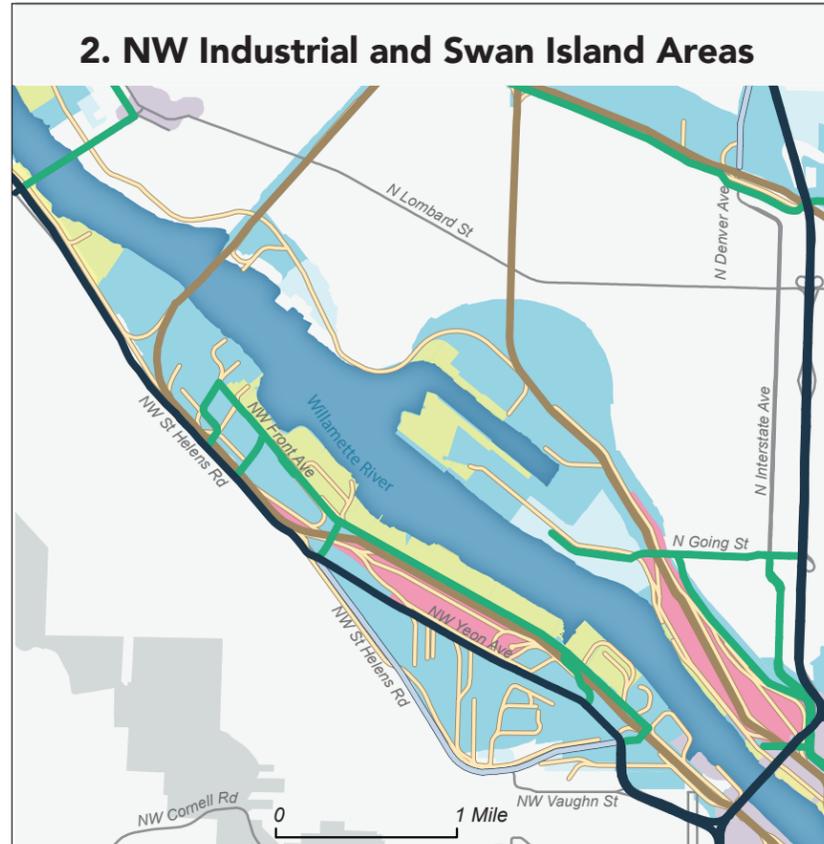
0 Mile 1

0 Mile 4

1. North Portland Marine Terminals



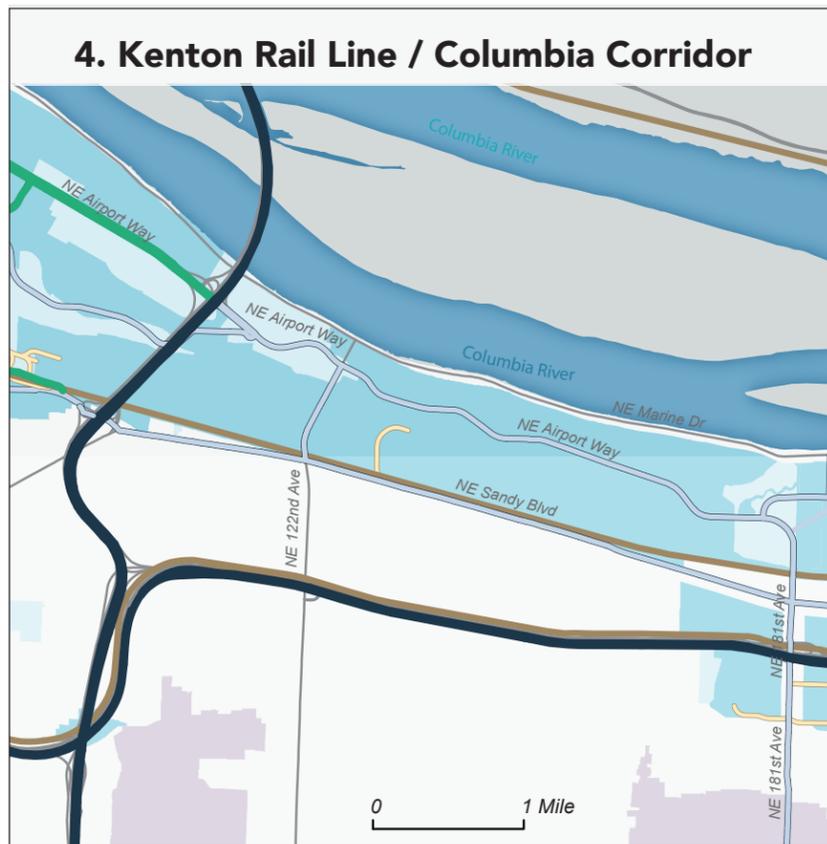
2. NW Industrial and Swan Island Areas



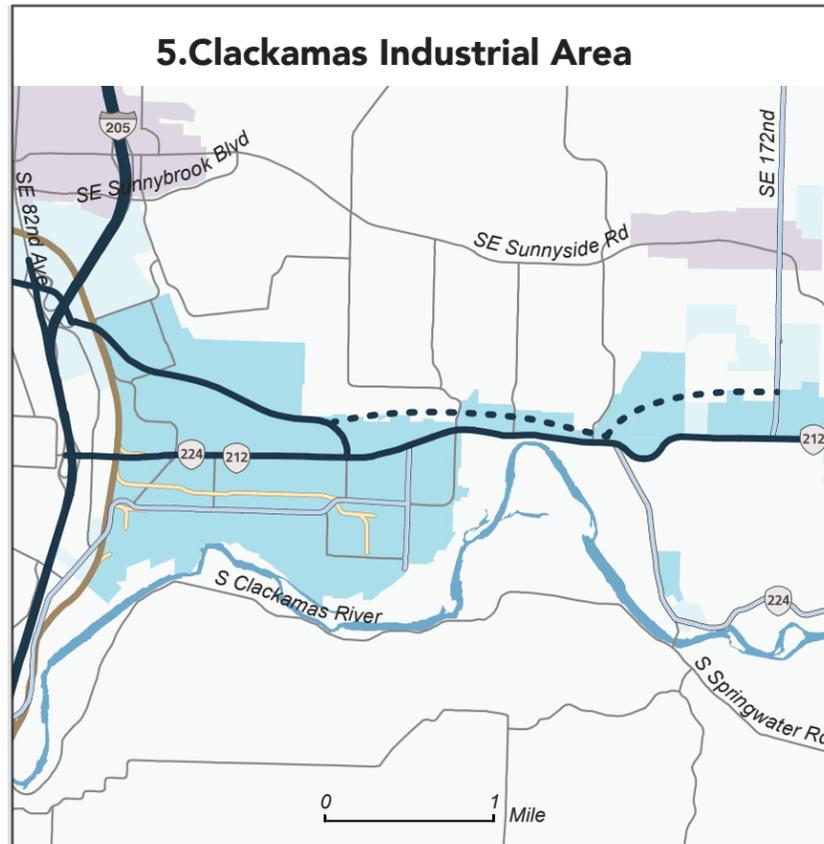
3. Portland International Airport + Air freight



4. Kenton Rail Line / Columbia Corridor



5. Clackamas Industrial Area



6. Beaverton Industrial + Branch Rail Lines



Legend

(dotted lines indicate planned projects, and do not identify specific alignments)

- Main rail lines
- Branch rail lines
- Main roadway routes
- Roadway connectors
- Regional intermodal connectors
- Marine facilities
- Rail Yards
- Employment
- Industry
- Urban Centers
- Urban Growth Boundary
- County Boundaries
- Airports

3.8 REGIONAL ACTIVE TRANSPORTATION NETWORK VISION

A complete and welcoming active transportation network allows people of all ages, abilities, income levels and backgrounds to access transit, walk and bike easily and safely for many of their daily needs. The Regional Active Transportation Network vision was developed in the Regional Active Transportation Plan and starts with the understanding that integrated, complete and seamless regional pedestrian, bicycle and transit networks are necessary to achieve local and regional transportation goals, aspirations and targets.

Active transportation is human-powered transportation that engages people in healthy physical activity while they travel from place to place. People walking, bicycling, the use of strollers, wheelchairs /mobility devices, skateboarding, and rollerblading are active transportation.

Active transportation supports public transportation because most trips on public transportation include walking or bicycling.

3.8.1 Regional Active Transportation Network Vision

Many people in the region incorporate walking, transit and riding a bicycle into daily travel. The regional active transportation network concept focuses on the integration of bicycle, pedestrian and transit travel and connecting local pedestrian and bicycle networks into a coordinated and complete regional network.

The regional active transportation network is composed of pedestrian-bicycle districts and regional bikeways and walkways that connect to and serve high capacity and frequent transit. Pedestrian-bicycle districts are urban centers and station communities. The following ten guiding principles were developed in the Regional Active Transportation Plan to guide development of the regional active transportation network.

1. Bicycling, walking, and transit routes are integrated and connections to regional centers and regional destinations are seamless.
2. Routes are direct, form a complete network, are intuitive and easy-to-use and are accessible at all times.
3. Routes are safe and comfortable for people of all ages and abilities and welcoming to people of all income levels and backgrounds.
4. Routes are attractive and travel is enjoyable.
5. Routes are integrated with nature and designed in a habitat and environmentally-sensitive manner.
6. Facility designs are context sensitive and seek to improve safety and balance the needs of all transportation modes.
7. Increases corridor capacity and relieves strain on other transportation systems.

8. Ensures access to regional destinations for people with low incomes, people of color, people living with disabilities, people with low-English-proficiency, youth and seniors.
9. Measurable data and analyses inform the development of the network and active transportation policies.
10. Implements regional and local land use and transportation goals and plans to achieve regional active transportation modal targets.

Developing the regional active transportation network according to the guiding principles will provide a well-connected network of complete streets and off-street paths integrated with transit and prioritizing safe, convenient and comfortable pedestrian and bicycle access for all ages and abilities. This will help make walking and bicycling the most convenient and enjoyable transportation choices for short trips and provide access to regional destinations, jobs, regional and town centers, schools, parks and essential daily services. It will also increase walking and bicycling access for underserved populations and ensures that the regional active transportation network equitably serves all people.¹⁴

Note: A schematic will be added to the final RTP that shows how pedestrian, bicycle and transit work together.

¹⁴ Underserved populations include low income, low-English proficiency, minority, senior (over 65) and youth (under 18).

3.9 REGIONAL BICYCLE NETWORK CONCEPT AND POLICIES

Residents in the region have long recognized bicycling as an important form of transportation. The RTP elevates the importance of supporting bicycle travel because of the mobility, economic, environmental, health, and land use benefits it provides.

Sidewalks, trails, bicycle facilities and transit cannot achieve their full potential if they are treated as stand-alone facilities – they must be planned and developed as part of a complete network.



Bicycle travel is an important mode that supports regional goals for mobility, public health and the environment.

Section 3.08.140 of the Regional Transportation Functional Plan requires that local jurisdictions include a bicycle plan to achieve the following:

- an inventory of existing facilities that identifies gaps and deficiencies in the bicycle system;
- an evaluation of needs for bicycle access to transit and essential destinations, including direct, comfortable and safe bicycle routes and secure bicycle parking;
- a list of improvements to the bicycle system;
- provision for bikeways along arterials, collectors and local streets, and bicycle parking in centers, at major transit stops, park-and-ride lots and institutional uses; and
- provision for safe crossing of streets and controlled bicycle crossing on major arterials.

3.9.1 Regional Bicycle Network Concept

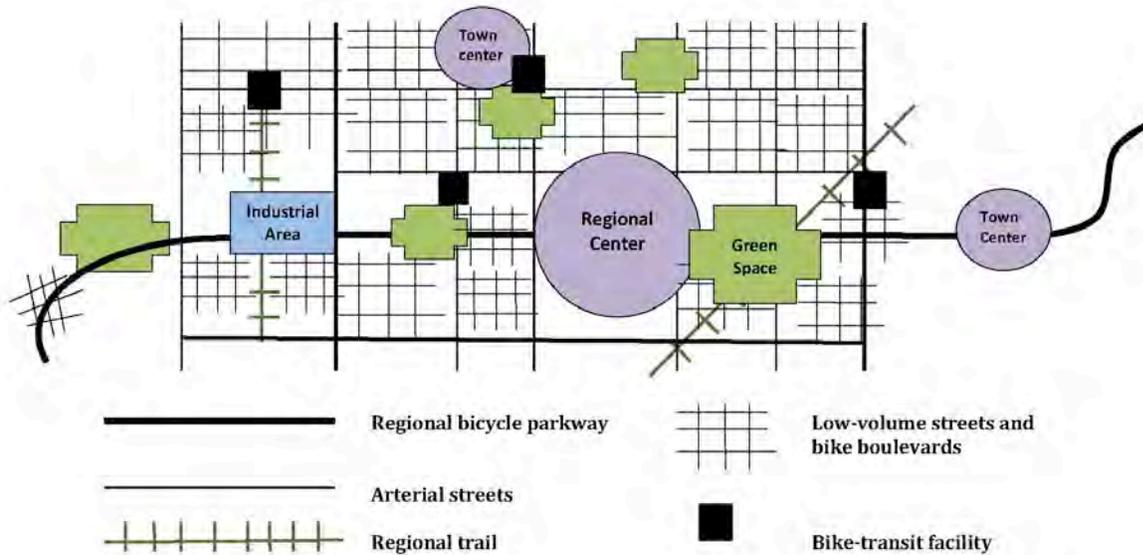
The regional bicycle network concept includes:

- A bicycle parkway in each of the region's Mobility Corridors within the MPA boundary to provide transportation options in these corridors.
- A network of bicycle parkways, spaced approximately every two miles, that connect to and/or through every town and regional center, many regional destinations and to most employment and industrial land areas and regional parks and natural areas (all areas are connected by regional bikeways, the next functional class of bicycle routes).
- A network of regional bikeways that connect to the bicycle parkways, providing an interconnected regional network. Local bikeways connect to bicycle parkways and regional bikeways.

- Regional bicycle districts. Regional and town centers and station communities were identified as bicycle districts, as well as pedestrian districts.

Figure 3.28 shows the components of the regional bicycle network concept and their relationship to adjacent land uses. A region-wide bicycle network would be made up of on-street and off-street routes with connections to transit and other destinations.

Figure 3.28 Regional Bicycle Network Concept



The Region 2040 plan sets forth a vision for making bicycling safe, convenient and enjoyable, and to support bicycling as a legitimate travel choice for all people in the region. The RTP supports this vision with a region-wide network of bicycle districts and on-street and off-street bikeways integrated with transit.

3.9.2 Regional Bicycle Network Policies

This section describes the policy framework of the Regional Bicycle Network Concept. Specific actions that Metro, in partnership with cities, counties, agencies and other stakeholders can take to implement the policies are identified in the Regional Active Transportation Plan.

Regional Bicycle Policies	
Policy 1	Make bicycling the most convenient, safe and enjoyable transportation choices for short trips of less than three miles
Policy 2	Complete an interconnected regional network of bicycle routes and districts that is integrated with transit and nature and prioritizes seamless, safe, convenient and comfortable access to urban centers and community places, including schools and jobs, for all ages and abilities.
Policy 3	Complete a green ribbon of bicycle parkways as part of the region's integrated mobility strategy.
Policy 4	Improve bike access to transit and community places for people of all ages and abilities.
Policy 5	Ensure that the regional bicycle network equitably serves all people.

Bicycle Policy 1. Make bicycling the most convenient, safe and enjoyable transportation choices for short trips less than three miles.

The average length of a bicycle trip in the region is about three miles.¹⁵ Nearly 45 percent of all trips made by car in the region are less than three miles, and 15 percent are less than one mile.¹⁶ With complete networks, education, encouragement and other programs, many short trips made by car could be replaced with bicycle or pedestrian trips, increasing road capacity and reducing the need to expand the road system. Emerging technologies such as bike-sharing provide a new toolkit to make bicycling even easier for short trips.

In 2011, the Federal Transit Administration (FTA) established a formal policy on the eligibility of pedestrian and bicycle improvements for FTA funding and defined the catchment area for pedestrians and bicyclists in relation to public transportation stops and stations. The policy recognized that bicycle and pedestrian access to transit is critical,

¹⁵ 2011 Oregon Household Activity Survey.

¹⁶ 2011 Oregon Household Activity Survey. Vehicle trips by length for trips wholly within Clackamas, Multnomah, Washington and Clark Counties.

and defined a three mile catchment area for bicycle improvements and a half mile catchment area for pedestrian improvements.¹⁷

Bicycle travel holds huge potential for providing transportation options that can replace trips made by auto, especially for short trips. Bicycle trips made in the region for all purposes grew by 190% since 1995.¹⁸ When bicycling is safe, comfortable, convenient and enjoyable, people have the option of making some of those short trips by bicycle.

Bicycle Policy 2. Complete an interconnected regional network of bicycle routes and districts that is integrated with transit and nature and prioritizes seamless, safe, convenient and comfortable access to urban centers and community places, including schools and jobs for all ages and abilities.

A well-connected bicycle network does not have gaps and is comfortable and safe for people of all ages and abilities. Regional bicycle routes connect to and through urban centers to increasing access to transit, businesses, schools, and other destinations. Regional trails and transit function better when they are integrated with on-street bicycle routes. Wherever possible, routes should connect to and through nature and include trees and other green elements. Designing the network for universal access will make the regional bicycle network accessible and comfortable for all ages and abilities. The Regional Transportation Functional plan requires local Transportation System Plans include an interconnected network of bicycle routes.

Bicycle Policy 3. Complete a green ribbon of bicycle parkways as part of the region's mobility strategy.

Regional bicycle parkways form the backbone of the regional bicycle system, connecting to 2040 activity centers, downtowns, institutions and greenspaces within the urban area while providing an opportunity for bicyclists to travel efficiently with minimal delays. In effect, the bicycle parkway concept mainstreams bicycle travel as an important part of the region's integrated mobility strategy. This concept emerged from work by the Metro Blue Ribbon Committee for Trails as part of the broader Connecting Green Initiative in 2007-09 and further developed in the Regional Active Transportation Plan adopted in 2014.

Key experiential aspects that bike parkways embody:

- A green environment with natural features such as trees or plantings (some will already be green, while others will be made greener as part of bike parkway development)
- Comfort and safety provided by protection from motorized traffic

¹⁷ Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements Under Federal Transit Law

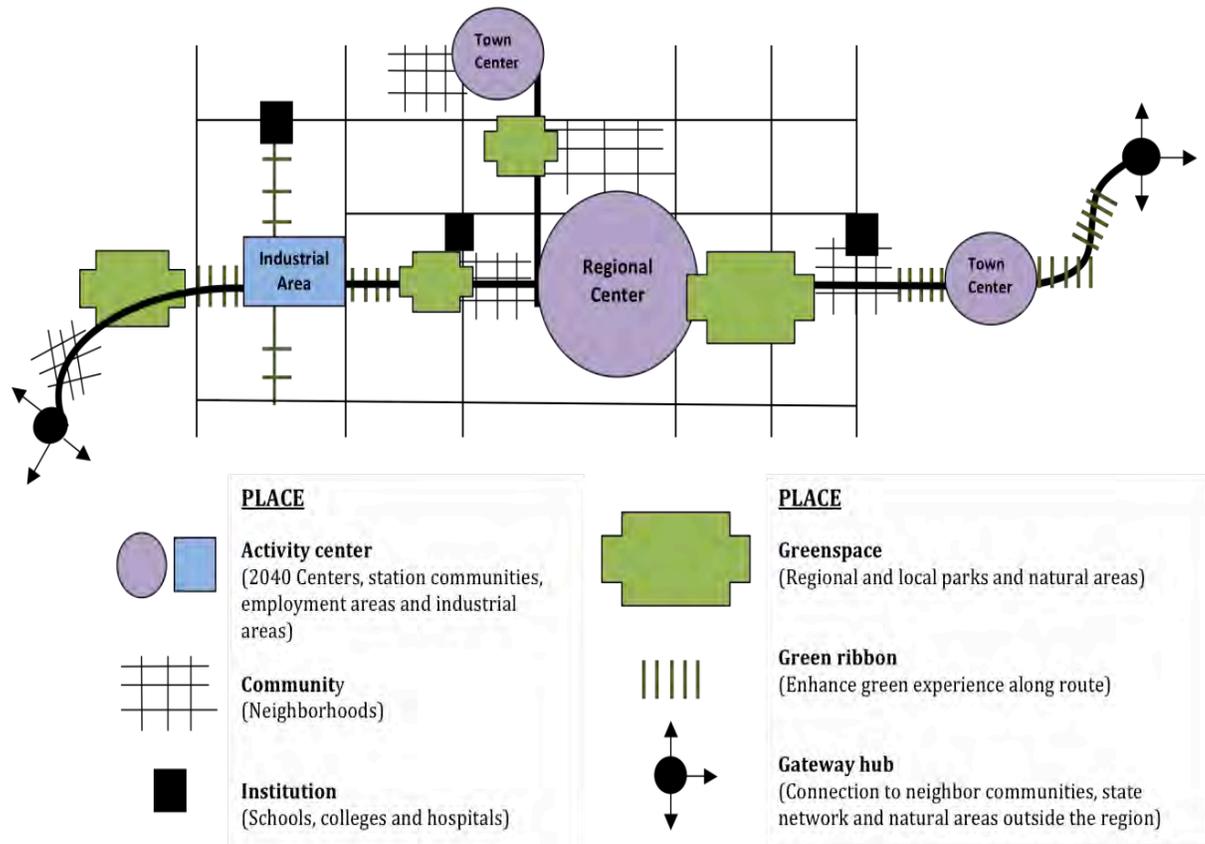
¹⁸ 2011 Oregon Household Activity Survey.

- Large volumes of cyclists traveling efficiently with minimal delays

The bicycle parkway also connects the region to neighboring communities, other statewide trails and natural destinations such as Mt Hood, the Columbia River Gorge, and the Pacific Ocean.

Figure 3.29 illustrates this policy concept in the context of the regional bicycle parkway concept.

Figure 3.29 Bicycle Parkway Concept



A bicycle parkway serves as a green ribbon connecting 2040 activity centers, downtowns, institutions and greenspaces within the urban area.

The experience of the cyclist will be optimized to such a high level that people will clearly know when they are riding on a bicycle parkway. The specific design of a bike parkway will vary depending on the land use context within which it passes through. The facility could be designed as an off-street trail along a stream or rail corridor, a cycle track along a main street or town center, or a bicycle boulevard through a residential neighborhood. Priority treatments will be given to cyclists (e.g., signal timing) using the bike parkway when they intersect other transportation facilities, and connections to/from other types of

bicycle routes will be intuitive. The Regional Active Transportation Plan provides design guidance on the development of bicycle parkways.

Bicycle Policy 4. Improve bike access to transit and to community places for people of all ages and abilities.

Public transit and bicycling are complementary travel modes. Effectively linking bicycling with transit increases the reach of both modes. It allows longer trips to be made without driving and reduces the need to provide auto park-and-ride lots at transit stations.

Transit provides a fast and comfortable travel environment between regional destinations that overcomes barriers to bicycling (hills, distance, and streets without bikeways); while bicycling provides access from the front door to a transit station, is faster than walking and can sometimes eliminate the need to transfer between transit vehicles.

A key component of the bike-transit connection is bicycle parking at transit stations and stops. Bike-Transit facilities provide connections between modes by creating a “bicycle park and ride.” Both TriMet and SMART currently provide bicycle parking and storage at many transit stations and stops. TriMet, with input from regional stakeholders, has developed Bicycle Parking Guidelines. The guidelines consider station context and regional travel patterns, and are focused on three major factors for parking: location, amount and design. The guidelines will help TriMet and local jurisdictions determine the appropriate location, size and design of large-scale bike-parking facilities, including Bike-Transit Facilities. The Regional Transportation Functional Plan requires that local transportation system plans evaluate the needs for bicycle access to transit, including secure bicycle parking.

Bicycle Policy 5. Ensure that the regional bicycle network equitably serves all people.

All people in the region, regardless of race, income level, age or ability should enjoy access to complete and safe walking, bicycling and transit networks and the access they provide to essential destinations, including schools and jobs. Currently the regional active transportation network is incomplete in many areas of the region, including areas with low-income, minority and low-English proficiency populations. Transportation is the second highest household expense for the average American; providing transportation options in areas with low-income populations helps address transportation inequities. Future planning, design and construction of the networks must include consideration of the benefits and burdens of transportation investments to underserved and environmental justice populations. In addition to infrastructure, new technologies such as bike sharing increase opportunities for all residents to bicycle. In Portland, the “Biketown for All” program provides discounted memberships, free helmets and bike safety education to low-income people.



The region's bicycle network supports a variety of facilities to make bicycling safe, direct and enjoyable.

3.9.3 Regional Bicycle Network Functional Classifications and Map

This section describes the regional bicycle network functional classifications shown on **Figure 3.30**, the Regional Bicycle Network. The regional bicycle network is composed of on-street and off-street bikeways that serve the central city, regional centers, town centers, and other 2040 Target Areas, providing a continuous network that spans jurisdictional boundaries.

Figure 3.30 is a functional map illustrating how regional bicycle routes and districts work together to form a comprehensive network that would allow people to bike to transit, schools, employment centers, parks, natural areas and shopping. (See <http://gis.oregonmetro.gov/RTP/> for zoomable version.)

The regional bicycle network has a functional hierarchy similar to that of the regional motor vehicle network. **Figure 3.30** provides a vision for a future bicycle network; for a map of current bicycle facilities in the region, refer to Chapter 1.

The different functional elements of the regional bicycle network are:

- **Regional Bicycle Parkways** are spaced approximately every two miles in a spiderweb-grid pattern, and connect to and through every urban center, many regional destinations and to most employment and industrial land areas, regional parks and natural areas. Each Mobility Corridor within the urban area has an identified bicycle parkway. Bicycle parkways were identified as routes that currently serve or will serve higher



The Eastbank Esplanade, along the Willamette River, is an example of how regional trails serve recreational and commuter travel needs.

volumes of bicyclists and provide important connections to destinations.

- **Regional Bikeways** provide for travel to and within the Central City, Regional Centers, and Town Centers. Regional bikeways can be any type of facility, including off-street trails/multi-use paths, separated in-street bikeways (such as buffered bicycle lanes) and bicycle boulevards. On-street Regional Bikeways located on arterial and collector streets are designed to provide separation from traffic.
- **Local Bikeways** are not identified as regional routes. However, they are very important to a fully functioning network. They are typically shorter routes with less bicycle demand and use than regional routes. They provide for door to door bicycle travel.
- **Bicycle Districts (and Pedestrian Districts)** include the Portland Central City, Regional and Town Centers and Station Communities. A bicycle district is an area with a concentration of transit, commercial, cultural, educational, institutional and/or recreational destinations where bicycle travel is intended to be attractive, comfortable and safe. Bicycle districts are also areas with current or planned high levels of bicycle activity. All bicycle routes within bicycle districts are considered regional and are eligible for federal funding. Bicycle facilities in bicycle districts should strive to be developed consistent with the design guidance described in Chapter 9.

Which areas are designated as bicycle districts should be considered further in future Regional Transportation Plan and ATP updates. For example, areas around bus stops with high ridership should be evaluated as potential bicycle districts (light rail station areas are currently identified as bicycle districts); some Main Streets on the regional network may be considered for expansion as bicycle districts, as well as other areas

- **Bike-Transit Facilities** are often referred to as Bike & Rides and are generally located at transit centers and stations and provide secure, protected large-scale bike parking facilities. Some facilities may include additional features such as showers, lockers, trip planning and bicycle repair. In addition to existing bike and ride facilities at Wilsonville (SMART), Hillsboro, Beaverton Transit Center, Sunset Transit Center and Gresham Transit Center, TriMet is working in partnership with city and county jurisdictions to apply for funding to build additional bike and rides with current planning focusing on enhanced bike parking facilities in areas such as Gateway Transit Center in East Portland, Orenco/NW 231st Ave. in Hillsboro, Beaverton Creek in Beaverton, Goose Hollow in Portland and Park Ave. and Tacoma stations as part of the Portland-Milwaukie light rail line.

Bicycle Parkways and Regional Bikeways typically follow arterial streets but may also be located on collector and low-volume streets. On-street bikeways should be designed using a flexible “toolbox” of bikeway designs, including bike lanes, cycle tracks (physically separated bicycle lanes) shoulder bikeways, shared roadway/wide outside lanes and bicycle priority treatments (e.g. bicycle boulevards).

Regional Active Transportation Plan (2014)

The Regional Active Transportation Plan provides recommended design guidance for trails/multi-use paths, and low volume and high volume streets. The appropriateness of each design is based on adjacent motor vehicle speeds and volumes. It may be difficult on some arterial streets at present to provide a comfortable facility. The RTP expects that these routes will eventually improve for bicycling, through better designs and lower auto speeds accompanying a more compact urban form. In the short-term the RTP recognizes the need to continue to build ridership through providing low-volume routes for bicycle travel in the region.

Arterial streets provide direct routes that connect to 2040 Target Areas. Cyclists tend to travel on arterial streets when they want to minimize travel time or access destinations along them. Oregon State statutes and administrative rules establish that bicycle facilities are required on all collector and higher classification arterial streets when those roads are constructed or reconstructed.

Low-volume streets often provide access to 2040 Target Areas as well as residential neighborhoods, complementing bicycle facilities located on arterial streets. Though these routes are often less direct than arterials, attributes such as slower speeds and less noise, exhaust and interaction with vehicles, including trucks and buses, can make them more comfortable and appealing to many cyclists. Recent research suggests that providing facilities on low-volume streets may be a particularly effective strategy for encouraging new bicyclists, which helps increase bicycle mode share in the region.

Regional trails typically provide an environment removed from vehicle traffic and function as an important part of the larger park and open space system in a community and in the region. Trails often take advantage of opportunities for users to experience natural features such as creeks, rivers, forests, open spaces and wildlife habitats, as well as historic and cultural features, with viewpoints and interpretive opportunities. In high use areas, regional trails should be designed to provide separation between bicyclists and pedestrians.

Off-street facilities also complement on-street bikeways, providing access to 2040 Target Areas while providing a travel environment with fewer intersecting streets than on-street bikeways, thereby allowing for faster travel times. This makes off-street facilities especially attractive for serving long distance bicycle trips. Similar to low-volume streets,



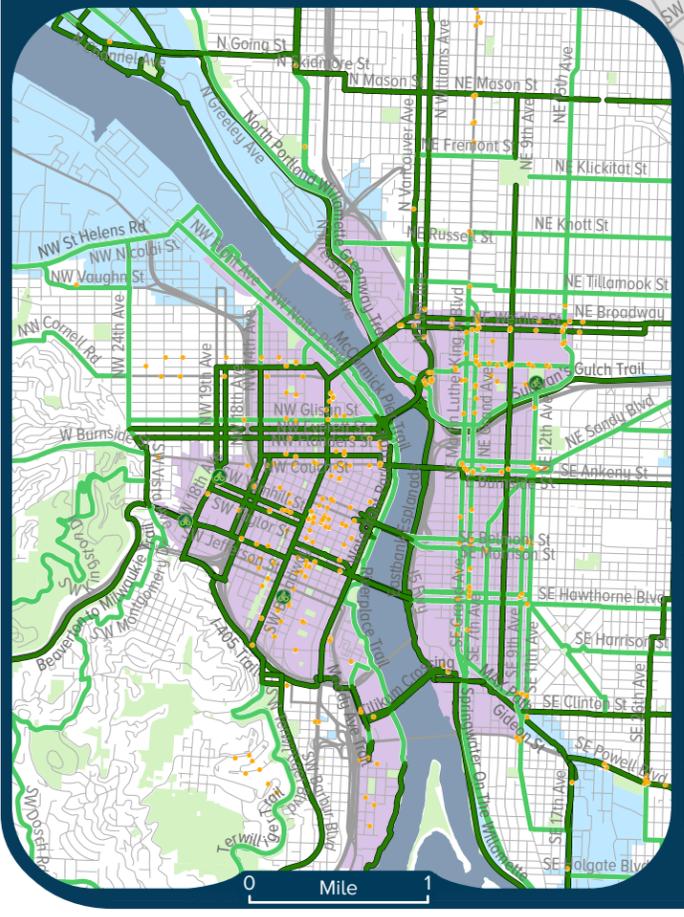
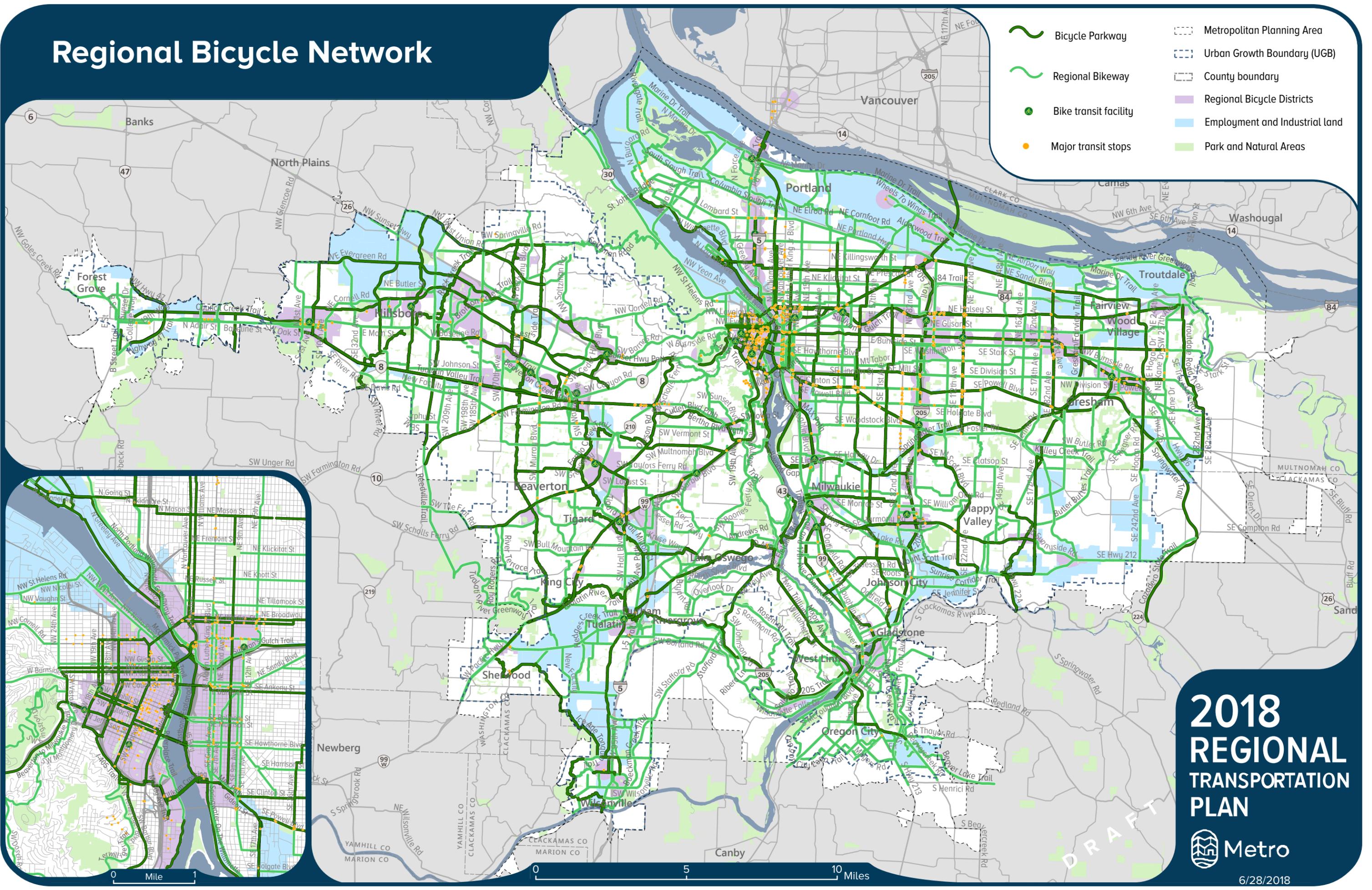
Higher use trails can be designed to provide separation between bicyclists and pedestrians in order to avoid conflicts. Some trails that have been designed to minimum width requirements will need retrofits as more people use them.

off-street facilities provide an environment more removed from vehicle traffic, which is appealing to families and new or less confident cyclists.

Figure 3.30 Regional Bicycle Network Map

Regional Bicycle Network

-  Bicycle Parkway
-  Regional Bikeway
-  Bike transit facility
-  Major transit stops
-  Metropolitan Planning Area
-  Urban Growth Boundary (UGB)
-  County boundary
-  Regional Bicycle Districts
-  Employment and Industrial land
-  Park and Natural Areas



**2018
REGIONAL
TRANSPORTATION
PLAN**

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3.10 REGIONAL PEDESTRIAN NETWORK CONCEPT AND POLICIES

Walking contributes to a healthy lifestyle and supports vibrant local economies. Every trip begins or ends with at least a short walk. Transit in particular is integrated with walking. However, while everyone walks, walking is not a safe or convenient option for everyone in the region. Traffic crashes involving people walking often end in a death or severe injury and pedestrian deaths are rising.

Many streets are not ADA-compliant, sidewalk gaps remain on busy arterial roadways and along bus routes, safe place to cross the street can be few and far between, lack of street lighting, and other gaps make it dangerous and difficult to walk, especially for older adults, children and people with disabilities. In historically marginalized communities lack of safe walking routes can be worse.

In the Regional Pedestrian Network Vision walking is safe and convenient. Section 3.08.130 of the Regional Transportation Functional Plan requires that local jurisdictions include a pedestrian plan to achieve the following:

- Sidewalks along all arterials, collectors and most local streets.
- Direct and safe pedestrian routes to transit and other essential destinations.
- Safe pedestrian crossings of busy streets and controlled pedestrian crossings on major arterials provided at regular intervals following regional connectivity standards (street crossings spaced no more than 530 feet apart—an ideal spacing is 200 to 400 feet where possible (unless there are no intersections, bus stops or other pedestrian attractions)).
- Safe, direct and logical pedestrian crossings at all transit stops where practicable.
- Crossings over barriers such as throughways, active rail-lines and rivers provided at regular intervals following regional connectivity standards.
- Regional multi-use trails and walking paths are completed.



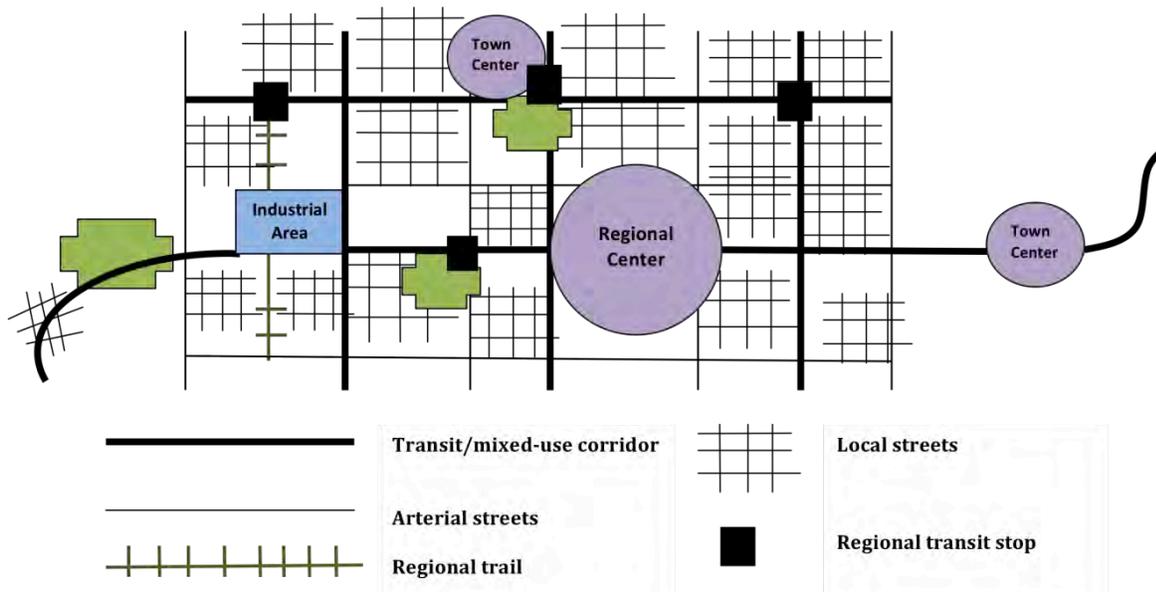
Walkability plays an important role in economic development by supporting commercial activity in centers. The RTP considers walking and bicycling equal with other transportation modes, and prioritizes short walking and bicycling trips.

3.10.1 Regional Pedestrian Network Concept

The Regional Pedestrian Network Concept describes a well-connected grid of streets and multi-use paths connecting to and intersecting through regional and town centers, employment areas, station communities, parks and natural areas and connecting to transit and essential destinations.

Figure 3.31 shows the components of the regional pedestrian network and their relationship to adjacent land uses.

Figure 3.31 Regional Pedestrian Network Concept



The 2040 Growth Concept sets forth a vision for making walking safe, convenient and enjoyable to support walking as a legitimate travel choice for all people in the region. The Regional Transportation Plan supports this vision with a region-wide network of on-street and off-street pedestrian facilities integrated with transit and regional destinations.

3.10.2 Regional Pedestrian Network Policies

Regional pedestrian policies help achieve the Regional Pedestrian Network Vision. Specific actions that Metro, in partnership with cities, counties, agencies and other stakeholders, can take to implement the policies are identified in the Regional Active Transportation Plan.

Regional Pedestrian Network Policies

- Policy 1.** Make walking the most convenient, safe and enjoyable transportation choices for short trips less than one mile.
- Policy 2.** Complete a well-connected network of pedestrian routes and safe street crossings that is integrated with transit and nature that prioritize seamless, safe, convenient and comfortable access to urban centers and community places, including schools and jobs, for all ages and abilities.
- Policy 3.** Create walkable downtowns, centers, main streets and station communities that prioritize safe, convenient and comfortable pedestrian access for all ages and abilities.
- Policy 4.** Improve pedestrian access to transit and community places for people

Pedestrian Policy 1. Make walking the most convenient, safe and enjoyable transportation choices for short trips less than one mile.

The average length of a walking trip in the region is about half a mile. Today 15% of trips made in an auto are less than one mile.¹⁹ Many of these trips could be made by walking if it were convenient, safe and enjoyable. Fully implementing regional and local plans will help make this possible.

In 2011, the Federal Transit Administration (FTA) established a formal policy on the eligibility of pedestrian and bicycle improvements for FTA funding and defined the catchment area for pedestrians and bicyclists in relation to public transportation stops and stations. The policy recognized that bicycle and pedestrian access to transit is critical, and defined a three mile catchment area for bicycle improvements and a half mile catchment area for pedestrian improvements.²⁰

Ensuring all gaps and deficiencies on the regional pedestrian network have projects identified in the Regional Transportation Plan and including wayfinding, street markings,

¹⁹ 2011 Oregon Household Activity Survey.

²⁰ Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements Under Federal Transit Law

lighting and other elements that enhance connections and make the pedestrian network consistent, integrated and easy to navigate are key elements to implementing this policy. The Regional Transportation Functional Plan includes specific requirements in the Pedestrian and Transit System Design sections.

Pedestrian Policy 2. Complete a well-connected network of pedestrian routes, including safe street crossings, integrated with transit and nature that prioritize seamless, safe, convenient and comfortable access to urban centers and community places, including schools and jobs, for all ages and abilities.

A well-connected high-quality pedestrian environment facilitates walking trips by providing safe and convenient access to essential destinations. The Regional Pedestrian Network provides the plan for well-connected pedestrian routes and safe street crossings to provide access to transit and essential daily needs. The Regional Transportation Functional Plan requires that local Transportation System Plans include an interconnected network of pedestrian routes.

Section 3.08.130 of the Regional Transportation Functional Plan includes the requirements to provide a well-connected pedestrian system, and Oregon State statutes and administrative rules establish that pedestrian facilities are required on all collector and higher classification streets when those roads are built or reconstructed. (Exceptions are provided where cost is excessively disproportionate to need or where there is an absence of need due to sparse population or other factors.)

Priority should be given to filling gaps and providing safe crossings of the busiest streets with transit and other essential destinations. Deficient facilities in areas of high walking demand are considered gaps.

Pedestrian Policy 3. Create walkable downtowns, centers, main streets and station communities that prioritize safe, convenient and comfortable pedestrian access for all ages and abilities.

All centers and station areas are Regional Pedestrian Districts. The central city, regional and town centers, main streets and light rail station communities are areas high levels of pedestrian activity are prioritized. In these areas, sidewalks, plazas and other public spaces are integrated with civic, commercial and residential development. They are often characterized by compact mixed-use development served by transit. These areas are defined as pedestrian districts in the RTP.

Walkable areas should be designed to reflect an urban development and design pattern where walking is safe, convenient and enjoyable. These areas are characterized by buildings oriented to the street and boulevard-type street design features, such as wide sidewalks with buffering from adjacent motor vehicle traffic, marked street crossings at all intersections with special crossing amenities at some locations, special lighting, benches, bus shelters, awnings and street trees. All streets within these areas are important pedestrian connections. Sections 3.08.120 (B) (2) and 3.08.130 (B) list requirements for pedestrian districts and new development near transit.

Pedestrian Policy 4. Improve pedestrian access to transit and community places for people of all ages and abilities.

Public transportation use is fully realized only with safe and convenient pedestrian and bicycle connections, especially safe crossings and facilities that connect stations or bus stops to surrounding areas or that provide safe and attractive waiting areas. Improving walkway connections between office and commercial districts and surrounding neighborhoods provides opportunities for residents to walk to work, shopping or to run personal errands. Buildings need to be oriented to the street and be well connected to sidewalks. Safe routes across parking lots need to be provided. This reduces the need to bring an automobile to work and enhances public transportation and carpooling as commute options. The Regional Transportation Functional Plan requires that local Transportation System Plans include an evaluation of needs for pedestrian access to transit for all mobility levels, including direct, comfortable and safe pedestrian routes.

The experience of people walking and pedestrian access along transit-mixed use corridors is improved with features such as wide sidewalks with buffering from adjacent motor vehicle traffic, street crossings spaced no more than 530 feet apart—an ideal spacing is 200 to 400 feet where possible (unless there are no intersections, bus stops or other pedestrian attractions), special crossing elements at some locations, special lighting, benches, bus shelters, awnings and street trees.

Pedestrian Policy 5. Ensure that the regional pedestrian network equitably serves all people.

All people in the region, regardless of race, income level, age or ability should enjoy access to the region’s walking and transit networks and the access they provide to essential destinations, including schools and jobs. Currently the regional pedestrian network is incomplete in many areas of the region, including areas where people with low-incomes, people of color and people language isolation live. Transportation is the second highest



NW 23rd in Portland is an example of a lively pedestrian district.

household expense for the average American; providing transportation options in areas with low-income populations helps address transportation inequities.

Section 3.08.120[C] of the Regional Transportation Functional Plan specifies that the needs of youth, seniors, people with disabilities and environmental justice populations including people of color and people with low-incomes must be considered when planning transit.

Regional and local planning, design and construction of the networks must include consideration of the benefits and burdens of transportation investments to underserved and environmental justice populations, and continue to collect data and monitor performance in accordance with section 3.08.010 of the Regional Transportation Functional Plan.

Investment programs should set priorities for sidewalk improvements to and along major transit routes and communities where physically or economically disadvantaged populations live.

3.10.3 Regional Pedestrian Network Classifications and Map

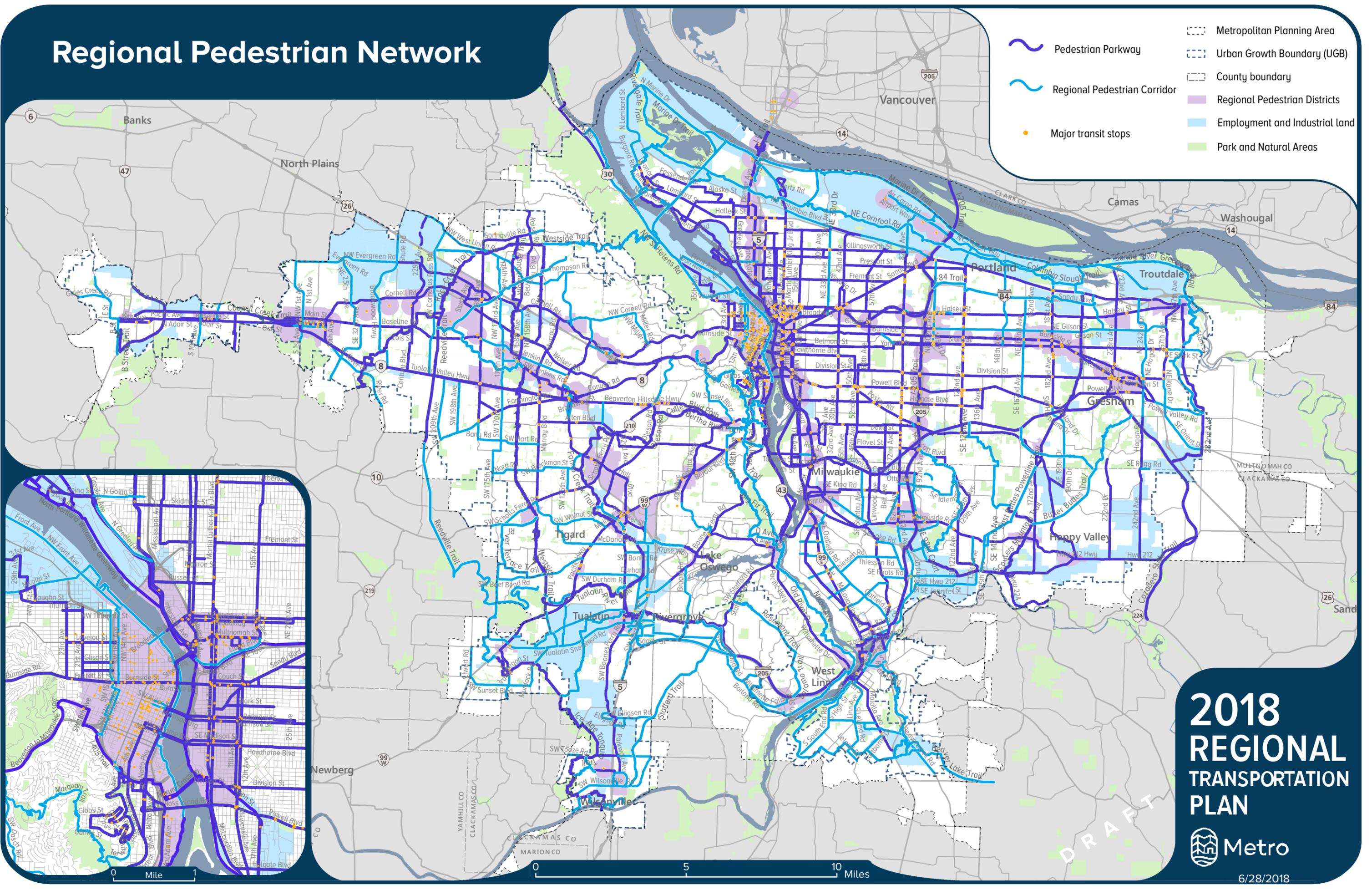
This section describes the regional pedestrian network functional classifications shown on **Figure 3.32**, the Regional Pedestrian Network. The regional pedestrian network mirrors the regional transit network reflecting the important relationship of a complete walking network and transit. Frequent transit routes and regional arterials comprise regional pedestrian streets. Regional trails are also part of the regional pedestrian network. Centers and station areas are regional pedestrian districts, and include all streets of all functional classifications and paths within their boundaries.

The regional pedestrian network has a functional hierarchy similar to that of the regional motor vehicle network. **Figure 3.32** provides a vision for a future pedestrian network; for a map of existing pedestrian facilities in the region, refer to Chapter 4.

Figure 3.32 Regional Pedestrian Network Map

Regional Pedestrian Network

-  Metropolitan Planning Area
-  Urban Growth Boundary (UGB)
-  County boundary
-  Regional Pedestrian Districts
-  Employment and Industrial land
-  Park and Natural Areas
-  Pedestrian Parkway
-  Regional Pedestrian Corridor
-  Major transit stops



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The different functional elements of the regional pedestrian network are:

- **Pedestrian Parkways** are generally major urban streets that provide frequent and almost frequent transit service (existing and planned). They can also be regional trails.
- **Regional Pedestrian Corridors** are any major or minor arterial on the regional urban arterial network that is not a Pedestrian Parkway. Regional trails that are not Pedestrian Parkways are classified as Regional Pedestrian Corridors.
- **Local Pedestrian Connectors** are all streets and trails not included on the Regional Pedestrian Network.
- **Pedestrian Districts** are the Central City, Regional and Town Centers and Station Communities shown on the Regional Pedestrian Network Map. A pedestrian district is an area with a concentration of transit, commercial, cultural, institutional and/or recreational destinations where pedestrian travel is attractive, comfortable and safe. Pedestrian Districts are areas where high levels of walking exist or are planned. All streets and trails within the Pedestrian District are part of the regional system.

Figure 3.32 on the previous pages applies the regional pedestrian network concept on the ground, illustrating how different regional pedestrian facilities work together to form a comprehensive network that would allow people to walk to transit, schools, employment centers, parks, natural areas and shopping. (See <http://gis.oregonmetro.gov/RTP/> for zoomable version.

3.11 TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS VISION AND POLICIES

The region's Transportation System Management and Operations (TSMO) policies reflect that the transportation system represents a significant public investment in capital infrastructure that must be protected and well-managed. Concerns about the social, environmental and financial cost of larger-scale capital projects, such as building new lanes, lend support for first managing the current system. Management can restore reliable travel and provide flexibility for travelers to use a variety of travel options.

TSMO is a set of integrated transportation strategies and solutions Through a combination of transportation system management (TSM), coordinated response from transportation operators and transportation demand management (TDM) services and projects, The TSM component typically incorporates advanced technologies to improve traffic operations. TDM promotes travel options and ongoing programs that result in reduced demand for drive-alone trips. Together these two transportation management techniques optimize the existing transportation infrastructure to help achieve multiple regional transportation goals.

3.11.1 Transportation System Management and Operations Concept

Through the RTP and supporting strategies, such regional TSMO Strategy, the region aims to be a nationally recognized leader for innovative management and operations of its system to:

- Improve safety and travel time reliability
- Improve transit on-time arrival and speeds
- Reduce travel delay
- Decrease vehicle miles traveled and drive alone trips
- Reduce fuel use and corresponding air pollution and greenhouse gas emissions

Table 3.9 provides examples of TSMO strategies for each of the investment areas.

Table 3.33 Examples of TSMO investments

Multimodal Traffic Management

- Traffic signal coordination
- Transit signal priority treatment
- Detection and countdown timers for bicycles and pedestrians

Traveler Information

- Real-time traveler information for freeways, arterials and transit
- Enhanced multi-modal traveler information tools on mobile devices

Traffic Incident Management

- Add and coordinate traffic cameras and other sensors
- Expand incident management teams and training

Transportation Demand Management

- Carpooling and vanpooling
- Collaborative marketing (e.g., development and coordination of regional messaging)
- Individualized marketing (e.g. SmartTrips program)
- Employer outreach
- Wayfinding guidance for bicycling and walking

3.11.2 Transportation System Management and Operations Policies

Transportation System Management and Operations Policies

- Policy 1** Expand use of pricing strategies to manage travel demand on the transportation system.
- Policy 2** Expand use of access management, advanced technologies, and other tools to actively manage the transportation system.
- Policy 3** Provide comprehensive, integrated, universally accessible and real-time travel information to people and businesses.
- Policy 4** Improve incident detection and clearance times on the region’s transit, motor vehicle networks to reduce the impact of crashes on the transportation system.
- Policy 5** Expand commuter programs, individualized marketing efforts and other tools throughout the region to increase awareness and use of travel options.
- Policy 6** Build public, non-profit and private sector capacity throughout the region to promote travel options.
- Policy 7** Manage parking in mixed-use centers and corridors served by frequent transit service and good biking and walking connections to reduce the amount of land dedicated to parking, encourage parking turnover, increase shared trips, biking, walking and use of transit, reduce vehicle miles traveled and generate revenue..

TSMO Policy 1. Expand use of pricing strategies to manage travel demand on the transportation system.

Value pricing—sometimes called congestion pricing —involves the application of market pricing (through variable tolls, variable priced lanes, area-wide charges or cordon charges) to the use of roadways at different times of day. While this tool has been successfully applied in other parts of the U.S. and internationally, it has not been applied in the Portland metropolitan region to date.

As applied elsewhere, this strategy manages peak use on limited roadway infrastructure by providing an incentive for drivers to select other modes, routes, destinations or times of day for their travels. Reducing discretionary peak hour travel helps the system operate more efficiently improving mobility and reliability of the transportation system while limiting vehicle miles traveled and congestion-related auto emissions. In addition, those drivers who choose to pay tolls can benefit from significant savings in time. Similar variable charges have been utilized for pricing airline tickets, telephone rates and electricity rates to allocate resources during peak usage. In addition, value pricing may

generate revenues to help with needed transportation improvements. More work is needed to gain public support for this tool.

Through the end of 2018, ODOT is conducting a feasibility analysis to explore the options available and determine how value pricing, also known as congestion pricing, could help ease congestion in the greater Portland area. Oregon’s House Bill 2017, also known as Keep Oregon Moving, directs the Oregon Transportation Commission to develop a proposal for value pricing on I-5 and I-205 from the state line to the junction of the two freeways just south of Tualatin, to reduce congestion. The State Legislature directed the OTC to seek approval from the Federal Highway Administration no later than December 31, 2018. If FHWA approves the proposal, the OTC is required to implement value pricing. See Chapter 8 for more information about future planning and analysis of this strategy.

TSMO Policy 2. Expand use of access management, advanced technologies and other tools to actively manage the transportation system.

Multimodal traffic management strategies improve metropolitan mobility by applying technology solutions to actively manage the transportation system. Projects in this area improve integrated corridor management (e.g., coordination among operators), arterial traffic management (e.g., traffic signal timings, data collection and performance monitoring), expand transit priority treatments, pursue congestion pricing options, develop access management strategies, and implement active traffic management techniques.

The city of Gresham upgraded traffic signals along East Burnside Road to adaptive signal timing, which adjusts to real-time traffic flow. Average travel time along the corridor decreased by 15 percent as a result, benefiting automobiles, trucks and buses.

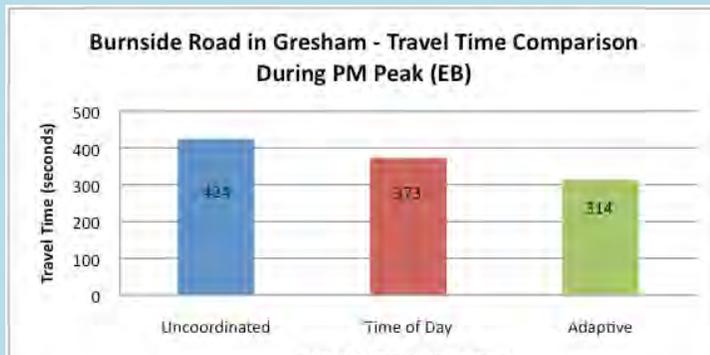


Figure 3. 34 TSMO Map shows where some of these strategies are being applied in the region to address growing congestion.

Figure 3.34 TSMO Map

Figure 3.34 TSMO Map

Note: TSMO Map will be updated and added to the final RTP.

TSMO Policy 3. Provide comprehensive, integrated, universally accessible real-time travel information to people and businesses.

Real-time traveler information provides travelers accurate and comprehensive information for their route, mode, and time of day choices. Providing centralized real-time and forecasted traveler information is one of the main goals of the TSMO concept. By providing accurate traveler information, system users can make more informed travel choices.

Ideally, this leads to optimal roadway usage, less unnecessary traveler delay, more walking, biking, transit and carpool trips, reduction in vehicle miles traveled and an improved traveler experience. All modes of travel benefit from improved traveler information. Drivers and freight traffic are able to make alternate route choices and avoid congestion; transit users can plan their transit trip with more certainty; and the information shows travelers walking or biking routes that meet their preferences.

Traveler information projects expand traveler information to arterial roadways, centralize all real-time data, further expand travel option marketing, improve multimodal traveler data and tools, and enhance data collection capabilities. The information can reach travelers through a variety of interfaces including internet, radio, cell phone, in-vehicle navigation devices, or variable message signs.

Currently, real-time traveler information in the greater Portland area is provided for most freeways and is distributed via variable message signs, radio, traffic surveillance cameras, TripCheck.com, TriMet trip planning tools and PORTAL. TriMet provides their schedule and real-time transit data to the public. This open source policy has led to the creation of many beneficial applications by third party developers.

For example, TriMet's Transit Tracker data, which predicts next arrival times for vehicles, can now be accessed through a variety of different mobile device applications. Traveler information is one area where public-private partnerships can flourish and benefit from transportation system uses.



In 2015, TripCheck.com received more than 32 million visits. Surveys show that information influenced travel decisions for 60 percent of site visitors.

TSMO Policy 4. Improve traffic incident detection and clearance times on the region’s transit, motor vehicle networks to reduce the impact of crashes on the transportation system.

Efficient incident management is critical to reducing incident related congestion and restoring capacity as quickly as possible after an incident. Incident management strategies enhance incident management capabilities, increase surveillance for faster incident detection, improve inter-agency communications, and implement active traffic management. Incident management responds to vehicle accidents and breakdowns, as well as weather related issues, to improve traffic operations and restore traffic flow.

Incident management targets safety and reliability. By clearing incidents quickly, the chance of secondary incidents decreases which improves safety. The primary modes that benefit from incident management strategies are automobiles, buses and trucks. Activities that also benefit from these strategies include disaster response, evacuation and security planning efforts.

Incidents that block travel lanes decrease capacity and lead to unreliable travel times as shown in **Table 3.33**. When lanes are blocked due to an incident capacity decreases significantly (even when the incident is on the shoulder) and travelers experience delays.



Past studies show:

- 20% of all incidents are secondary crashes
- For every 1 minute a primary incident continues to be a hazard, the likelihood of a secondary crash increases by almost 3%.

Active traffic management can:

- reduce primary crashes by 3% to 30%
- reduce secondary crashes by 40% to 50%
- reduce crash severity

Table 3.35 Detecting and clearing incidents quickly restores lost capacity

Number of Hwy Lanes	% Facility Capacity Lost by Blockage Type			
	Shoulder	1 Lane	2 Lanes	3 Lanes
2	19%	65%	100%	N/A
3	17%	51%	83%	100%
4	15%	42%	75%	87%

Source: TRB²¹

When implemented with active traffic management techniques, such as variable speed limits and lane management signs, the number and severity of crashes can be reduced.²²

²¹ Highway Capacity Manual 2000. *Transportation Research Board, National Research Council, Washington, D.C., 2000.*

²² Research and Innovative Technology Administration (RITA) Intelligent Transportation Systems Benefits Database. Website: <http://www.benefitcost.its.dot.gov/its/benecost.nsf/BenefitsHome> (June 2009)

TSMO Policy 5. Expand commuter programs, individualized marketing efforts and other tools throughout the region to increase awareness and use of travel options.

Through the Regional Travel Options (RTO) program, TSMO also manages transportation from the demand side to help residents and employees of the region increase their awareness and use of travel options and reduce their trips made driving alone. Transportation demand management (TDM) strategies shift trips from personal, single occupancy vehicles to alternative travel options by educating and encouraging the public. These travel options include transit, ridesharing²³, bicycling, and walking.



Carpooling is one strategy to reduce drive alone trips, supporting the region's efforts to improve mobility throughout the region.

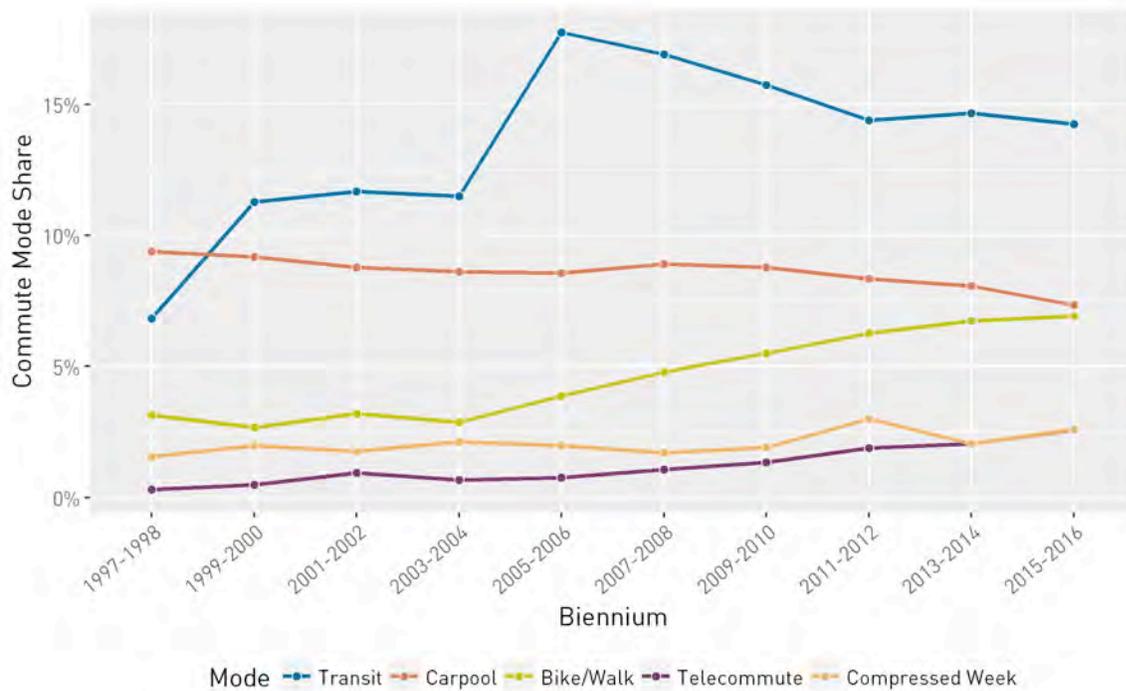
All modes benefit from TDM strategies. These strategies raise general awareness about transit, ridesharing, bicycling and walking use and encourage or incentivize travelers to use these options. Specific educational efforts tied with infrastructure investments, known as Safe Routes to School, make it easier and safer for children to travel to school. In addition, it creates the recognition with children that they have multiple options for how to travel.

People benefit from using travel options, including improved health, reduced roadway injuries and fatalities, reduced personal transportation costs, reduced GHG emissions, and improved travel times for other roadway users.

An example of how TDM efforts are delivered is the region's long-standing program to reduce single-occupant-vehicle commute trips. RTO partners provide services to over one thousand employers throughout the Portland region. Employers may implement travel option programs such as buying transit passes for their employees. Over the last eighteen years, employee commute trips that used non-drive alone modes (transit, bicycling, walking, carpooling/vanpooling, and telecommuting) rose from 20 percent to over 32 percent among participating employers.

²³ "Ridesharing" in this context means traditional not-for-profit carpooling or vanpooling, not Transportation Network Companies such as Uber or Lyft.

Figure 3.36 Effectiveness of Employer-Based Commuter Programs



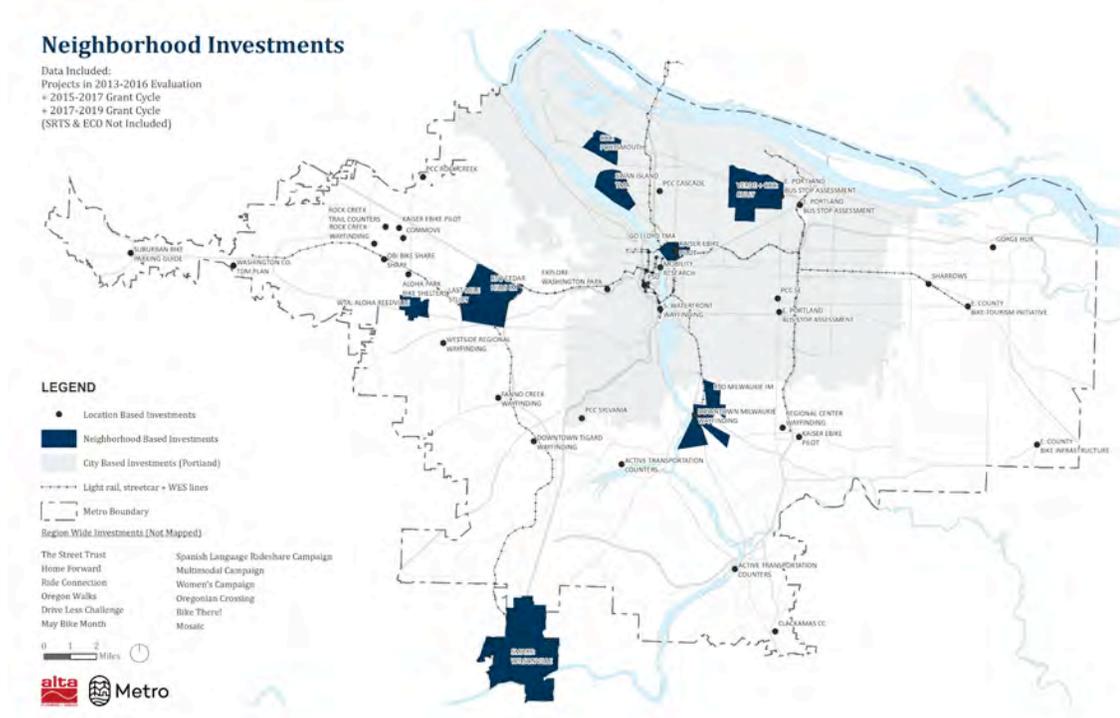
TDM projects support the 2040 growth concept by encouraging people to make choices that reduce their dependence on cars. As a result, vehicle trips are reduced, saving energy and reducing vehicle emissions.

TSMO Policy 6. Build public, non-profit and private sector capacity throughout the region to promote travel options.

Metro leads the region’s TDM efforts through the RTO program. The RTO program consists primarily of a series of local efforts, led by regional and local governments, education, and not-for-profit partners. These partners produce educational events and outreach to connect with the public. Their efforts are aimed at encouraging people to use non-SOV travel modes for more of their travel. Metro provides oversight, funding and coordination for the program.

While employer outreach is a region-wide effort, much of the RTO program’s efforts have been historically focused within the city of Portland. **Figure 3.37** illustrates where local partnerships have conducted RTO events or programming. The maps highlights that RTO efforts are not present in much of the region outside the city of Portland.

Figure 3.37 Local Regional Travel Options Program investments



In order to fully realize the benefits of managing demand, additional RTO efforts need to be implemented throughout the region. The needs of historically underserved communities are particularly underrepresented in the current RTO program investments. The RTO Strategy defines goals and objectives that address the need to implement further TDM efforts. Allocation of regional flexible funds ensures that program resources are available to help develop local partners develop new outreach efforts.

TSMO Policy 7. Manage parking in mixed-use centers and corridors served by frequent transit service and good biking and walking connections to reduce the amount of land dedicated to parking, encourage parking turnover, increase shared trips, biking, walking and use of transit, reduce vehicle miles traveled and generate revenue.

Other tools include parking management strategies, which aim to use parking resources more efficiently. Parking management strategies can include dynamic parking pricing, shared parking that serves multiple users or destinations, preferential parking or price discounts for carpools.

When appropriately applied, parking management can reduce the number of parking spaces required in some situations. Implementation of parking management may require changing current development, zoning and design practices, broadening how parking problems and solutions are addressed and activities to improve enforcement and addressing potential spillover impacts. A regional parking management strategy would assist local jurisdictions efforts to implement parking management.

Note: Regional Parking Map in the Regional Transportation Functional Plan will be updated and added to the final RTP.

3.12 MOVING FROM VISION TO ACTION

Implementation of the concepts and policies in this chapter will result in a complete and interconnected transportation system that supports all modes of travel and implementation of the 2040 Growth Concept. These idealized network concepts, along with performance measures and targets in Chapter 2, form the basis for identifying system needs and deficiencies and the investment priorities in Chapter 6. The policies in this chapter recognize that each element of the transportation system may perform multiple functions, and that each will need to be tailored to fit local geography, respect existing communities and development patterns and protect the natural environment.

The RTP will be implemented through a variety of strategies and actions at the local, regional, state and federal levels. The various jurisdictions in the region are expected to pursue policies and projects that contribute to implementing the Regional Transportation Plan.



Implementation of the Regional Transportation Plan will result in a safe, reliable, healthy and affordable transportation system.

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2018 Regional Transportation Plan



safe • reliable • healthy • affordable

PUBLIC REVIEW DRAFT

2018 Regional Transportation Plan

Chapter 4

Our Growing and Changing Region

June 29, 2018

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4.1 INTRODUCTION

Our region continues to grow and change

The greater Portland region is an extraordinary place to call home. It is known for its unique communities, a diverse and growing economy and a world-class transportation system. The region is surrounded by stunning natural landscapes and crisscrossed with a network of parks, trails and natural areas within a walk, bike ride or transit stop from home.

Part of the broader Pacific Northwest region, the Portland-Vancouver metropolitan area is one of four international gateways on the West Coast. In this role, the region serves as a freight gateway to domestic and international markets for businesses located throughout the state of Oregon, Southwest Washington, the Mountain states and the Midwest.

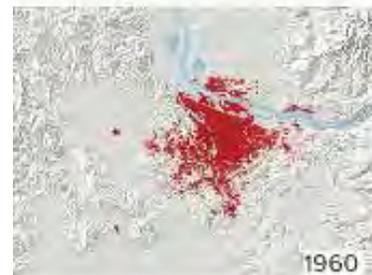
Over the years, communities throughout the region have taken a collaborative approach to planning that has helped make the region one of the most livable in the country.

Every day, the region's 2.4 million people have places to go – to work or school, to doctors and grocery stores and parks and back home again. All these trips, along with our transportation system, knit the region together – from Forest Grove to Troutdale, Vancouver and Portland to Wilsonville and every community in between.

Because of our dedication to planning and working together to make local and regional plans a reality, we have set a wise course for managing growth – but times are challenging. The region is growing, our economy is expanding, and emerging technologies are changing how we do business and get around.

Housing affordability, climate change, racial disparities, traffic deaths and life changing injuries, and traffic congestion demand new kinds of leadership, innovation and thoughtful deliberation and action to ensure our region remains a great place to live, work and play for everyone. In collaboration with city, county, state, business and

Land development, 1910-2010



community leaders, Metro has researched how land use and transportation policies and investments can be leveraged to respond to these complex and interrelated challenges at a regional scale.

This chapter provides a snapshot of current conditions, how our region is growing and changing and the challenges and opportunities that lay ahead.

The region expects to welcome more than 500,000 new residents – about half from growing families – and more than 350,000 new jobs within the urban growth boundary by 2040.



4.1.1 Chapter organization

This chapter provides a snapshot of current regional growth trends and existing conditions and outlines key transportation challenges the plan will address. The chapter also highlights opportunities for building a regional transportation system that reflects our values and vision for the future.

4.1 Introduction: This section introduces the chapter.

4.2 Who We Are: This section provides an overview of population growth; demographic changes for race, ethnicity and age; where people live and work; employment growth and jobs.

4.3 How We Get Around: This section provides a snapshot of how people in the region get around – driving, transit, walking and bicycling.

4.4 How We Move Goods and Services: This section provides an overview of how goods and services move in the region and how the region is competing in a global economy,

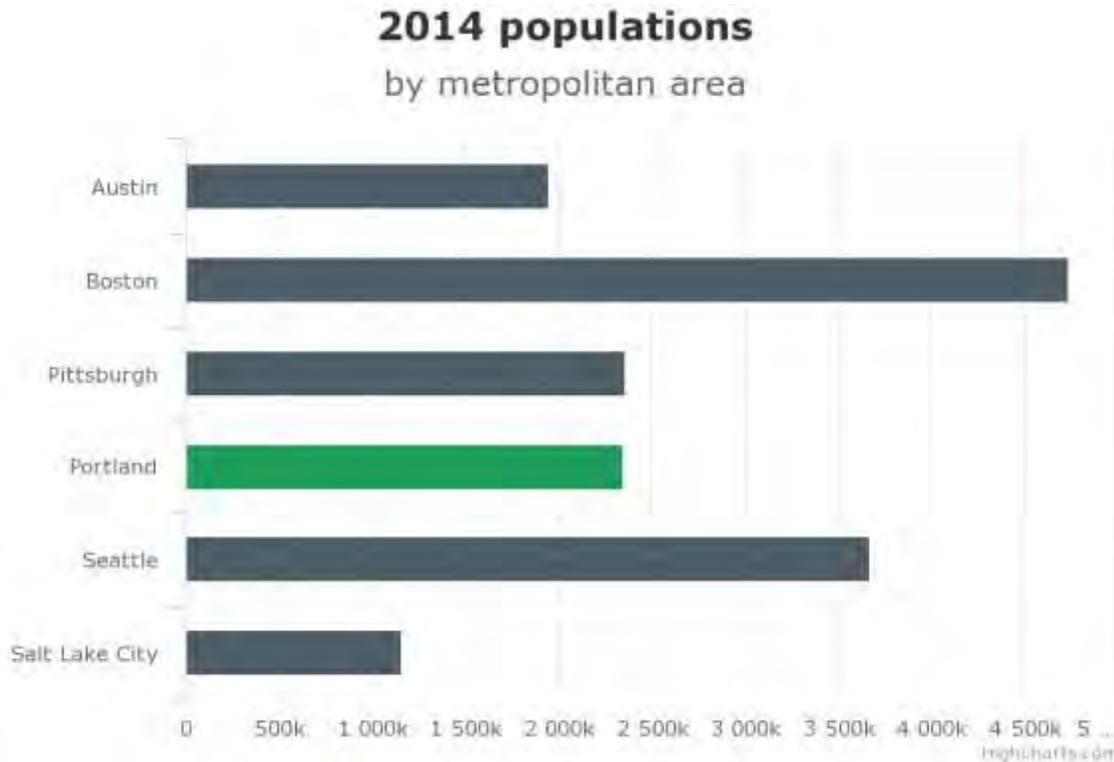
4.5 How We Keep Our Environment Healthy: This section describes current efforts and strategies to protect historic and cultural resources and keep the air, water and habitat in the greater Portland region healthy.

4.6 How the System Is Working – Challenges and Opportunities Ahead: This section describes the major challenges the region is facing and the opportunities that each challenge presents to achieve the region’s vision for funding the transportation we need; updating and maintaining aging infrastructure; addressing climate change and air quality; addressing congestion and reliability; eliminating fatal and life-changing motor-vehicle crashes; addressing earthquake vulnerability, security and emergency services; filling gaps in transit, biking and walking connections; addressing housing and transportation affordability and displacement; addressing social inequity and disparities; and proactively addressing technological change.

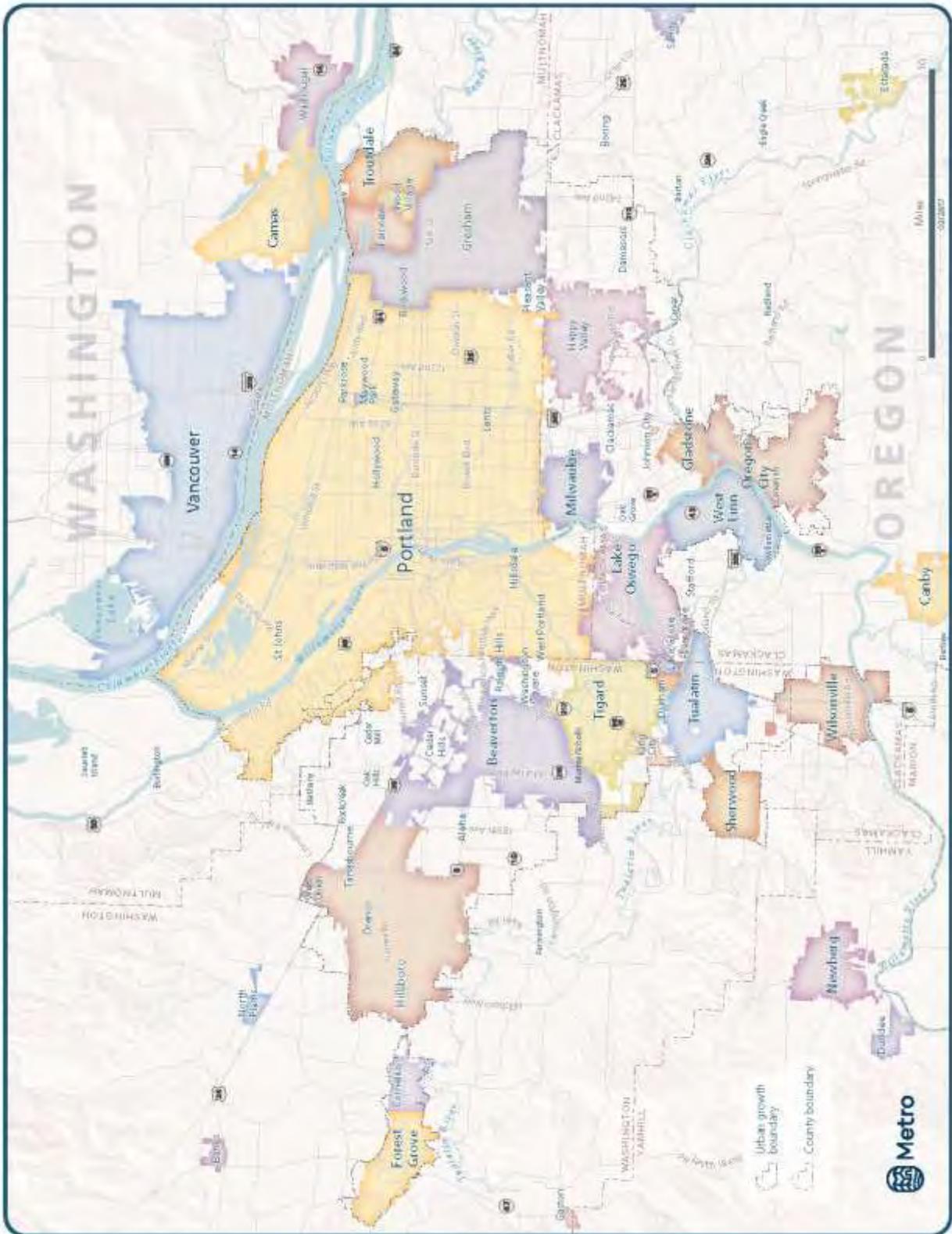
4.2 WHO WE ARE

The Portland metropolitan region is growing and changing, shaped by a global economy, a warming planet, demographic changes, public health and safety concerns and changes in how we live and travel. By population, Portland is the 24th largest metropolitan area in the country. The region has about half as many people as Boston and twice as many people as Salt Lake City. The greater Pittsburgh and San Antonio regions are about the same size.

Figure 4.1 Population by metropolitan area, 2014

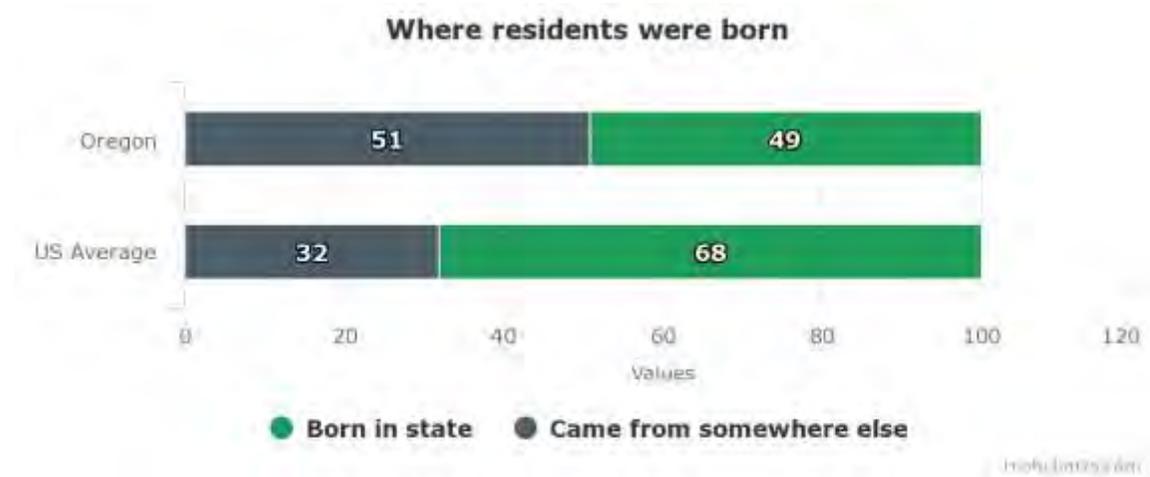


The Oregon portion of the Portland-Vancouver metropolitan region encompasses 24 cities and 3 counties as shown on the next page. Metro's urban growth boundary includes 403 square miles and more than 1.5 million residents.



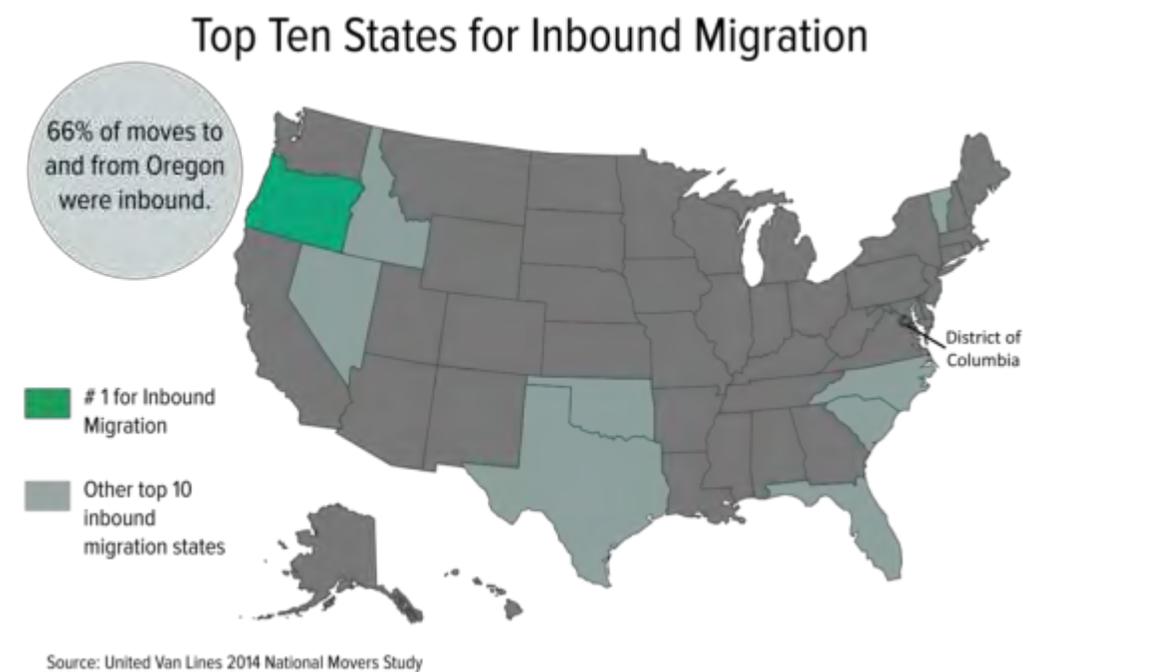
Our region continues to grow. New forecasts show that between 2015 and 2035, about 400,000 additional people are expected to live within the Metro region’s urban growth boundary.¹ But how much are we growing, and how fast? And where are these new people coming from? In short, many are coming from somewhere else in the country, and it's adding up. Nationally, 68 percent of Americans live in the state where they were born, however in Oregon 51 percent of population came from somewhere else.

Figure 4.2 Percent of population by location of birth



Oregon is the number one state for inbound migration for the second year in a row.

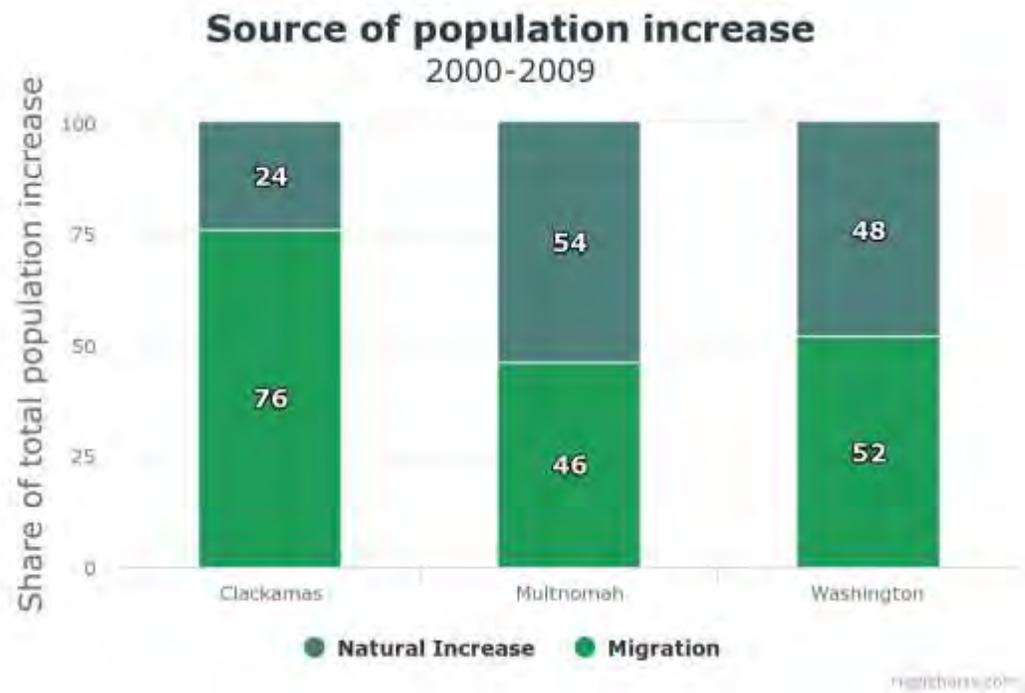
Figure 4.3 Top ten states for inbound migration



¹ 2014 Urban Growth Report, Metro, December 2015

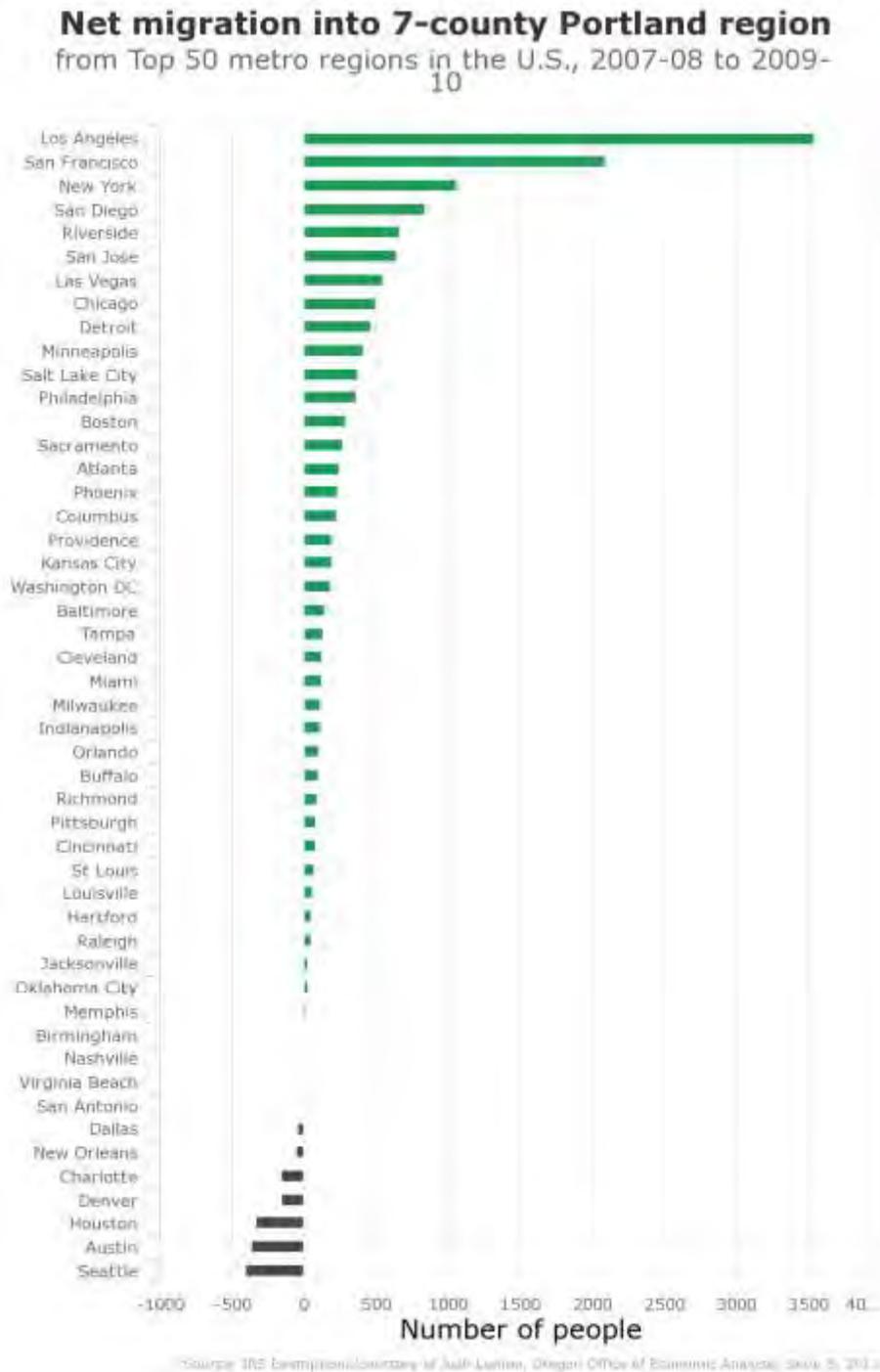
But different parts of the region are experiencing different sources of growth. For instance, between 2000 and 2009, Clackamas and Washington counties primarily grew due to people moving from other counties around the country. Most of Multnomah County’s growth in that period was the result of natural increase – in other words, more people being born than dying in the county, as shown in **Figure 4.4** below.

Figure 4.4 Source of population increase in the three counties, 2000-2009



Most of the people are coming from California. From 2007-08 to 2009-10, four of the top five cities contributing to the Portland region's growth were Californian. (New York City was the only non-Californian city in the top five.) On the other hand, the region is losing people to Seattle, Austin and Houston.

Figure 4.5 Net migration into the 7-county Portland region



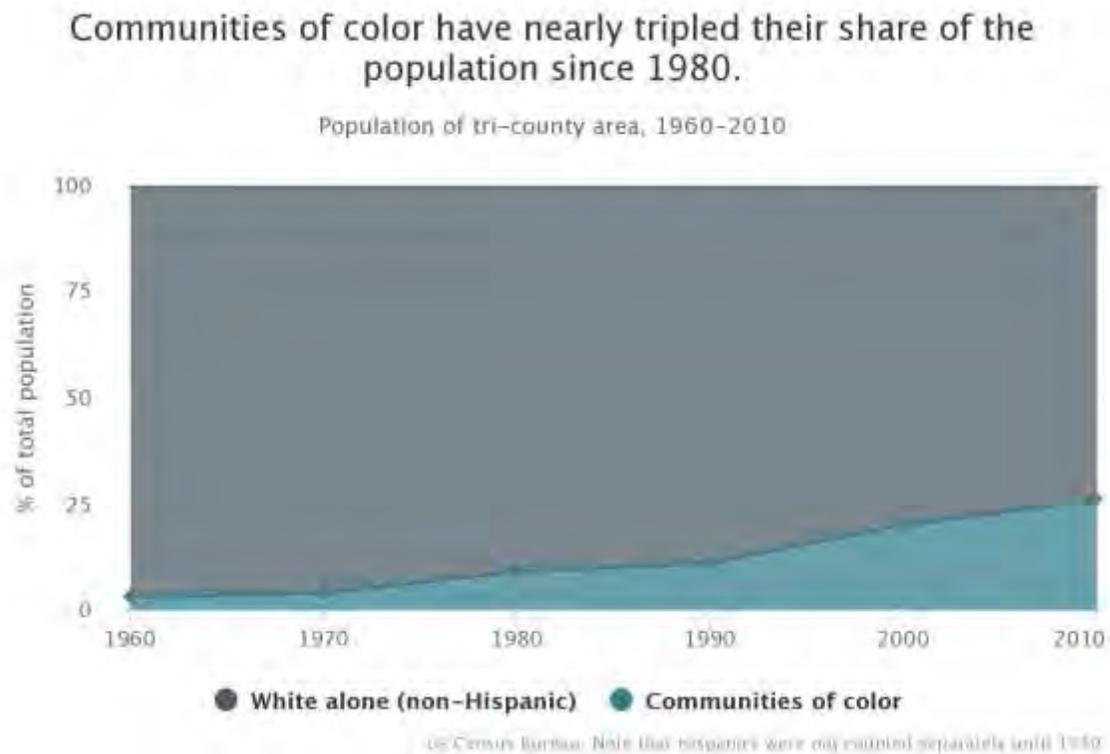
While this growth brings jobs and opportunity, it also creates new challenges; more people will be using the region’s transportation system to get to work, school, shopping and other daily activities. According to the 2011 Oregon Household Activity Survey, the average household in the Portland region makes 9.2 trips per day with an average trip length of 4.4 miles for trips taken by car.

4.2.1 Demographic changes

Our population and communities continue to change. While the greater Portland region historically has had less racial diversity than other American cities, the region increasingly reflects the diversity of the country. However, the specific historic and systemic exclusion of and bias against African Americans is still reflected in the makeup of our population. In 2010, the population of greater Portland was 71 percent White compared to 64 percent nationally, and 4 percent African American compared to 12 percent nationally.

Also of note is the difference in Hispanic/Latinx population (10 percent for the region, 16 percent nationally) and those whose racial/ethnic identity is not easily categorized by the U.S. Census categories (those grouped as “other”: 6 percent for the region, 2 percent nationally). Communities of color are growing in their share of the Portland region's population, and they are less concentrated in Multnomah County than they once were.

Figure 4.6 Communities of color share of population since 1980

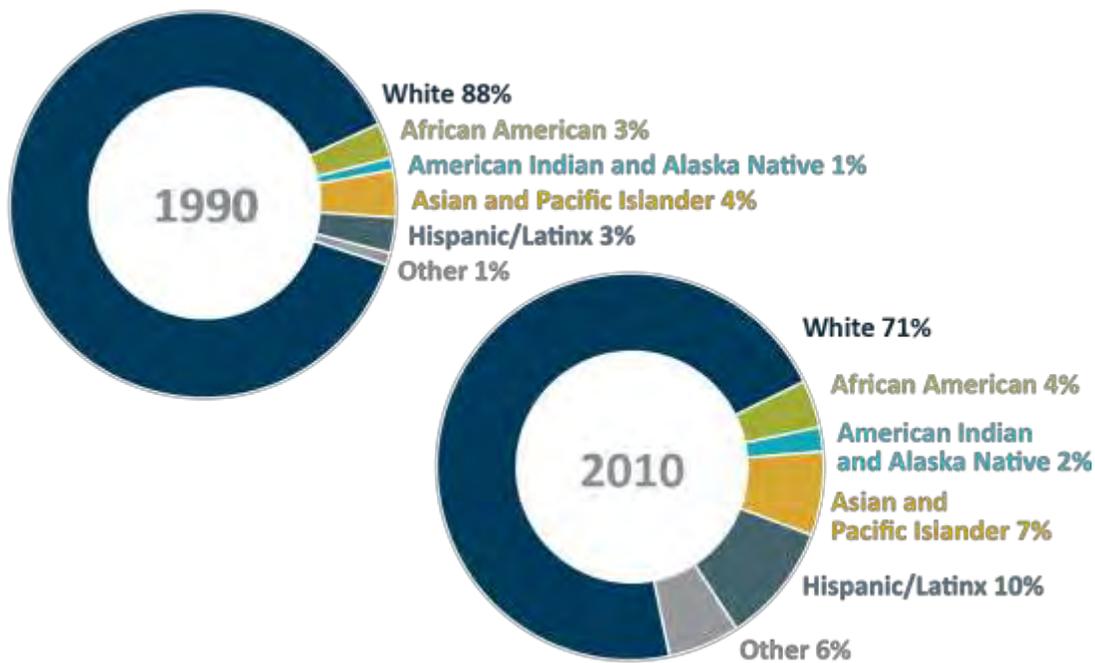


In 1960, Clackamas and Washington counties had a combined population of 205,275. According to that year's Census, 153 of them were black and 965 were neither white nor black. In Multnomah County, about 16,000 people of the county's total population of 523,000 people were black – the vast majority of the state's 18,000 black residents. By 2010, Multnomah County had 530,000 white, non-Hispanic residents – about 72 percent of its total population of 735,334 residents. The black population had grown to

41,000 residents, still the majority of Oregon's 69,000 black residents but not the overwhelming majority it was four decades earlier.

In 2010, about 220,000 residents of Clackamas and Washington counties identified as Hispanic or a race other than white – about a quarter of their total population. In 1980, the first year the Census reliably tracked Hispanic population figures; there were about 21,000 Hispanics in greater Portland – about 2 percent of the tri-county population. By 2014, that number was estimated to be 202,000 – close to 12 percent. Overall, communities of color saw their share of greater Portland's population rise from barely 3 percent in 1960 to almost 26 percent in 2010.

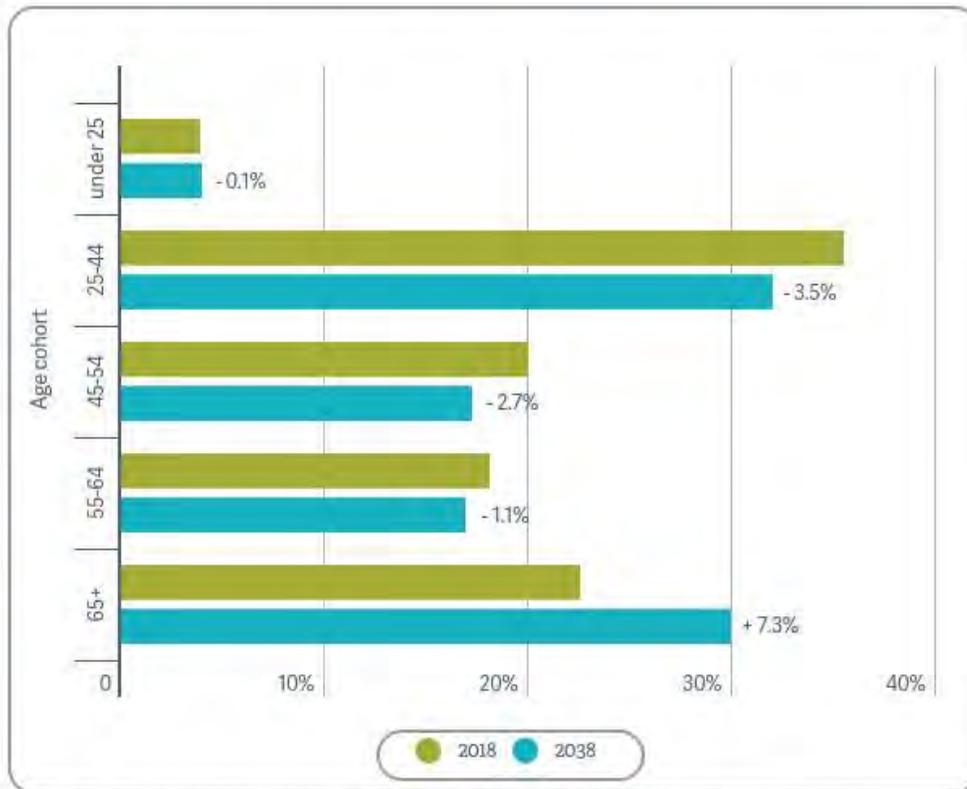
Figure 4.7 Race and ethnicity in the greater Portland region



Source: 1990 and 2010 US census

Figure 4.8 Age cohorts as a percentage of total population

Age cohorts as a percentage of total population
7-county Portland-Vancouver-Hillsboro MSA, 2018 and 2038



Source: 2018-38 Portland-Vancouver-Hillsboro, OR-WA MSA Forecast, Metro Research Center, November 2017

In the greater metropolitan statistical area (MSA) which includes the greater Portland area, there will be a significant growth in the older adult (65+ years) population between 2018 and 2038 of over 7 percent, compared to a reduction for other age groups.

The changing demographics of the region for age follow a national trend of aging – the percent of the population over 65 continues to increase. Today, 12 percent of Americans are over the age of 65. By 2030, 20 percent of the United States’ population will be older than 65.

Public health is a growing concern

Interest in the connection between urban planning and active living has continued to grow since the 1990s, an outcome of a growing interest in “smart growth,” a movement to integrate land use, transportation and public health planning. Studies since then report positive effects on human health in neighborhoods built to encourage walking and biking. In addition, transportation systems impact chronic diseases such as asthma that are

related to air quality and vehicle emissions. These health impacts affect people of color disproportionately. The greater Portland region has long embraced such policies, based on land use and transportation benefits, and the introduction of health goals and objectives in transportation planning supports efforts to positively impact public health with transportation design.

Figure 4.9 Prevalence of self-reported obesity among U.S. adults by state and territory, BRFSS, 2011



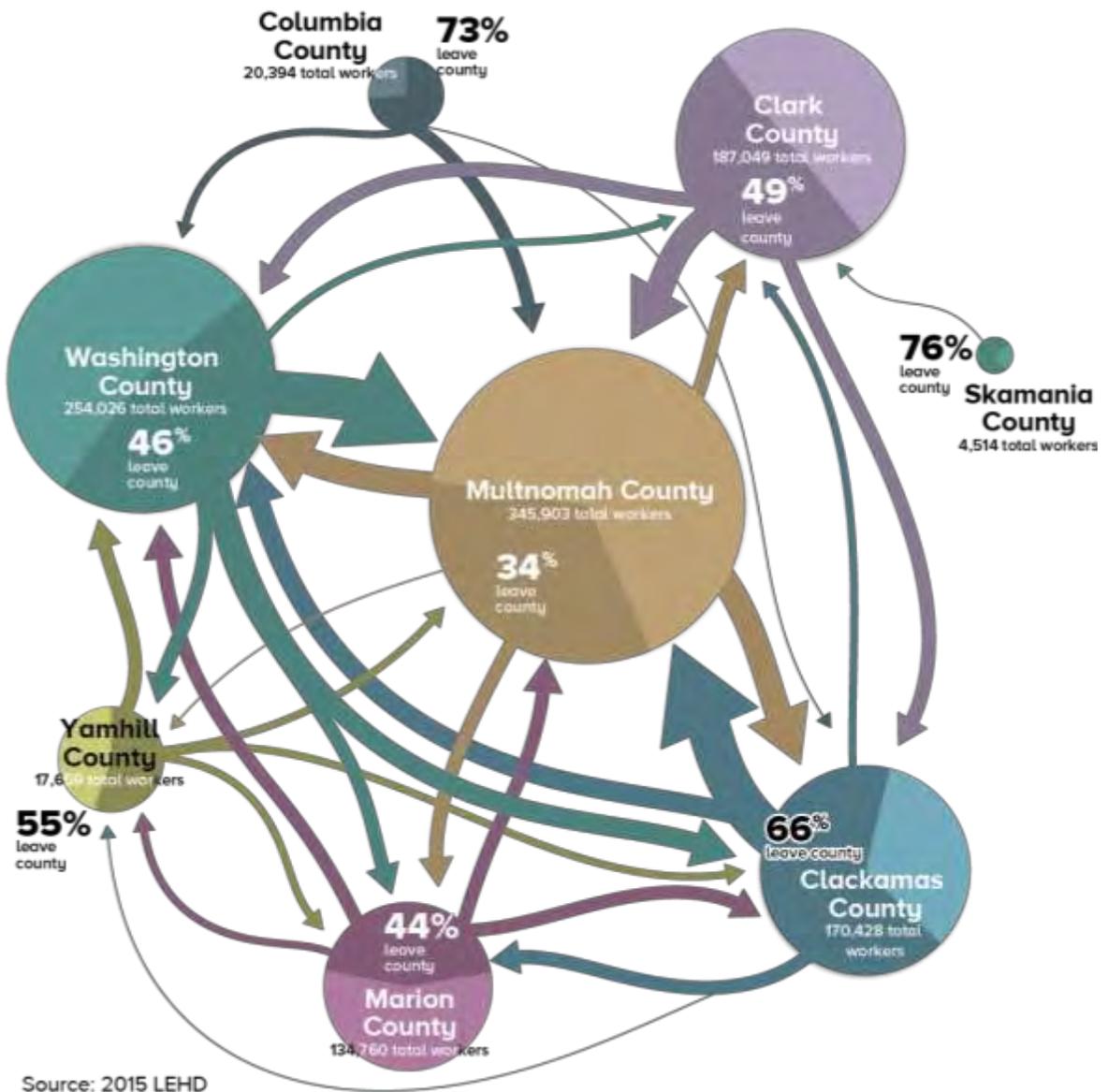
Figure 4.10 Prevalence of self-reported obesity among U.S. adults by state and territory, BRFSS, 2016



4.2.2 Where we live and work

There are differences in where each of us goes every day, providing insight into the region's distribution of housing and jobs. Take the flow of the daily commute, for example. Multnomah County has the most working residents and the most jobs. According to data from the Census Bureau, two-thirds of working residents in Multnomah County stay in their home county for work. Of those who leave, most head into Washington County, the region's second biggest job center.

Figure 4.11 Where residents work in the greater Portland region



For working residents of Clark and Washington counties, it's roughly an even split between working in the county and leaving, with most workers who leave commuting into Multnomah County. Clackamas County sees two-thirds of its working residents commute elsewhere, also mostly to Multnomah County. Washington and Clackamas counties also swap thousands of working residents each day – though not nearly as many commuters as each county send into Multnomah County.

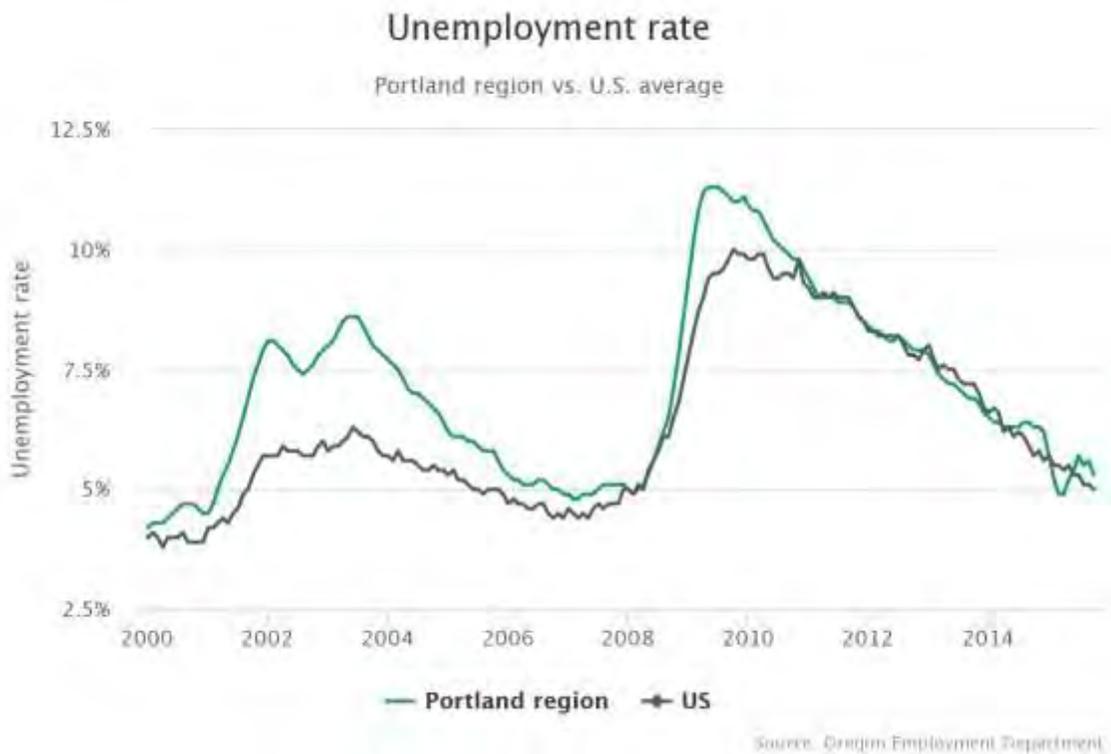
Did you know?

Since the adoption of the 2040 Growth Concept, the majority of new homes have been added in downtowns and centers across the greater Portland region.

4.2.3 Jobs and a growing economy

The region's economy has been marked by job growth, shifts in job types, and growth in traded sector businesses. The greater Portland region employs over a million workers, the fifth largest workforce on the west coast². Prior to about 2011, the region had higher unemployment rates compared to the U.S. as a whole, but since the recovery, Portland's rates have been more in sync with the rest of the nation.

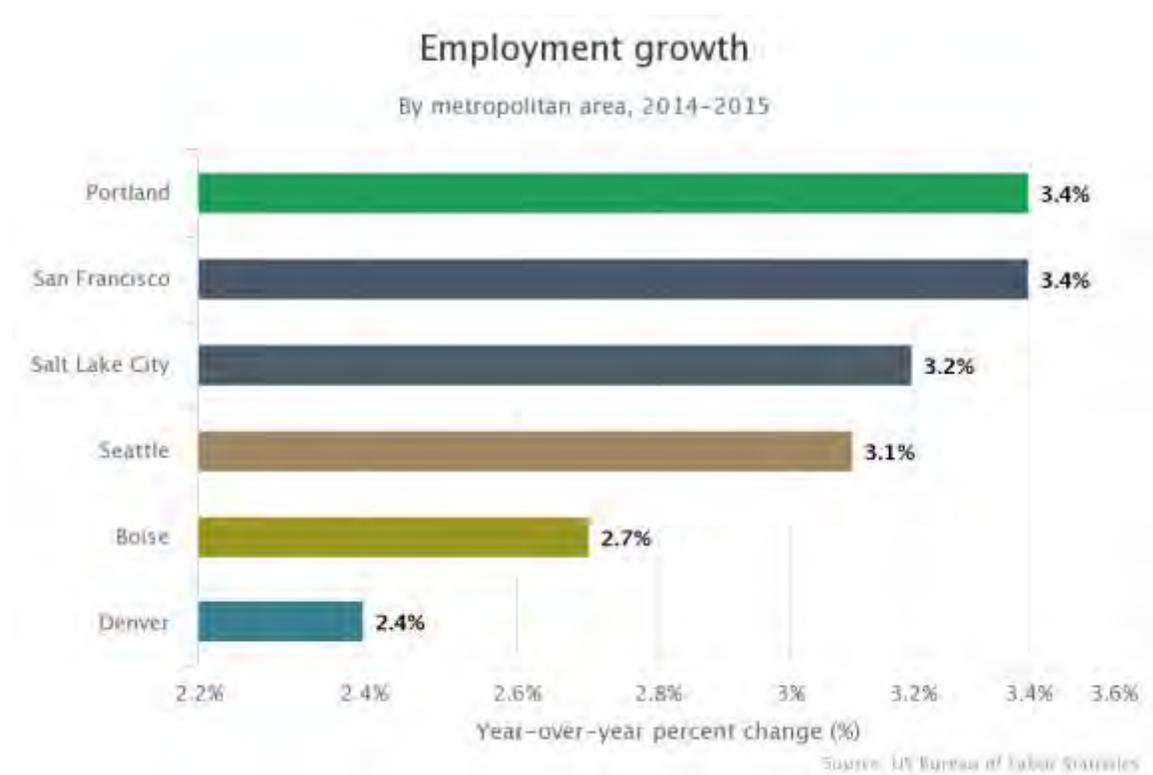
Figure 4.12 Unemployment rate in the greater Portland region



The region has regained twice as many jobs as it lost in the recession and job growth is up. The region is also attracting a young, highly educated workforce. Over the past year, Portland's growth has been strong – on par with San Francisco.

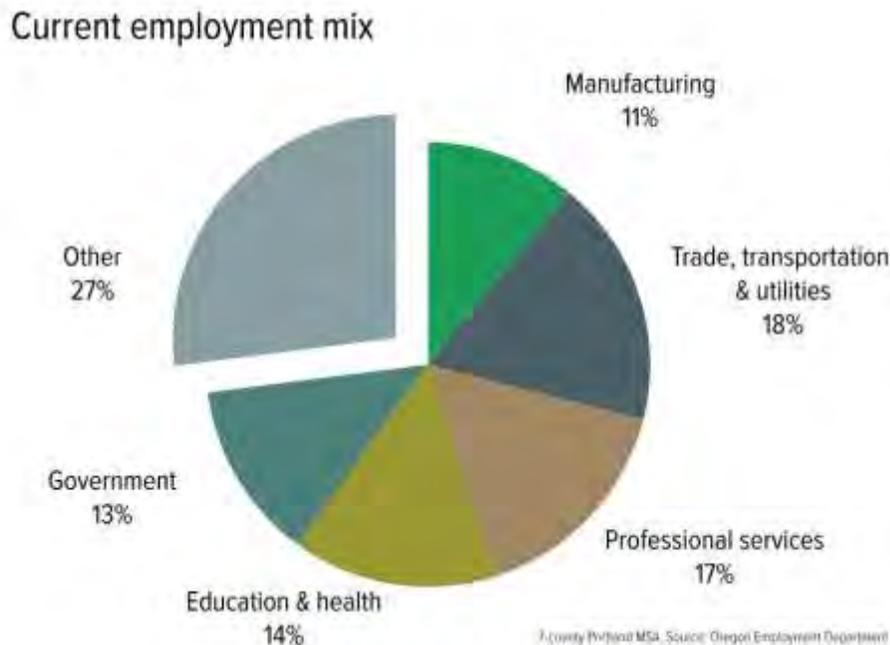
² [Greater Portland Work Book, 2013-14](#)

Figure 4.13 Employment growth



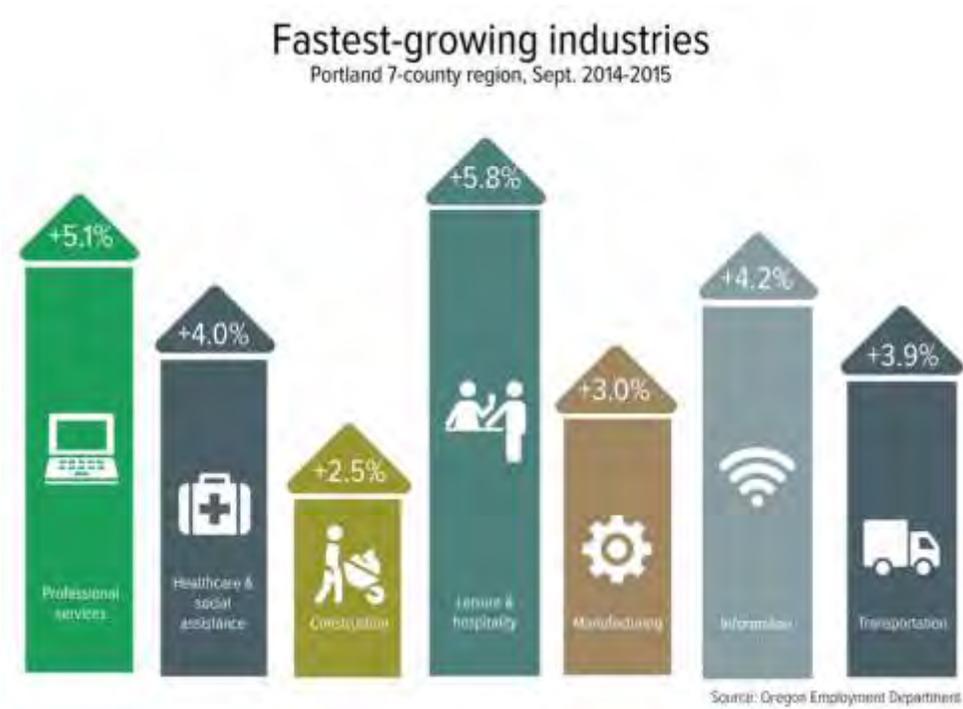
Currently almost half of Portland area residents work in trade and transportation, professional services, and education and health.

Figure 4.14 Employment mix in the 7-county MSA, 2015



Several job sectors are doing exceptionally well in the Portland region, particularly professional and business services and leisure and hospitality. These sectors have been adding workers more quickly than other sectors as the region comes out of the recession.

Figure 4.15 Fastest growing industries

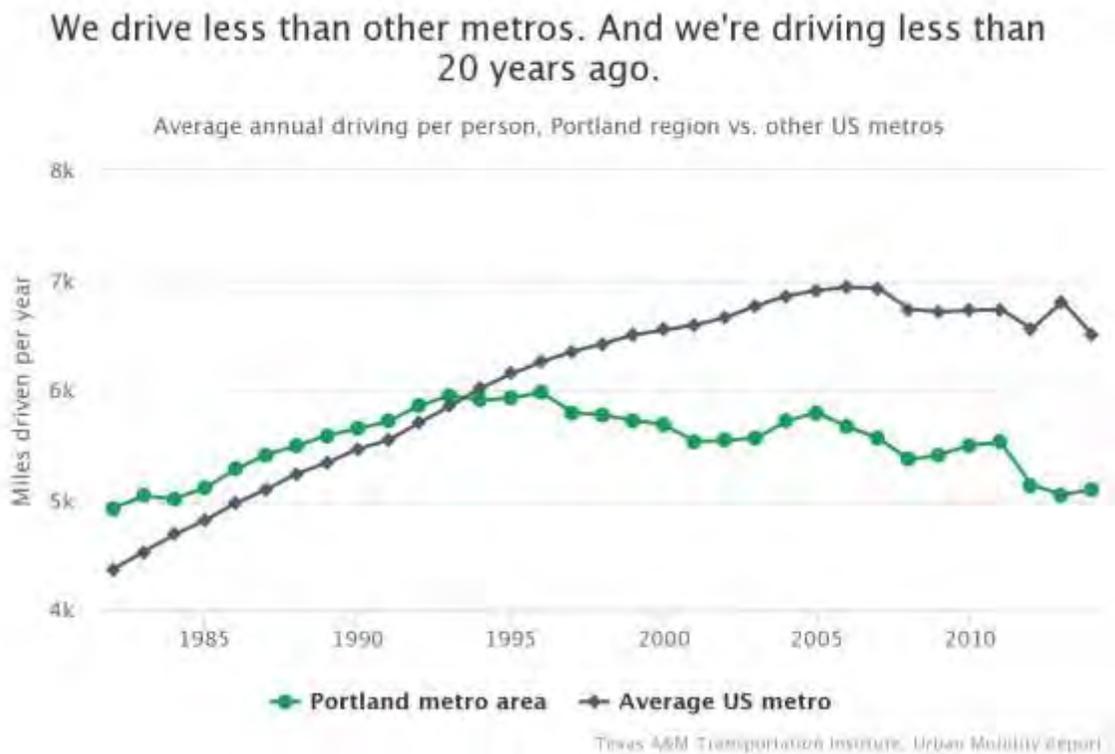


4.4 HOW WE GET AROUND

4.4.1 Travel

Travel behavior—mode choice, commuting patterns, trip length and frequency—is influenced by a number of factors, including demographics, land use, community design, cost, access, the economy, job locations as well as social and environmental values. On a per-person basis, the Portland region has been driving less since 1996, even as people take about the same number of trips each day. According to the 2015 Texas A&M Transportation Institute’s Urban Mobility Report, the region’s residents drove just 5,000 miles per person in 2014 – that’s nearly 25 percent less than other US metro regions of similar size.

Figure 4.16 Average annual driving per person, greater Portland region compared to other metropolitan areas



Why are people driving less here? Part of the reason is that people in the Portland region are making different choices about getting around – a reflection of the multimodal options available as defined in the 2040 Growth Concept. US Census estimates from 2014 show that while the national average for drive-alone commuting is 76.4 percent, the Portland metro area’s average was just 70.7 percent, resulting in associated reductions in greenhouse gas emissions for the region.

Though a growing population invariably means more commuters, just under half of the workers added since 2000 drive to work alone. The majority are choosing other modes, or working from home.

Figure 4.17 Ranking of drive alone commuting in metropolitan areas

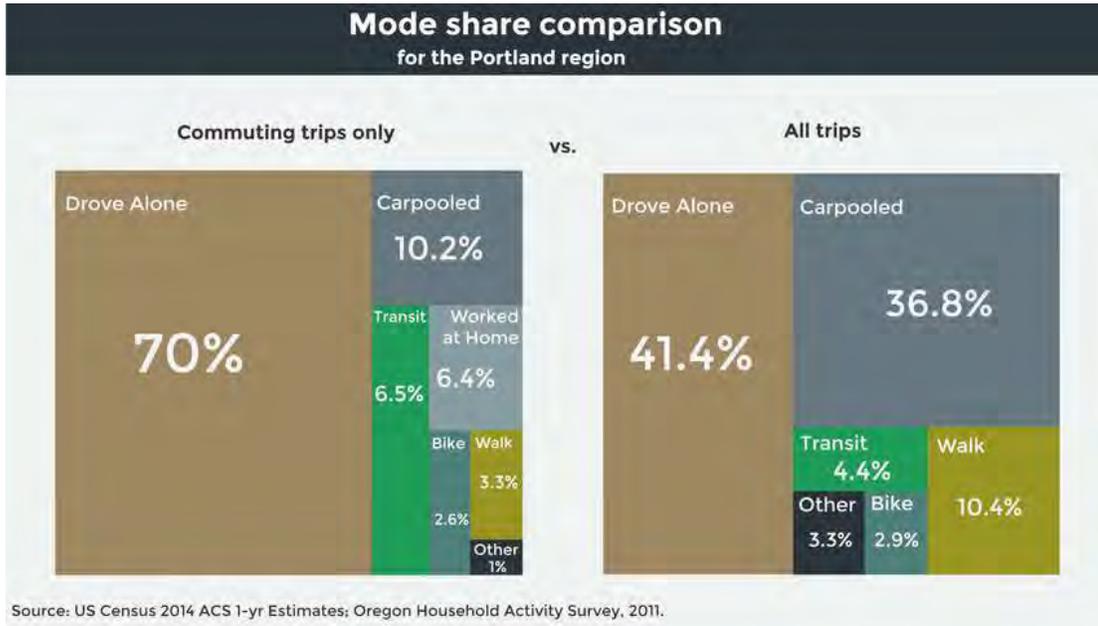
Greater Portland has the 6th-lowest rate of drive-alone commuting.



4.4.2 Mode share

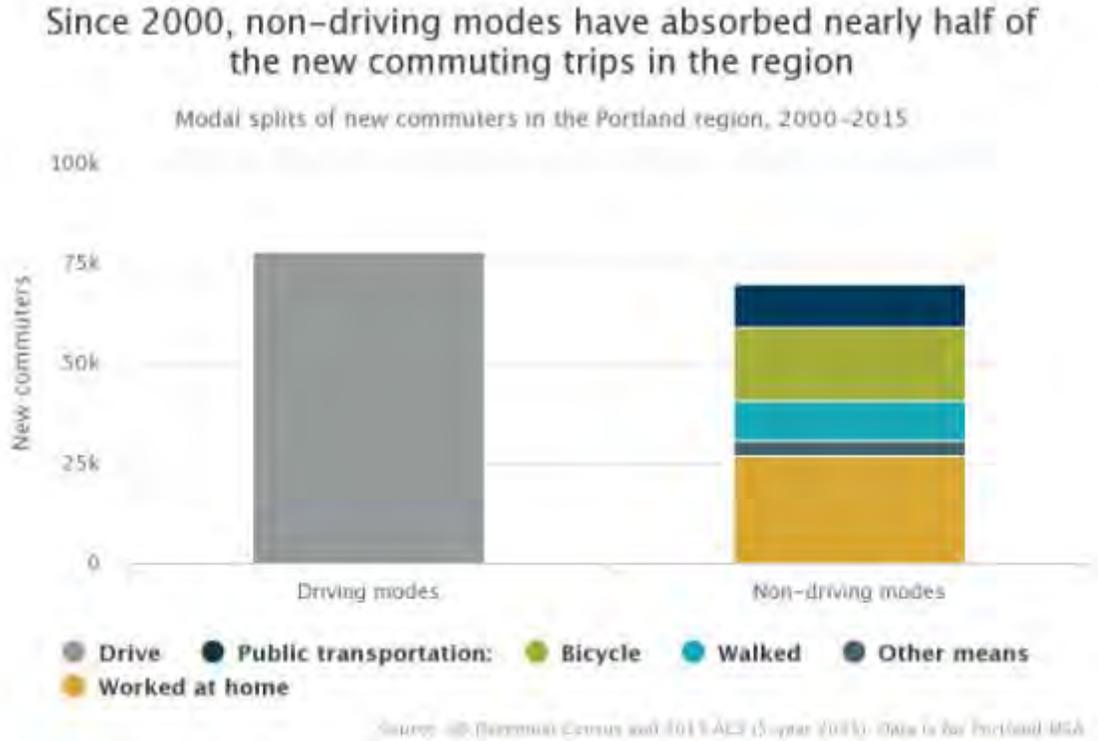
Travel to work has typically been the focus of transportation planning, especially given its prominence in the morning and evening peak periods. However these trips make up a relatively small portion of all the trips taken throughout the region. Nationwide travel for non-work purposes, such as shopping, errands and recreation is growing faster than work travel. In fact, more than 70 percent of the trips taken in the Portland region are for reasons other than school and work.

Figure 4.18 Mode share comparison for commute and all trips



Though a growing population invariably means more commuters, just under half of the workers added since 2000 drive to work alone. The majority are choosing other modes, or working from home.

Figure 4.19 Mode share of new commuters in the 7-county MSA, 2000-2015



In 2003, Metro’s Regional Travel Options (RTO) program started to target non-commute trips during rush hour and throughout the day as a key strategy for addressing congestion and air quality issues in the region.

Driving is the most predominant way for people in the region to get around. In 2015, more than 80 percent of all trips in the greater Portland region were made by motor vehicle. Communities of color drive less than White residents in the region.

Figure 4.20 Travel modes by white and non-white populations, 2011

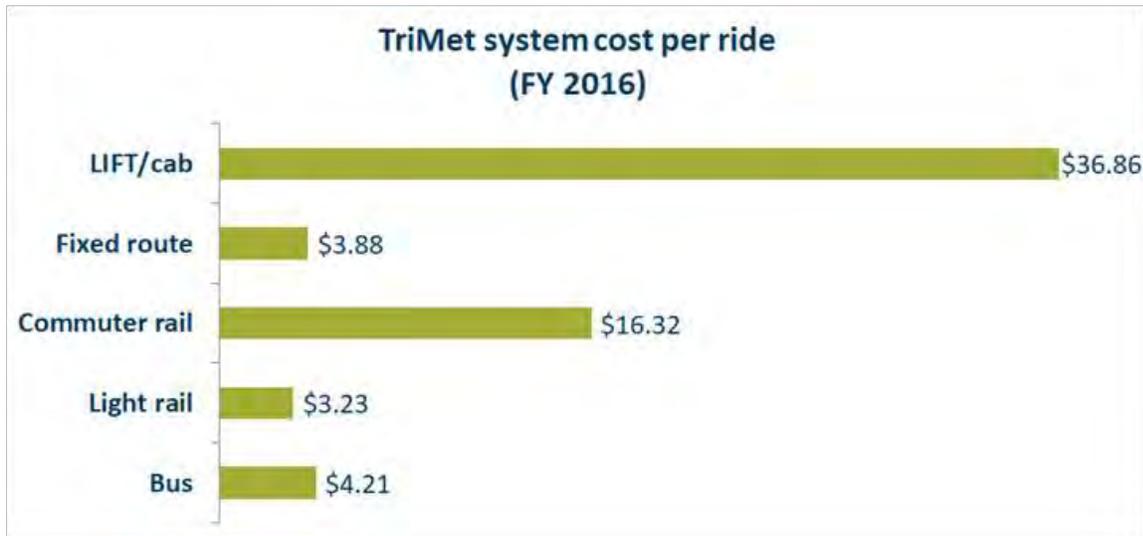


Driving remains the most expensive form of transportation, both for individuals and for society. The average annual cost of owning an automobile is over \$8,000 a year. However, fuel is comparatively cheap, and driving remains a convenient and efficient way to travel in the region.

Figure 4.21 Annual transportation costs

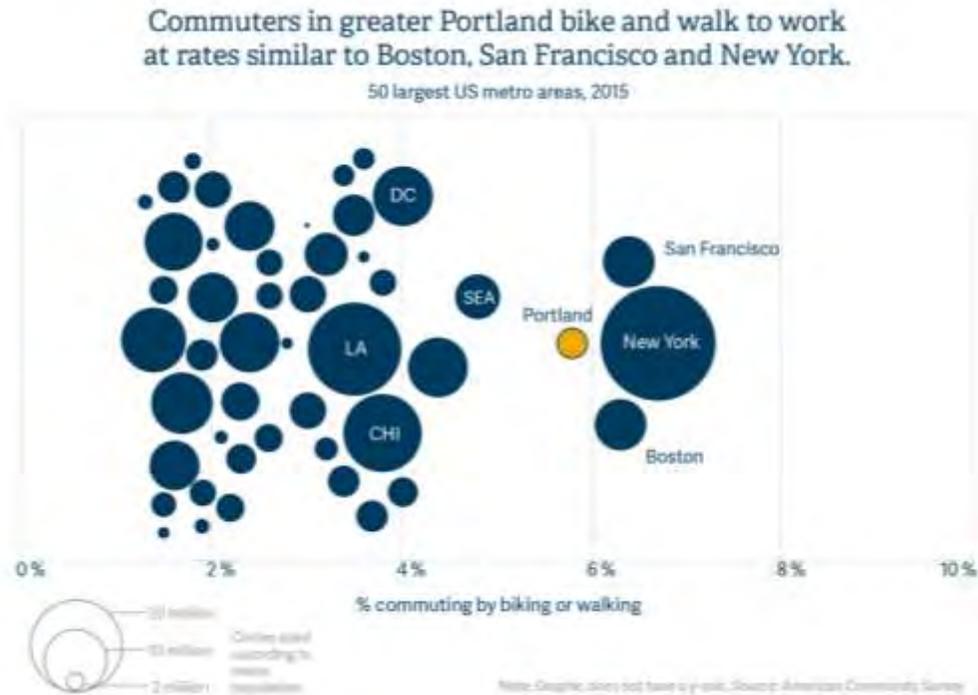


Figure 4.22 2016 TriMet cost per ride



Walking is the most primary form of transportation. Whether an entire trip is done on foot or using a wheelchair or similar mobility device, people must walk for at least a part of every trip, even when the rest of the trip takes place on transit, in a vehicle or on a bicycle. Pedestrian activity thrives where the pedestrian facilities are well connected, safe and attractive—meaning well lit, free of debris and in good repair—and frequent protected crossings. Therefore it is critical that our transportation system supports and encourages walking for short trips.

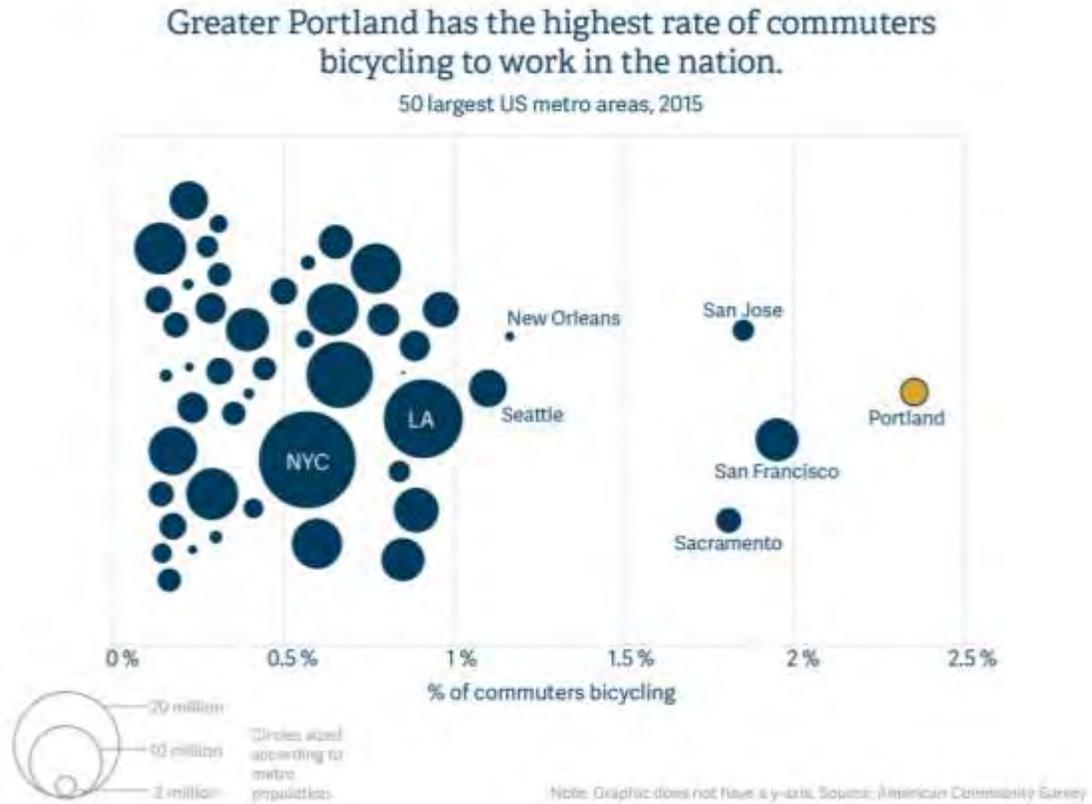
Figure 4.23 Bike and walk commute rates for metropolitan areas



Bicycling plays an important and growing role in the regional transportation system and the region's economy. Bicycling for transportation grew by 191 percent between 1994 and 2011 adding to the growing demand for improved bicycle facilities.³ Counts taken across five Portland city bridges reported 18,794 daily bicycle trips—a 128 percent increase over the previous 10 years. Increased ridership is due in part to improved bicycle infrastructure as well as increased recognition of the health benefits of bicycling.

³ 2011 Oregon Household Activity Survey, Metro.

Figure 4.24 Bike commute rates for metropolitan areas

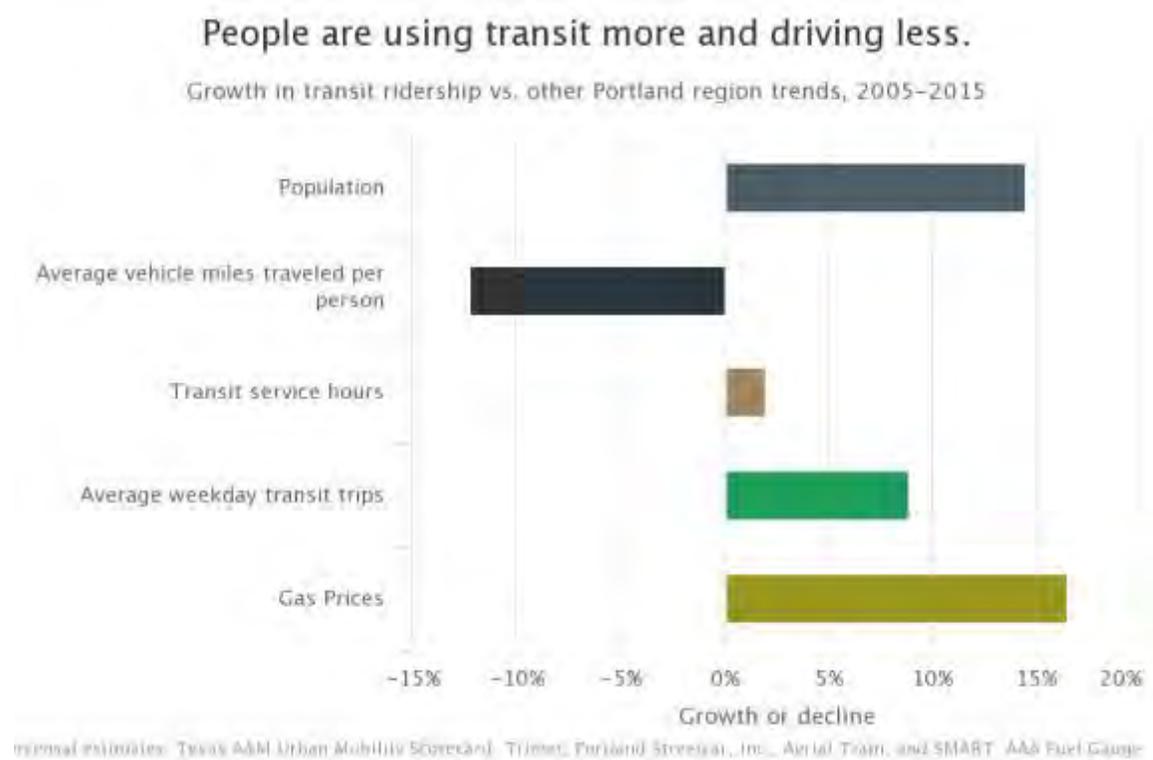


Transit - MAX Light rail, WES commuter rail, bus, and Portland Streetcar and supporting infrastructure make up the current regional transit system, which has seen increased ridership. In 2014, people in the Portland region took more than 103 million rides on transit. Although ridership has fluctuated over the last 10 years, weekday transit ridership among the region's major transit services – TriMet, SMART (Wilsonville), C-TRAN (Vancouver and Clark County WA) and Portland Streetcar – has grown while the average miles each person drives daily has declined.

Figure 4.25 Transit commute rates for metropolitan areas

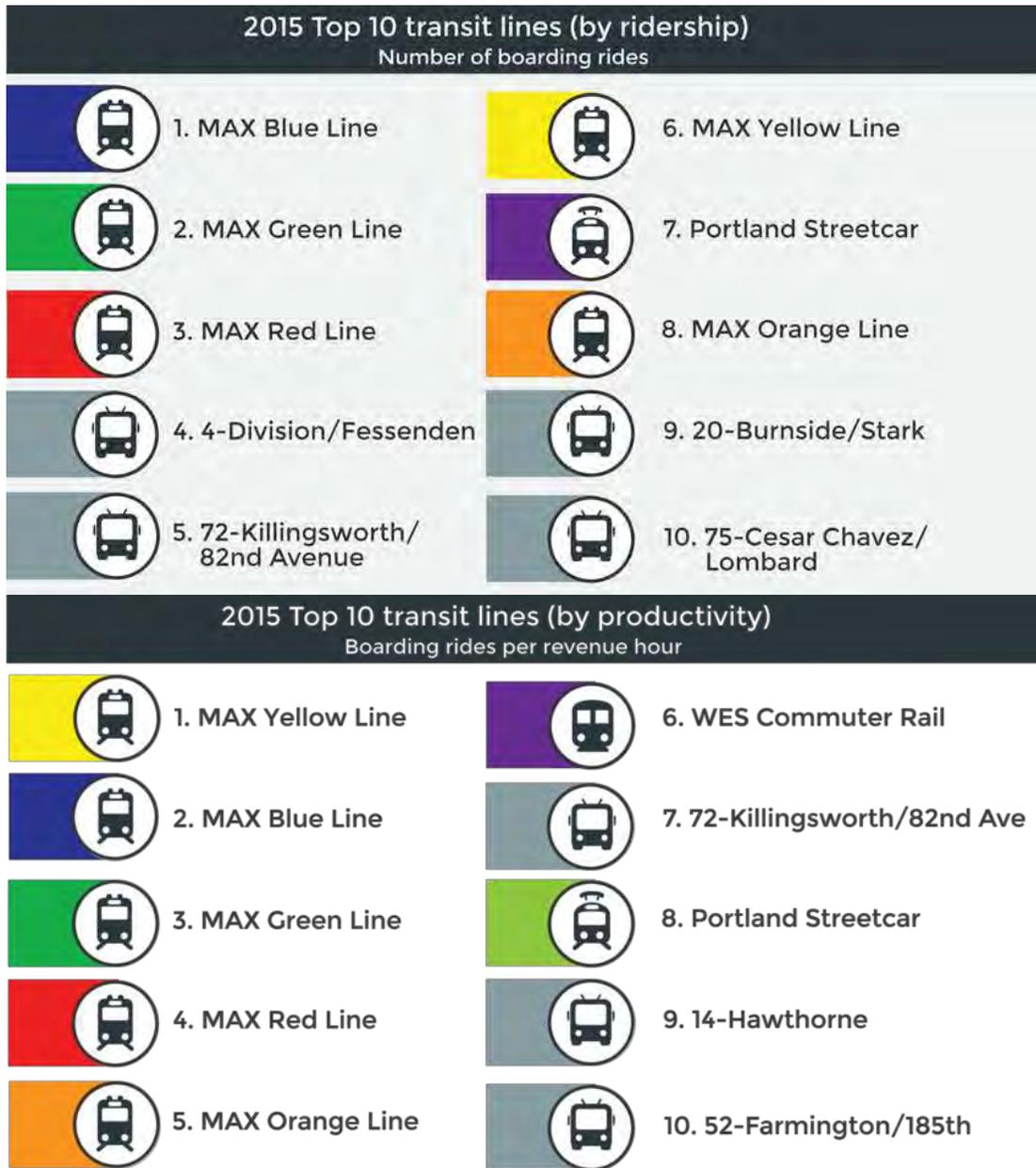


Figure 4.26 Mode share change 2005-2015



As can be seen in **Figure 4.27**, rail transit (light rail, commuter rail and streetcar) carries a big share of the region's transit passengers. For example, although the MAX network only has 88 total track miles compared to the bus network's 822 miles, MAX lines carry almost two-fifths of all transit trips. The Blue MAX line alone carries nearly 60,000 people per day.

Figure 4.27 Top Performing Transit Lines, 2015



Effectiveness of employer commuter programs and community and neighborhood programs on changing mode share

Between 1997 and 2006, the TriMet, Wilsonville SMART and transportation management association employer-outreach programs have made significant progress with reducing drive-alone trips. Since 1997, employee commute trips that used non- drive-alone modes (transit, bicycling, walking, carpooling/ vanpooling and telecommuting) rose from 20 percent to over 39 percent among participating employers.

Community outreach programs such as Portland Sunday Parkways and Wilsonville Sunday Streets encourage residents to use travel options by exploring their neighborhoods on foot and bike without competing with motorized traffic. Sunday Parkways events have attracted 119,000 participants, and the Wilsonville Sunday Streets event attracted more than 5,000 participants in 2012.

Other examples of valuable community outreach and educational programs include the Community Cycling Center's program to reduce barriers to biking and Metro's Vámonos program, both of which provide communities across the region with the skills and resources to become more active by walking, biking and using transit for their transportation needs.

In 2004, the City of Portland launched the Interstate TravelSmart individualized marketing project in conjunction with the opening of the MAX Yellow Line. Households that received individualized marketing made nearly twice as many transit trips compared to a similar group of households that did not participate in the marketing campaign. In addition, transit use increased nearly 15 percent during the SmartTrips project along the MAX Green Line in 2010. Follow-up surveys show that household travel behavior is sustained for at least two years after a project has been completed.

In 2015, a unique partnership between Metro, the City of Milwaukie and ODOT engaged residents along the last three stops of the new MAX Orange Line. More than 25 percent of residents participated in the program to learn about new travel options, resulting in a reduction of more than 1.3 million single occupant vehicle miles driven the year after the opening of the line.

Quick facts: Commuting in the Portland region

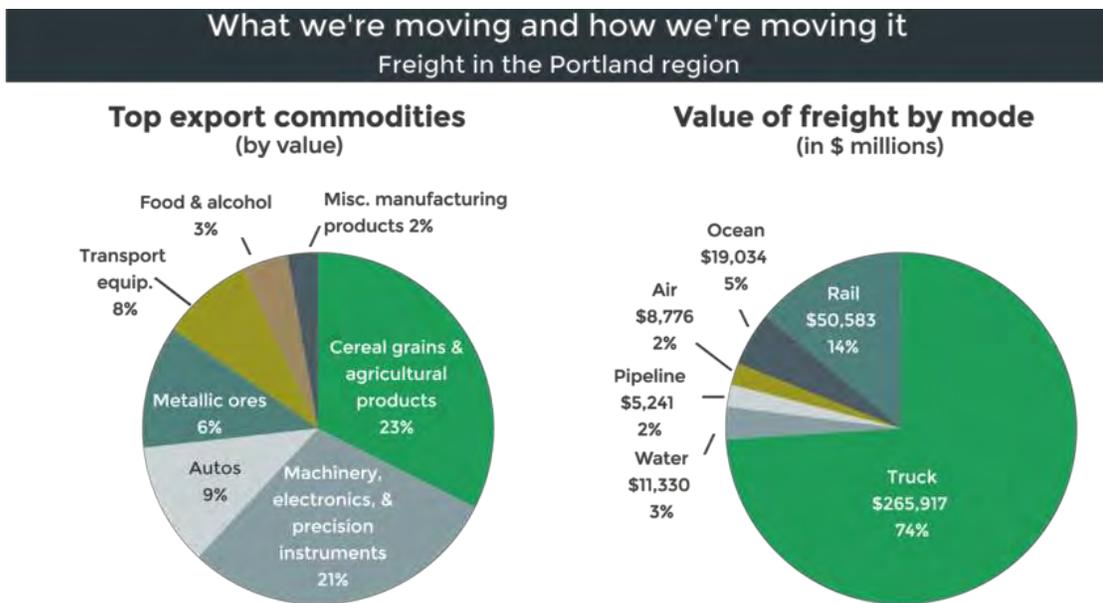
-  If we drove at the same levels we did in 2000, there'd be 34,000 more drive-alone commuters on the roads each day.
- 78% of TriMet riders are "choice" riders - they own a car but opt to use transit. 
-  Enough people bike to work each day to nearly fill Providence Park stadium.
- Working from home has taken more cars off the road than any other mode since 2000. 

4.5 HOW WE MOVE GOODS AND SERVICES

Despite a growing “buy local” movement, most of the products we buy come from someplace else and many of the goods we produce in Oregon move on to markets in other states and countries. In comparison with other U.S. metropolitan areas of similar size, Portland’s competitiveness is largely dependent on the region’s goal as a gateway and distribution center for domestic inland and international markets⁴. The global economy is expanding rapidly, and our region’s ability to move products to far-flung markets depends on an efficient transportation system.

With its location on Interstate 5, the West Coast artery of the Interstate Highway System, the greater Portland region is ideally situated to move freight by truck. But with Portland International Airport, two Class 1 railroads (mainline railroads Union Pacific and Burlington Northern/Santa Fe), the southern terminus of the 400-mile Olympic Pipeline, and a location at the confluence of two major rivers with ocean access, the region’s freight transportation system is a multimodal network.

Figure 4.28 Freight goods movement in the greater Portland region



Source: Cambridge Systematics, Port of Portland Commodity Flow Forecast, 2007 (most recent available)

The majority of the region's freight is still moved by truck as shown in **Figure 4.28**. However, as Oregon’s economy has shifted from bulk products like farm exports and timber to lighter products like semiconductors, electronics and specialized machinery, the region is moving fewer tons of goods around. But these lightweight products are higher-valued – as a result, the overall value of freight exports increased by 55 percent between 2007 and 2012.

⁴ Cost of congestion to the Economy of the Portland Region, November 2015

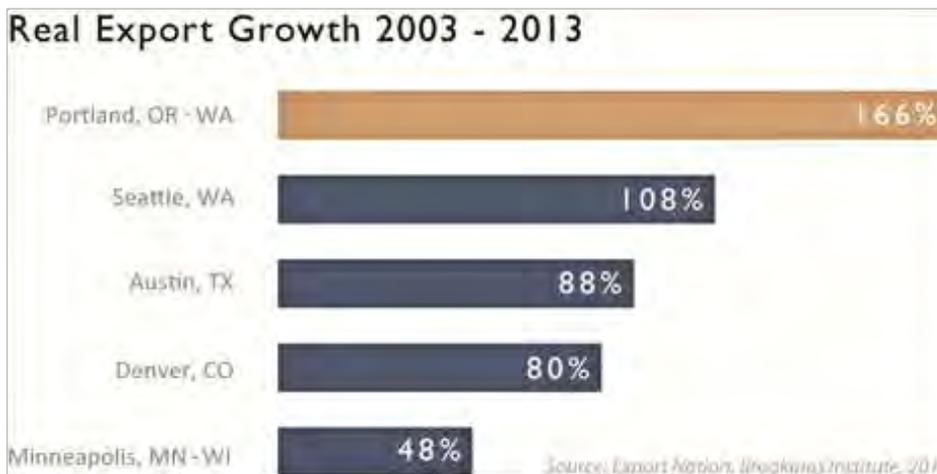
Figure 4.29 Freight weight to value, 2007-2012



Source: 2012 Commodity Flow Survey, US Census. Courtesy Joe Cortright, City Observatory 2016

Exports are at the core of the Portland’s Metro Service Area (MSA) economy. Between 2003 and 2013, the greater Portland region increased its export volume by 166 percent, creating 39,374 direct new jobs for the region. This growth made the greater Portland region the fifth-fastest growing export market among the 100 largest metropolitan areas. In 2013, the region was 13th largest in the U.S. by export volume, with \$26.7 billion in exports.⁵

Figure 4.30 Real export growth, 2003-2013



⁵ Global Trade and Investment Plan – Greater Portland Global, March 2015

4.5.1 Competing in a global economy

“Traded sector” industries that bring new money into the region and enable the rest of the economy to prosper, require an efficient transportation system. Portland’s economy depends on industries that could locate elsewhere, but have been attracted to the area because of its advantageous trading position. Those industries include semiconductor manufacturers, computer and electronics equipment, wood products, metal products, tourism, publishing, and wholesale distribution activities. Because traded industries depend on the movement of freight, reasonably good transportation access must be maintained if those industries are to remain and grow and in the Portland area in the years to come.

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 and international competition exists. As a result of their exchange earnings, these industries increase spending power within their region or state.

Traded sector industries are the primary enabler of Portland metropolitan economic growth. The Portland region’s traded sector industries are anchored by six core clusters.⁶ These industries are important drivers of regional economic activity today and well-positioned to spark future growth.

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.

⁶ Portland Economic Value Atlas Market Scan (The Brookings Institute) August 2017

4.6 HOW WE KEEP OUR ENVIRONMENT HEALTHY

Choices about how we get around, where we live, and our economy all impact the health of our environment. Metro and the RTP have a role, in partnership with federal, state and local partners in developing and implementing plans and policies that keep our air, water and land healthy for generations to come.

Air quality

Overall, concentrations of **criteria air pollutants** in the greater Portland region have decreased dramatically over the last 30 years. Through a mix of industrial emissions regulations and transportation emissions reduction strategies, the greater Portland region successfully reduced lead, carbon monoxide and ozone (smog) to meet and maintain federal clean air standards. In October 2017, the region completed the last of its obligations under the Clean Air Act for previous violations of federal air pollution standards.

However, compared to other areas in Oregon, the greater Portland region has the highest risk to the population from **air toxics** due to business and population density. Along with national estimates of air toxics emissions, Portland monitoring studies confirm the presence of air toxics at levels that can cause adverse health effects.⁷ A 2012 Oregon Department of Environmental Quality study identified 14 of the 19 pollutants above health-based benchmarks. Eight of the 14 pollutants cause the most risk. While the study shows that most air toxics are found throughout the study area, higher concentrations are found in densely populated neighborhoods, near busy roads and highways and in areas with business and industrial activity.⁸ Low-income neighborhoods, tribal populations and communities of color that live in urban areas may be disproportionately exposed to air pollution, which is a barrier to economic opportunity and security.

The Oregon Department of Environmental Quality is continuing to work with Metro and other stakeholders to address localized hotspot pollution from light and heavy

Defining terms

Air quality

The degree to which the ambient air is pollution-free, assessed by measuring a number of indicators of pollution.

Criteria air pollutants

Carbon monoxide, lead, ground-level ozone, nitrogen dioxide, particulate matter, and sulfur dioxide. Criteria pollutants are the only air pollutants with national air quality standards that define allowable concentrations of these substances in ambient air.

Air toxics

Also known as toxic air pollutants or hazardous air pollutants, are those pollutants that cause or may cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental and ecological effects.

Greenhouse gases

Greenhouse gases - The six gases identified in the Kyoto Protocol and by the Oregon Greenhouse Gas Mandatory Reporting Advisory Committee as contributing to global warming: carbon dioxide (CO₂), nitrous oxide (N₂), methane (CH₄), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆).

⁷ Portland Air Toxics Solutions Committee Report and Recommendations, Oregon Department of Environmental Quality, April 2012

⁸ Ibid

duty vehicle emissions.

Metro's Climate Smart Strategy responds to a state mandate to develop and implement a strategy to reduce per capita **greenhouse gas emissions** from cars and small trucks by 2035. In December 2014, after a four-year collaborative process, the Metro region adopted a Climate Smart Strategy that achieves a 29 percent reduction in per capita greenhouse gas emissions, which exceeds the state mandated target.⁹ The strategy does more than just exceed the state mandated target; it also supports job creation and economic development, saves businesses and household money, helps people live healthier lives, protects clean air and water, and makes the most of the investments already made in the region's transportation system.

The strategy relies on adopted local and regional land use and transportation plans and expected advancements in cleaner, low carbon fuels and more fuel-efficient vehicles. The strategy includes nine key policies that are reflected in Chapter 3.

Habitat

Without appropriate intervention and mitigation, transportation corridors create barriers and hazards in wildlife corridors and fish passageways. About 13 percent of the region is covered by developed land such as pavement and buildings.¹⁰ Several Metro-initiated activities are aimed at restoring habitat or mitigating the effects of the transportation system on the natural environment.

Development of the Regional Conservation Strategy for the Greater Portland-Vancouver Region reflects an ongoing effort to maintain an inventory of regionally significant fish and wildlife habitat and map ecologically sensitive areas for informing potential environmental impacts of transportation projects. The inventory is used in the RTP to identify and flag future transportation projects that overlap with sensitive fish and wildlife habitat in order to plan for, prevent or mitigate negative impacts.

It is the goal of the Regional Conservation Strategy to manage the region's resources in a way that does the following:

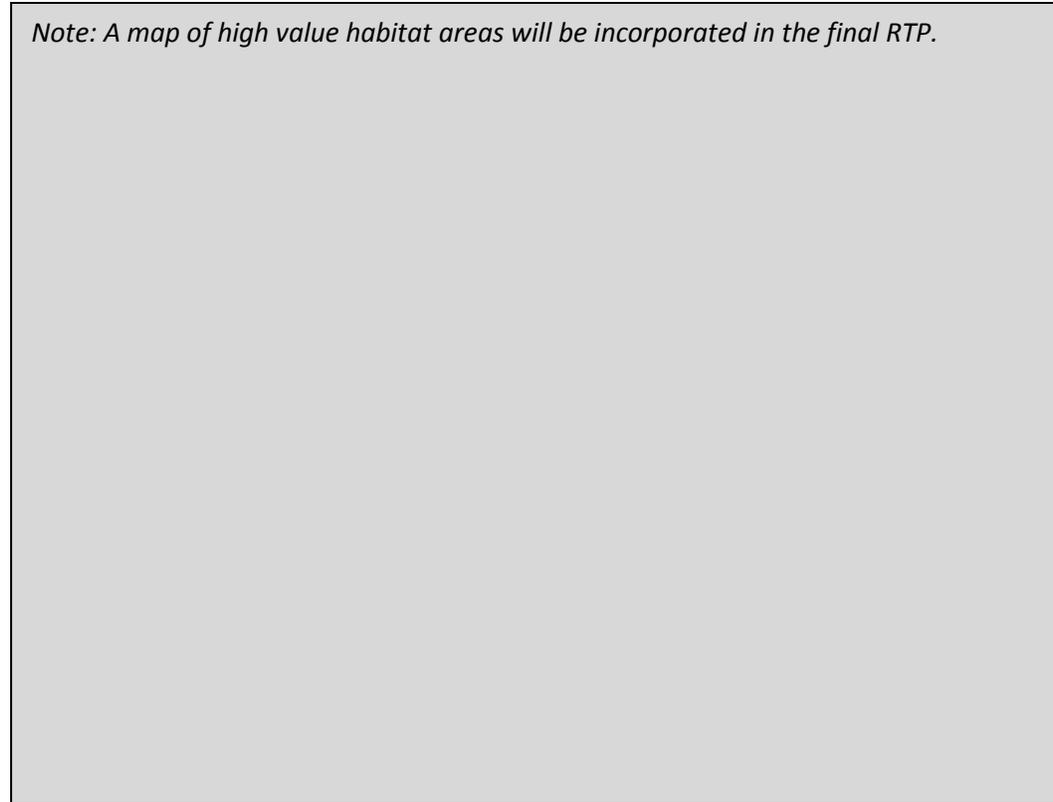
- Protects the water and air quality of the region
- Provides other important ecosystem services, such as flood control, water storage, and pollination
- Supports—at a minimum—the current level of biodiversity (i.e., the existing range of plants, animals, and wildlife habitats)
- Helps species and habitats recover from historical losses or degradation
- Increases natural systems' resilience and their ability to adapt to an unpredictably changing climate

⁹ Climate Smart Strategy for the Portland metropolitan region, Metro, 2014

¹⁰ Regional Conservation Strategy for the Greater Portland-Vancouver Region

- Provides opportunities for people to access natural areas for local recreation, research, and appreciation

Figure 4.31



Metro’s Parks and Natural Areas Program acquires land to protect habitat and water quality and conduct ongoing performance monitoring of habitat and watershed health.

Metro’s design guidance for streets and regional trails provides best practices to create livable streets that mitigate the negative impacts of transportation on water, air and habitat. The design guidelines were first developed in 2002. The Creating Livable Streets, Green Streets and Trees for Green Streets handbooks are currently being updated to reflect best practices associated with street design to lessen impacts on habitat and ecosystems and will include regional trail design guidance, in addition to the current Wildlife Crossings and Green Trails handbooks. Additionally, the Regional Active Transportation Plan provides Top 10 Natural Resource Considerations for Trail Planners. This set of considerations is provided to local jurisdictions that receive funding from Metro for regional trails and reflect best practices to protect habitat.

Future work by Metro and partners could include an inventory of culverts in the region that need repair or replacement to accommodate endangered or threatened fish species.

4.7 HOW THE SYSTEM IS WORKING – CHALLENGES AND OPPORTUNITIES AHEAD

Regional transportation challenges were identified through the engagement process during the update of the RTP. The regional investment strategy was developed to address these challenges.

- Aging infrastructure
- Climate change and air quality
- Congestion and reliability
- Fatal and life-changing crashes
- Earthquake vulnerability, security and emergency management
- Gaps in transit, biking and walking connections
- Social inequity and disparities
- Housing and transportation affordability and displacement
- Technological change

4.7.1 Funding

Today the federal government is investing less in infrastructure than ever before. While budgets are shrinking, aging roads and bridges are operating beyond capacity, and our transit systems lack funding to expand. Traditional approaches to financing transportation projects are not only failing to maintain existing infrastructure, they are wholly inadequate to build new systems to accommodate growth and keep our economy moving.

Oregon auto taxes and fees are the lowest in the nation according to Bankrate.com's most recent Car Cost index which lists the annual costs of car ownership for all 50 states. In 2014, Oregon's annual average cost for car ownership was about 31 percent lower than the national average. The largest difference in vehicle costs was for taxes and fees, which the index estimated to be \$157 a year, about 85 percent lower than the national average of \$1,058.

As of January 2018, Oregon automobile related taxes are the lowest among our neighboring western states as summarized below. The table does not include the federal excise gas tax of 18.4 cents per gallon.

Table 4.32 Comparison of Automobile Related Taxes

Tax (cents per gallon units)	OR	MT	ID	UT	NV	WA	CA
State gas excise tax	34.1¢	32.3¢	32.0¢	29.4¢	23.0¢	49.4¢	41.7¢
Gas sales & local option taxes	2.5¢	0¢	1.0¢	0¢	10.8¢	0¢	16.6¢
Registration fees	11.8¢	20.0¢	9.3¢	9.5¢	6.8¢	16.8¢	19.6¢
Ad valorem taxes	0¢	4.0¢	0¢	10.0¢	31.2¢	13.1¢	16.2¢
Auto sales taxes	4.0¢	0¢	38.4¢	43.8¢	51.2¢	60.8¢	54.4¢
Title & related fees	3.7¢	0.5¢	0.6¢	0.2¢	1.2¢	2.7¢	0.9¢
Total cents per gallon	56.1¢	56.8¢	81.3¢	92.9¢	124.2¢	142.6¢	149.3

Source: Oregon Department of Transportation (January 2018)

Note: An infographic of the table above will be incorporated in the final RTP.

Over the next two decades, the gap is expected to grow between the revenues we have and the investments we need just to keep our bridges, roads and transit systems in their current condition, to say nothing of addressing new needs. Current sources of transit funding are not enough to support the system expansions needed to serve its rapidly growing ridership.

4.7.2 Aging infrastructure – maintaining the system we have

The region’s aging infrastructure is deteriorating and requires more maintenance than ever before, similar to other cities and regions across the country. In its 2013 Report Card for America’s Infrastructure, the American Society of Civil Engineers gave America a D for roads, stating that 32 percent of the nation’s roads are in poor or mediocre condition.¹¹ The Oregon Department of Transportation, cities, and counties devote nearly all existing state and federal gas tax revenues to operation and maintenance of the existing road system. The federal fuel tax stands at 18.4 cents per gallon on gasoline and 24.4 cents per gallon for diesel; however the tax has not been increased since 1993, when gas was consistently under \$1.20 per gallon. If the tax has been indexed to inflation it would be about 30 cents per gallon now.¹²

Comprehensive maintenance data for the region is not currently available. The City Club of Portland estimated that the City of Portland needs at least \$50 million per year to keep streets from falling into further disrepair, at least \$75 million per year to repair streets that have fallen into disrepair, and at least \$80 million per year to repair and construct safety projects that benefit all mode of transportation for a total of \$205 million per year.¹³ It is clear that the region needs to address this growing problem. Cities across the nation

¹¹ Portland’s Streets, End the Funding Gridlock, City Club of Portland Bulletin, Vol. 98, No. 8, September 9, 2015

¹² Ibid

¹³ Ibid

have taken various approaches to raising local revenue, including numerous cities in the region including Hillsboro, West Linn, Lake Oswego and Sherwood. Currently leaders in the region are discussing options for regional funding, although it is clear there is no silver bullet that will solve the transportation funding problem.

4.7.3 Climate change and air quality

Climate change is the defining global challenge of the 21st century. Global climate change poses a growing threat to our environment, public health and our economy, and creates uncertainties for the region.

Documented effects of climate change include: extreme weather events, increase in average annual air temperatures and likelihood of extreme heat events, changes in hydrology, water supply and stream flows, rising sea levels, reduced water quality, changes in wetland ecosystems, increase in breeding grounds for water-borne diseases, shifting rainfall patterns, reduced air quality, increase in wildfire frequency and intensity, increased incidents of landslides, shifts in quality of habitat, shifts in migration patterns and habitat range, and changes to growing seasons such as increased incidents of short-term drought, and the distribution of plants and animals.

Climate change impacts will impact the service life of transportation infrastructure and the more severe storms that are predicted will increase the frequency of flooding and landslides. Consequent damage to roads, bridges and rail infrastructure will compromise system safety, disrupt mobility and hurt the region's economic competitiveness.

Our ability to respond, not just as the Portland region but as a state, will have unprecedented impact on our lives and our survival. The Oregon Sustainable Transportation Initiative (OSTI) is an integrated statewide effort to reduce greenhouse gas (GHG) emissions from transportation while creating healthier, more livable communities and greater economic opportunity. A component of this initiative is the Oregon Statewide Transportation Strategy (STS): A 2050 vision for Greenhouse Gas Emissions Reductions. The STS describes what it would take for the transportation sector to get as close as possible to the 2050 goal of a 75 percent reduction below 1990 levels of greenhouse gas emissions.¹⁴

¹⁴ Oregon Statewide Transportation Strategy: A 2050 Vision for Greenhouse Gas Emissions Reduction, Volume 1, Oregon Department of Transportation, March 20 2013

The STS focuses on prevention and mitigation of climate impacts, not adoption activities. It is neither directive nor regulatory, but identifies promising approaches for further consideration by policymakers at the national, state, regional, and local levels without assigning responsibility for implementation. The path forward for the greater Portland region, as well as the state as whole, will continue to evolve as more planning and analysis work is completed in the future.

The goal of the region’s Climate Smart Strategy is to demonstrate leadership on climate change by meeting adopted targets for reducing greenhouse gas emissions from light-duty vehicles while creating healthy and equitable communities and a strong economy. Adopted by JPACT and the Metro Council in 2014 with broad support, the strategy is built from the land use and transportation plans and visions already adopted by local jurisdictions across the region, creating a diverse and shared vision. It includes making investment to increase active transportation, increase transit and use technology and other strategies to improve safety, reduce traffic delay and make the most of investments we already made in our transportation system.¹⁵

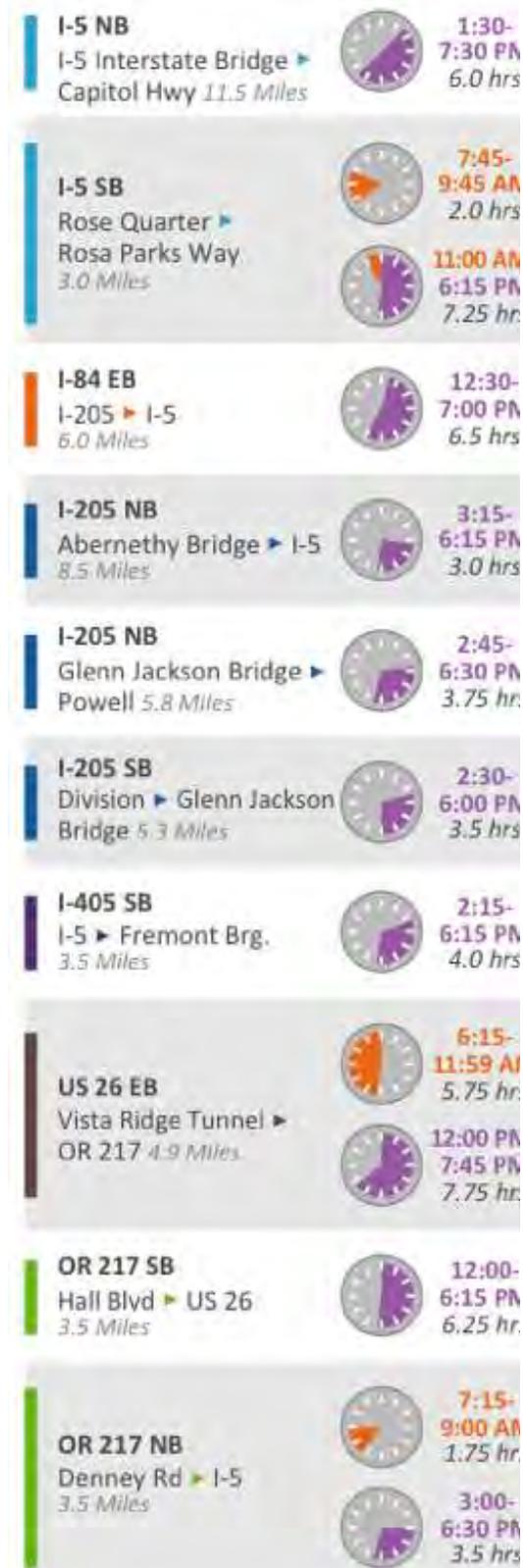
4.7.4 Congestion and reliability

Congestion has many causes, but mostly results from too much traffic for the physical capacity of a road to handle (bottlenecks) or periodic events like crashes, vehicle breakdowns, road work, storms and special events (parades, major sporting events). For drivers, this is usually described as routine congestion, which typically occurs daily, versus traffic incidents that are unexpected and difficult to predict.

Drivers can usually plan their day around routine congestion and the typical bottlenecks. Much of the throughway system (our major highways and

Top recurring bottlenecks, 2015

Sources: FHWA, NPMRD, ODOT



¹⁵ Climate Smart Strategy for the Portland metropolitan region,

freeways) is routinely congested during the morning and evening rush hour, and drivers know their trip will be slower during this period. But the traffic incidents and other non-routine events are difficult to plan for, and make it more difficult for drivers to plan commutes or for businesses to plan shipments.

Focusing on system reliability

For this reason, efforts to address congestion in our growing region have started to focus on improving reliability, or the degree to which congestion in a given travel corridor is affected by these non-routine events. Reliability is about predictability and dependability – and being able to count on knowing about how long it will take to get to school, work or activities. Improving reliability means that travelers don't have to budget as much extra time in order to arrive on time at their destinations, even when routine congestion exists on our major throughways.

ODOT report shows growth in congestion

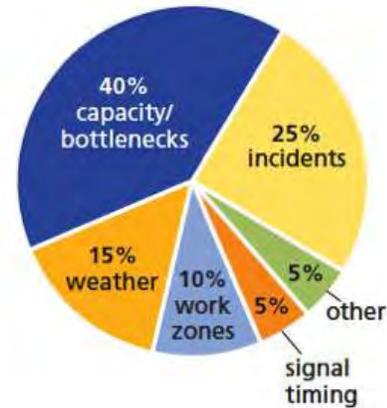
ODOT's *2016 Traffic Performance Report* shows what many of us have experienced: traffic congestion in the greater Portland region today can occur at any time of the day or week, and is no longer only a weekday peak hour problem. In 2013, about 11 percent of all travel in the greater Portland region occurred during congested periods. This increased to nearly 14 percent in 2015. This increase in congestion is a reflection of the both the region's continued growth, including our substantial economic rebound from the Great Recession that began in 2008.

Data from the ODOT report for the region's six major throughways (Interstate 5, Interstate 84, Interstate 205, Interstate 405, U.S. 26 and OR 217) shows increasing congestion, decreasing travel speeds, greater delays and unreliable trip times on these major travel routes. The graphic to the right identifies the top recurring bottlenecks in the region.

Congestion on these routes also affects freight in the region, as most of our local goods move by truck today, a trend that is expected in future. With congestion beginning to spread beyond commute periods and into the off-peak in the middle of the day, the ability to move freight during this relatively congestion-free period is being impacted. As the mid-day becomes more unreliable, freight in our region is having more problems meeting delivery schedules, and the cost of shipping is increasing. These shipping costs are typically passed on to businesses and consumers, and could impact the region's competitiveness in the global economy.

Did you know?

Causes of congestion in the greater Portland region

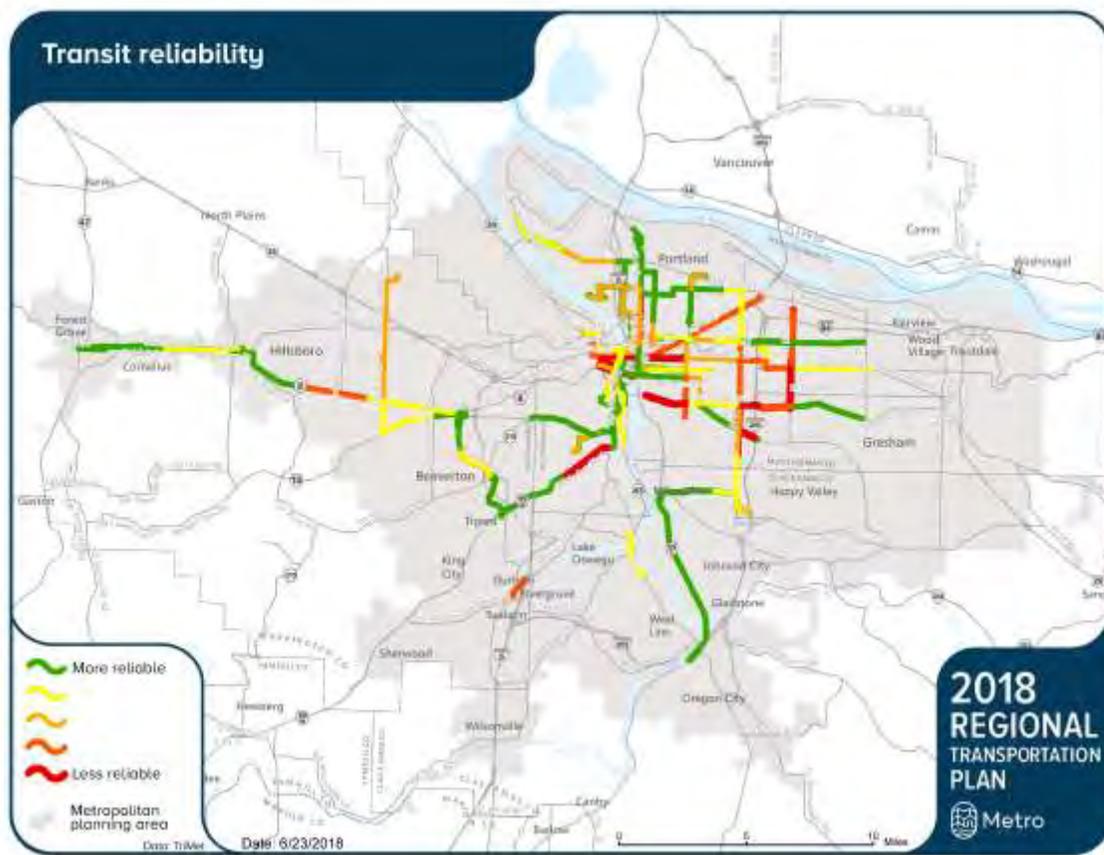


More than half of all congestion is caused by crashes, breakdowns and other causes that can be addressed using system management and operational strategies.

Congestion is also affecting the speed and reliability of transit throughout the region

The ODOT report also found that crashes on our throughways are increasing at a rate equal to the increase in congestion, but shows that recent ODOT investments in traveler information signage and adding auxiliary lanes have slowed the rate of crashes at specific bottleneck locations. While not a long-term solution for growing congestion, an auxiliary lane adds capacity in the form of a dedicated lane from an on-ramp to the next off-ramp, helping to reduce crashes caused by drivers merging and weaving between exits.

Figure 4.33 Transit reliability in the greater Portland region



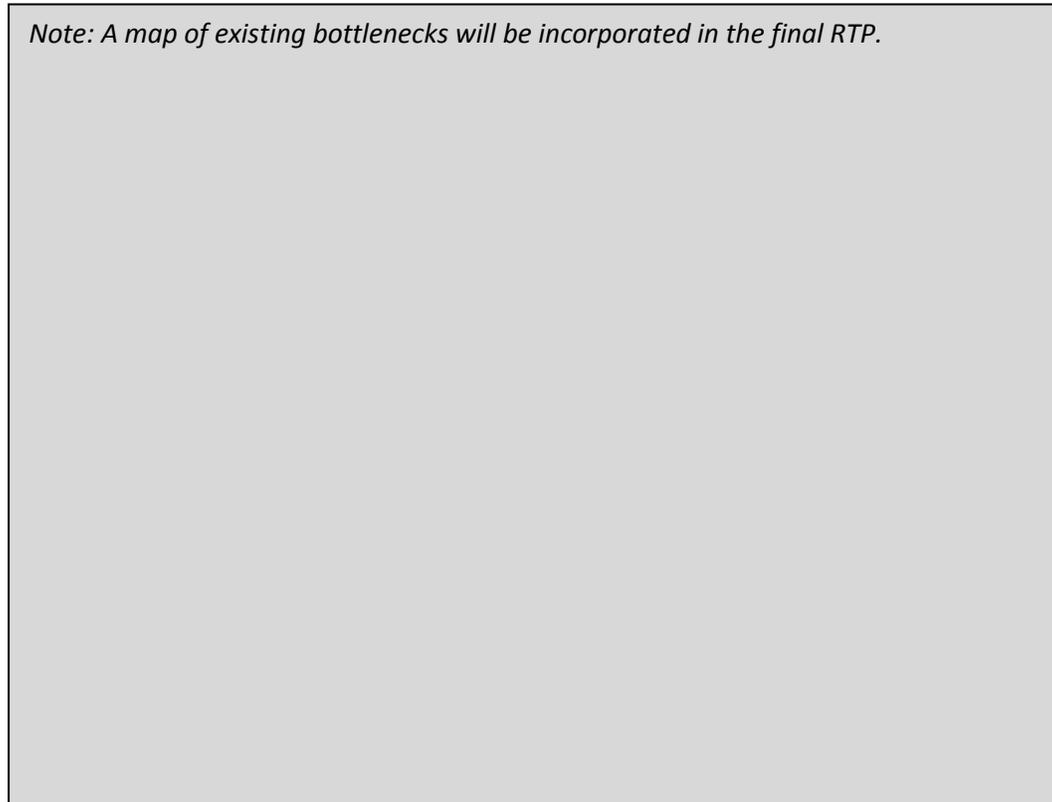
Oregon Legislature commits to addressing congestion in the greater Portland region

In 2017, the Oregon Legislature approved HB 2017 (discussed in the next section), which provides funding for additional targeted safety and congestion projects that can help address the issues found in the ODOT report. The Legislature also directed the Oregon Transportation Commission (OTC) to develop a proposal for value pricing on I-5 and I-205 from the Columbia River to the junction of the two freeways in the southern part of the region, with the stated purpose of reducing congestion. The OTC must seek approval from the Federal Highway Administration to implement value pricing no later than December

31, 2018. If FHWA approves, the commission is required to implement value pricing. An ODOT-led study is underway to meet this deadline.

According to rankings released in March 2016 by INRIX, a transportation tracking company, the Portland region’s major congestion hotspots are those highways leading to and from downtown Portland, the southern tier highways as well as the two interstate connections to Washington, as seen below.

Figure 4.34 Bottlenecks in the greater Portland region



Note: A map of existing bottlenecks will be incorporated in the final RTP.

In 2014, Texas A&M’s annual Urban Mobility Scorecard showed the Portland area tied with Austin, Miami, Detroit and Atlanta for 12th place out of 101 regions in yearly delay per auto commuter. The delay per auto commuter is reported as 52 hours per year – exactly the average amount of delay for all 101 cities in the study. The cost of our region’s congestion to truck freight was ranked at 16th out of 101 regions, with an estimated annual cost of \$375 million.¹⁶

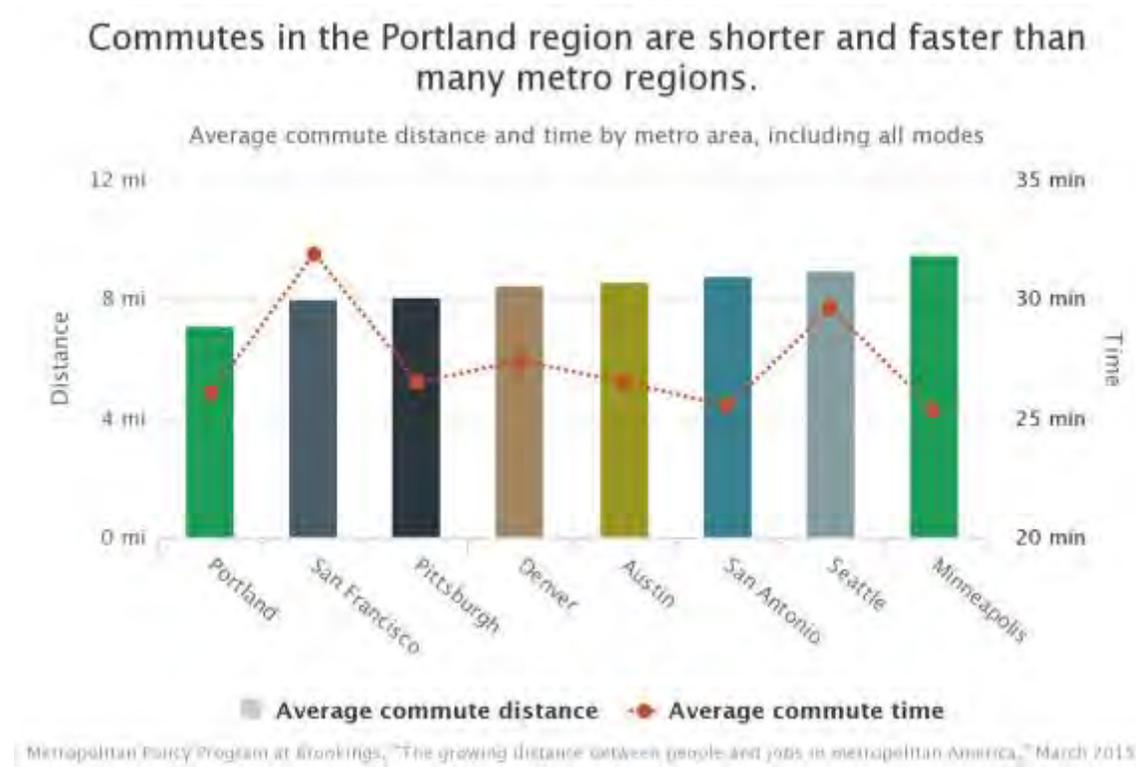
Despite such delays, we spend less time commuting to work than people in most other regions. In 2014 the average commute was 26 minutes – about a minute longer than in 2010¹⁷. The Portland region is tied for fifth-best metro area in the nation for the share of

¹⁶ Texas A&M Transportation Institute 2015 Urban Mobility Scorecard

¹⁷ 2014 American Community Survey 1-Year Estimates, Means of Transportation to Work by Selected Characteristics

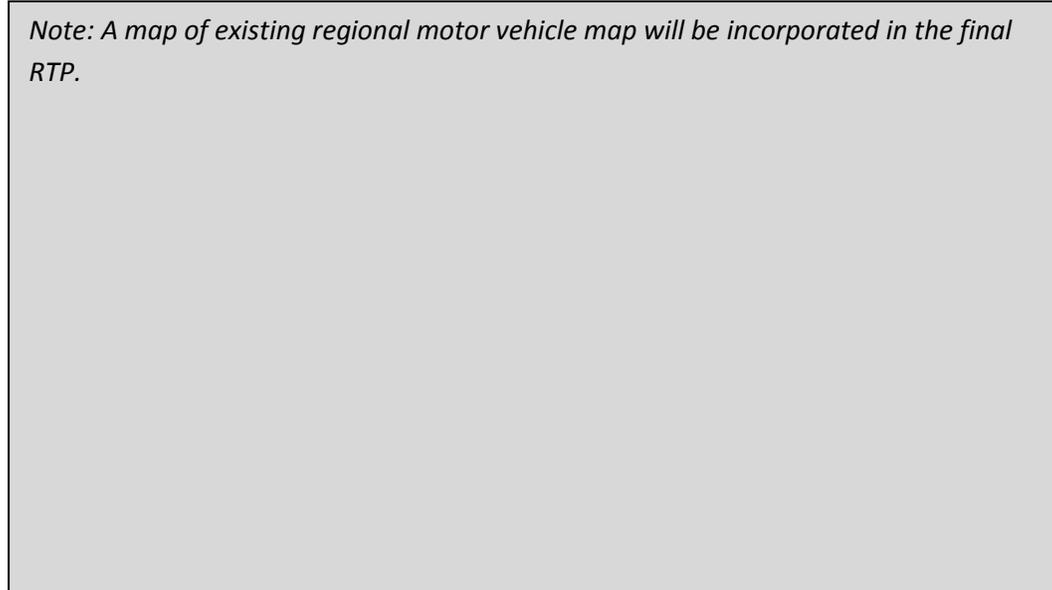
people with a 30-minute commute or better – nearly two-thirds of commuters in the region have a commute under a half-hour. In part that’s because people here don’t have to travel as far to get to work. The average commute distance in the region is just 7.1 miles.

Figure 4.35 Average commute distance and time for metropolitan areas



Metro maintains the Congestion Management Process (CMP) for the Portland metropolitan region as required by federal law. The CMP includes a performance management system that informs needed capital investments, such as new or improved transit and road capacity as well as demand and system management strategies to improve performance of the existing infrastructure. The Regional Transportation Plan calls for strategic widening of existing roads and throughways to address bottlenecks, increasing street network connectivity, expanding travel options, and using system and demand management strategies to help improve reliability and better connect goods to market and support travel across the region. The CMP is described more in Chapter 8.

Figure 4.36 Regional motor vehicle existing system map



4.7.5 Fatal and life-changing crashes

Traffic safety affects the greater Portland region on multiple levels. Crashes cause personal tragedy, lost productivity, rising insurance costs, congestion and delay to the movement of people and goods. In addition, safety concerns may prevent people from choosing to walk or bike rather than driving a car. Increasing awareness of safety issues is a first step to improving safety in the region. Efforts to improve transportation safety generally center on preventing traffic crashes that result in severe injury or death.

Traffic related deaths and severe injuries are a critical and preventable public health and social equity issue in the greater Portland region. Between 2011 and 2015, there were more than 116,000 traffic crashes resulting in 311 deaths and 2,102 people severely injured.¹⁸ **Figure 4.35** provides a map showing the location of fatal and life-changing injuries in the greater Portland region between 2011 and 2015.

Traffic crashes are the leading cause of unintentional injury death for young people ages 5 to 24 in Multnomah, Washington and Clackamas County, and the second leading cause of unintentional injury death for people ages 25 to 84.¹⁹

On average, 62 people die each year on the region's roadways and 420 people experience a life changing injury. Nearly two people are either killed or severely injured every day in our

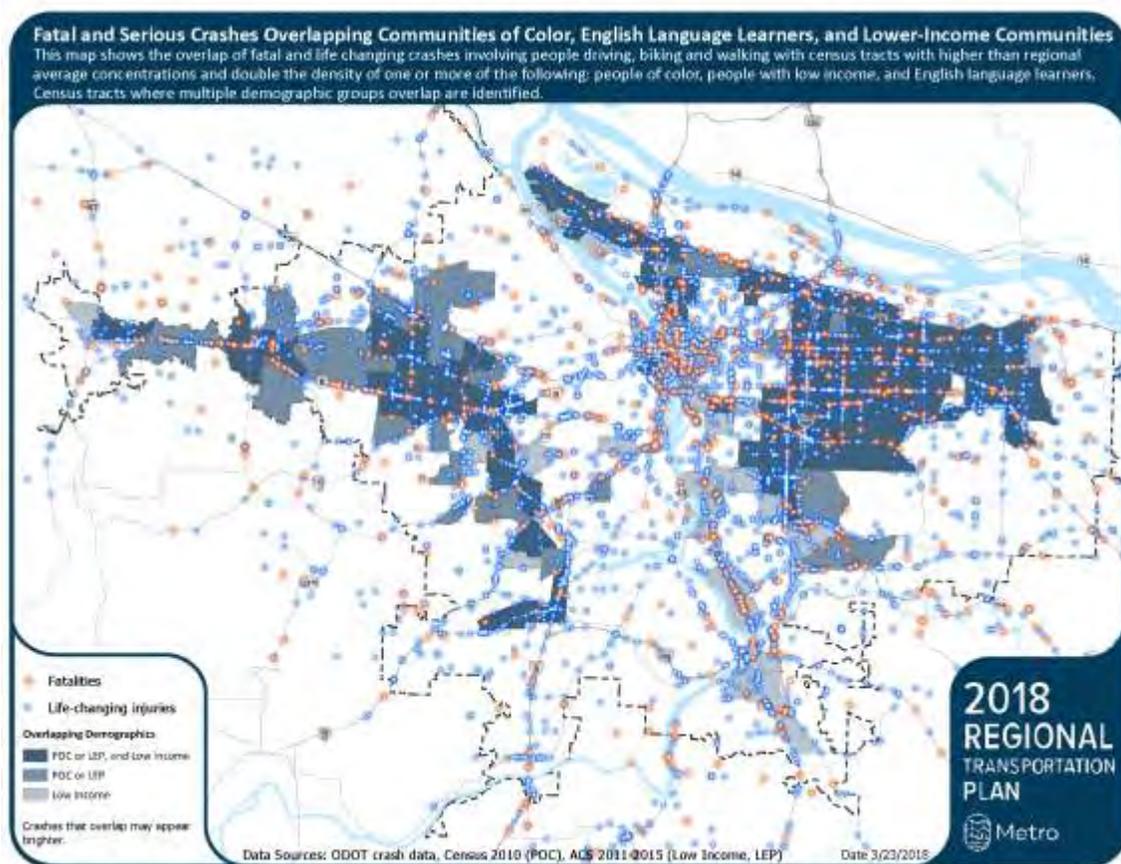
¹⁸ 2018 Metro State of Safety Report

¹⁹ Oregon Death Certificates: Center for Health Statistics, Center for Public Health Practice, Public Health Division, Oregon Health Authority. Accessed March 13, 2018. For 2012-2016. Unintentional injuries were the 4th leading cause of death (just about tied for third with cerebrovascular disease/stroke); within the category of unintentional injury deaths, transport injuries are the third leading cause behind falls and poisoning (poisoning includes drug overdoses).

region in a traffic crash; every 10 days a person riding a bike is killed or severely injured; every 5 days a person walking is killed or severely injured.

Sixty percent of these fatal and severe injury crashes occur on just 6 percent of the region's major streets. These roadways are identified in this document as Regional High Injury Corridors and Intersections. They are also where we tend to travel the most, where we run to catch the bus, cross the street to get to schools and shops, ride our bikes or drive. Refer to Chapter 3 for a map of Regional High Injury Corridors and Intersections.

Figure 4.37 Fatal and life changing injuries in the greater Portland region, 2011-2015



Analysis in the 2018 Metro State of Safety Report and the Regional Transportation Safety Strategy identified the top three challenges that the region faces in eliminating fatal and life-changing injuries:

Traffic deaths are increasing and are disproportionately impacting people of color, people with low incomes and people over age 65

- Serious crashes (fatal and severe injury crashes combined) have fluctuated since 2007, but more recently have been increasing. Initial data from 2016, 2017 and 2018 indicate that the trend is continuing. This is a trend that is also happening at the state and national levels.

- The regional annual fatality rate by population and vehicle miles traveled (for 2011-2015) has increased compared to the 2012 Metro State of Safety Report.²⁰
- Your risk of dying in a motor-vehicle involved crash is higher if you are a person of color, are over 65 or have a lower income.²¹
- A majority of Regional High Injury Corridors are in communities with higher densities of people of color, people with low incomes and English language learners.²²
- A majority of pedestrian deaths are in are in communities with higher densities of people of color, people with low incomes and English language learners.
- Older drivers are twice as likely to die in a traffic crash. For male drivers age 70 to 79 and female drivers age 75 to 85 and older the share of serious crashes is double that of drivers in other age groups.
- In Oregon, American Indians/Alaska Natives have the highest average rate of vehicle related deaths (5.9 per 100,000) 1.8 times the rate among whites (3.3 per 100,000), and American Indians/Alaska Natives and Black or African American had the highest hospitalization rate -52.2 and 46.2 per 100,000, compared to 45.5 for whites and 20.8 Asian Pacific Islander for traffic related injuries.²³ This data is not currently available at the regional level.

Traffic deaths are disproportionately impacting people walking

- Auto-only crashes comprise ninety-one percent of all crashes, and thirty-eight percent of all fatal crashes. Pedestrian crashes make up two percent of all crashes, and thirty-six percent of all fatal crashes.
- Pedestrian traffic deaths are steadily increasing, are the most common type of fatal crash, and have the highest severity of any crash type.
- Pedestrian fatalities have steadily increased to 2015 at the local, regional, state and national levels.
- In the region, a pedestrian crash is more than 26 times as likely to be fatal than a crash not involving a pedestrian, and more than 110 times as likely to be fatal as a rear end crash, the most common crash type.

²⁰ Fatality rates for traffic related crashes are the proportion of all crashes, person deaths or severe injuries for every 1 million people or every 100 million vehicle miles traveled.

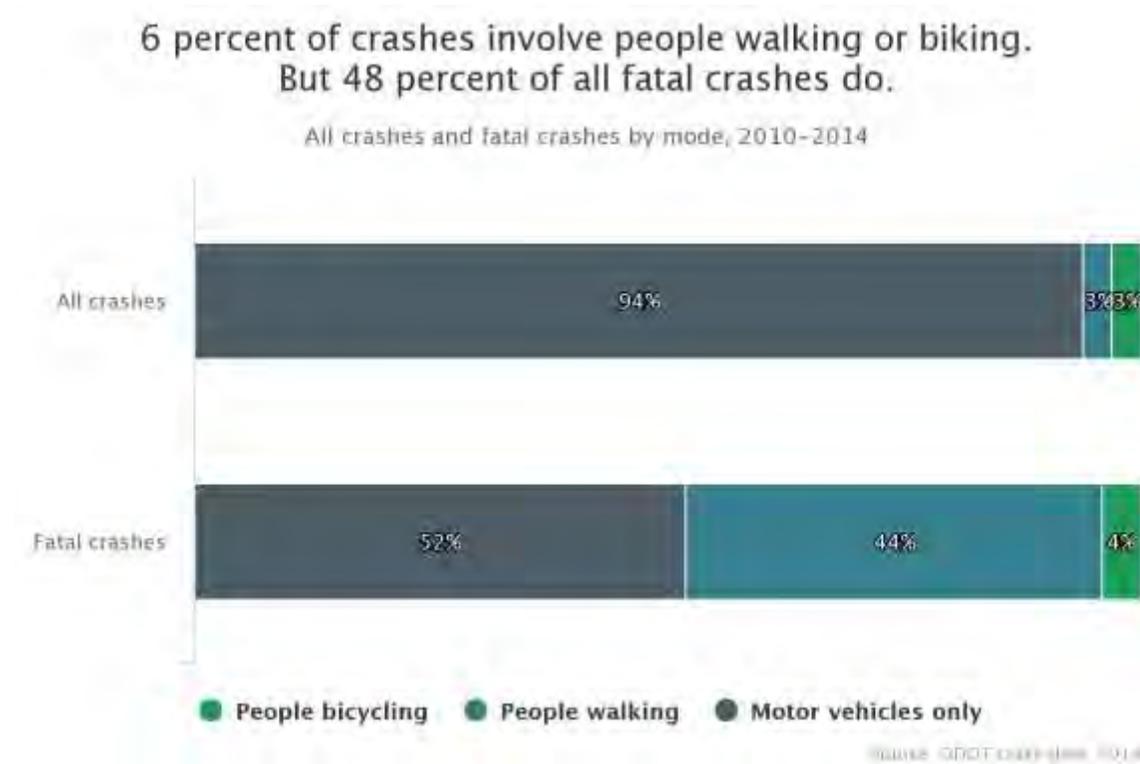
²¹ *Motor Vehicle Traffic-Related Pedestrian Deaths — United States, 2001–2010*, Centers for Disease Control and Prevention (2013); *Dangerous by Design*, National Complete Streets Coalition (2016); *Income Disparities in Street features that Encourage Walking*, Bridging the Gap (2012); *Pedestrians Dying at Disproportionate Rates in America's Poorer Neighborhoods*, Governing, August 2014; *America's Poorer Neighborhoods Plagued by Pedestrian Deaths*, Governing Research Report (August 2014)

²² The map at the end of this section shows the overlap of Regional High Injury Corridors and census tracts with both higher than regional average concentration and double the regional density of people of color, people with low income, and/or English language learners.

²³ Oregon Public Health Authority, 2008-2014 crashes

- Roadway design is critical to pedestrian safety. Seventy-seven percent of serious pedestrian crashes occur on arterial roadways in the region. This pattern is seen at the state level as well.

Figure 4.38 Percent of fatal crashes for people walking and bicycling, 2010-2014



A majority of traffic deaths are occurring on a subset of arterial roadways

- Arterial roadways are the location of the majority of the serious crashes in the region. Sixty-six percent of all serious crashes occur on a roadway designated as an arterial.
- In the region, seventy-three percent of non-freeway serious crashes occur on a roadway designated as an arterial; seventy-seven percent of serious pedestrian crashes occur on a roadway designated as an arterial; sixty-five percent of serious bicycle crashes occur on a roadway designated as an arterial.
- A majority of Regional High Injury Corridors are arterial roadways.
- A majority of the High Injury Corridors and Intersections – and a majority of pedestrian deaths and severe injuries – are in areas with race and income marginalized communities.

Several factors influence the number and severity of injuries from crashes, but some factors stand out from the rest. User behavior is a contributing factor in nearly every crash, from alcohol or drugs to excessive speed and aggressive driving. Driver inattention

also plays a major role, although it is difficult to accurately measure its impact. And even as technology has made driving much safer in many respects, it has introduced new challenges. Distracted driving has increased in step with the proliferation of cell phones in society, introducing a relatively new hazard onto the roadways. A 2016 study by the Oregon Department of Transportation shows that between 2000 and 2014, distracted driving contributed to a crash every 2.5 hours and a traffic-related injury every three hours.²⁴

A disproportionate amount of serious crashes occur on arterial streets – high-speed, high-volume streets that have four or more lanes. Per mile travelled, arterial and collector roadways experience more serious crashes than freeways and their ramps. Although these arterials make up only 6 percent of the region’s roads, 73 percent of serious and fatal crashes occur on them. Many of these dangerous streets extend through neighborhoods with high concentrations of communities of color and people with low incomes, where people are more likely to be walking, biking or using transit. As a result, these communities also bear a disproportionate amount of the region’s serious crashes.

While eliminating traffic related deaths and severe injuries can seem like a daunting goal, partners in the greater Portland region are taking action to address the issue head on.

Clackamas County has been a leader in setting aggressive safety targets. The county was the first local government in the state to develop a safety action plan. It uses the Toward Zero Deaths framework. The City of Portland has adopted a Vision Zero for 2025 and developed an ambitious Vision Zero Plan with an equity lens. In 2016, the City of Hillsboro adopted a safety action plan with a target of zero by 2035. Beaverton completed a Transportation Safety Action Plan in 2017 with a goal of zero fatalities and severe injuries by 2035. Washington County has completed a plan with a vision of moving towards zero deaths. In 2016, Oregon adopted its Transportation Safety Action Plan with a target of zero serious crashes by 2035.

4.7.6 Earthquake vulnerability, security and emergency management

In the next 50 years there is a significant risk that Oregon will experience a 9.0 Cascadia Subduction Zone earthquake and tsunami. As noted in the Oregon Resilience Plan, when a large earthquake is triggered within the Cascadia subduction zone, the result will be wide spread disruption of the transportation system. This disruption will make rescue and recovery operations in many areas difficult, if not impossible, and will have an immediate, disruptive impact on the economy. Thus the resilience of the transportation network is

²⁴ Distracted Driving: An Epidemic A Study of Distracted Driving Attitudes, Behaviors and Barriers Preventing Change, prepared for the Oregon Department of Transportation, Southern Oregon University, March 2016

considered a key factor for re-establishing other lifelines after a major Cascadia subduction zone earthquake.²⁵

The plan's Transportation Task Group assessed the seismic integrity of Oregon's transportation system, including bridges and highways, rail, airports, water ports and public transit systems, examined the special considerations pertaining to the Columbia and Willamette River navigation channels, and characterized the work deemed necessary to restore and maintain transportation lifelines after a Cascadia earthquake and tsunami. Recommendations in the plan for improving the resilience of transportation are based on the assumption that incremental improvements will be made over a 50-year timeframe. While these improvements are costly and spread out over a long time period, they must be initiated as a resilient transportation network is critical for re-establishing other lifelines, such as water, electricity, fuel, communication, and natural gas, after the earthquake. As noted in *One Oregon: A Vision for Oregon's Transportation System*, a \$92 billion economic loss can be avoided through a \$1.8 billion investment in seismic resiliency.²⁶

Terrorist events and natural disasters such as Super Storm Sandy provide good illustrations of the challenges facing metropolitan areas in preparing for and responding to unexpected security incidents or natural disasters. Effective coordination and communication among the many different operating agencies in a region and across the nation is absolutely essential.²⁷ Such coordination is needed to allow enforcement/security/safety responses to occur in an expeditious manner, while at the same time still permitting the transportation system to handle the potentially overwhelming public response to the security incident or natural disaster.

The Regional Disaster Preparedness Organization (RDPO) is a partnership of governmental agencies, non-governmental organizations and private sector stakeholders in the Portland metropolitan region collaborating to increase the region's resiliency to disasters. The RDPO formed in 2012 out of a desire to build upon and unify various regional preparedness efforts in the region including the Regional Emergency Management Group (REMG), the Urban Areas Security Initiative (UASI) Program and several discipline specific coordination groups. The mission of the RDPO is to build and maintain regional disaster preparedness capabilities through strategic and coordinated planning, training and exercising, and investment in technology and specialized equipment.

The RDPO-funded Oregon Department of Geology and Mineral Industries (DOGAMI) Enhanced Earthquake Impact Study (2017) assessed seismic vulnerability of bridges in

²⁵ The Oregon Resilience Plan, Reducing Risk and Improving Recovery for the Next Cascadia Earthquake and Tsunami, Oregon Seismic Safety Policy Advisory Committee, February 2013

²⁶ *One Oregon: A Vision for Oregon's Transportation System*, May 2016

²⁷ *The Role of the Metropolitan Planning Organization (MPO) In Preparing for Security Incidents and Transportation System Response*, Michael D. Meyer, Ph.D., P.E. Georgia Institute of Technology. Accessed November 10, 2007 at <http://www.planning.dot.gov/Documents/Securitypaper.htm>.

the region. The Sellwood Bridge and Tillikum Crossing Bridge have been built to be seismically resilient. In addition, planning work is under way for a seismic retrofit of the Burnside Bridge.

Figure 4.39 Seismic Vulnerability of the Bridges in the greater Portland region

Note: A map showing the seismic vulnerability of the region’s bridges will be added to the final RTP.

Figure 4.40 Designated Regional Emergency Transportation Routes (2006)



The RTP calls for updating the region’s emergency transportation routes (last updated in 2006) and implementing investments to increase system monitoring for operations, management and security of the regional mobility corridor system. These types of investments would enhance existing coordination and communication efforts in the region, and recognize these facilities would serve as the primary transportation network in the event of an evacuation of the region. The plan also directs Metro to work with local, state and regional agencies to identify critical infrastructure in the region, assess security vulnerabilities and develop coordinated emergency response and evacuation plans. Finally, transportation providers are directed to monitor the regional transportation and minimize security risks at airports, transit facilities, marine terminals and other critical infrastructure.

4.7.7 Gaps in transit, biking and walking connections

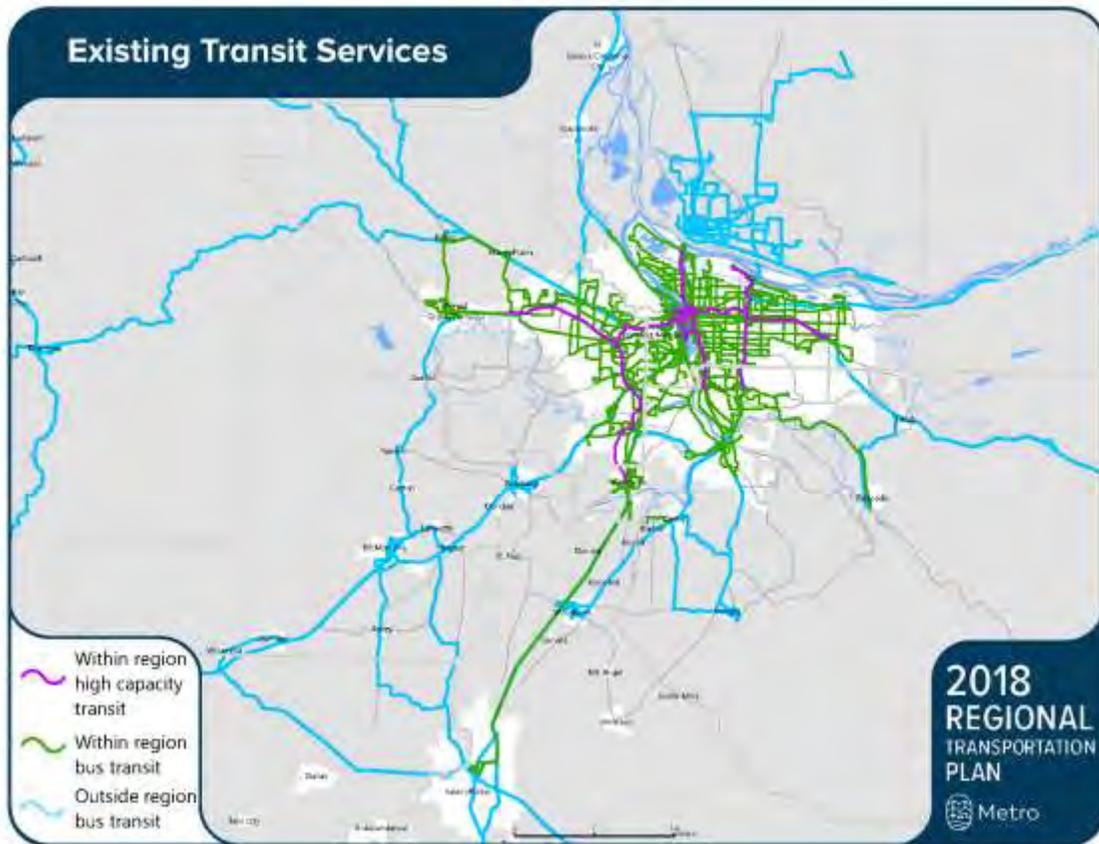
Increasing transit service is a key component of Metro’s Climate Smart Strategy for the Portland metropolitan region. The strategy identified making transit convenient, frequent, accessible and affordable as one of the most promising approaches to meet adopted targets for reducing greenhouse gas emissions from light-duty vehicles while creating healthy and equitable communities and a strong economy. To meet this goal new performance targets to increase the number of jobs and households, including low-income

households, within a ¼ mile of 15-minute service or better by 2035 were identified. In addition air quality-related federal laws require consistent service growth over time.

The transit system is especially important in ensuring mobility for people with low-income and people of color, who are twice as likely to be frequent transit riders as higher-income persons or white people. It is also critical to ensuring mobility for people who can't drive due to age or disability, or who simply choose not to own a personal vehicle. There are numerous ways to measure the busiest transit lines in the region, two options are the total number of passengers boarding and the productivity of the line – that is, the number of people boarding for every hour it operates.

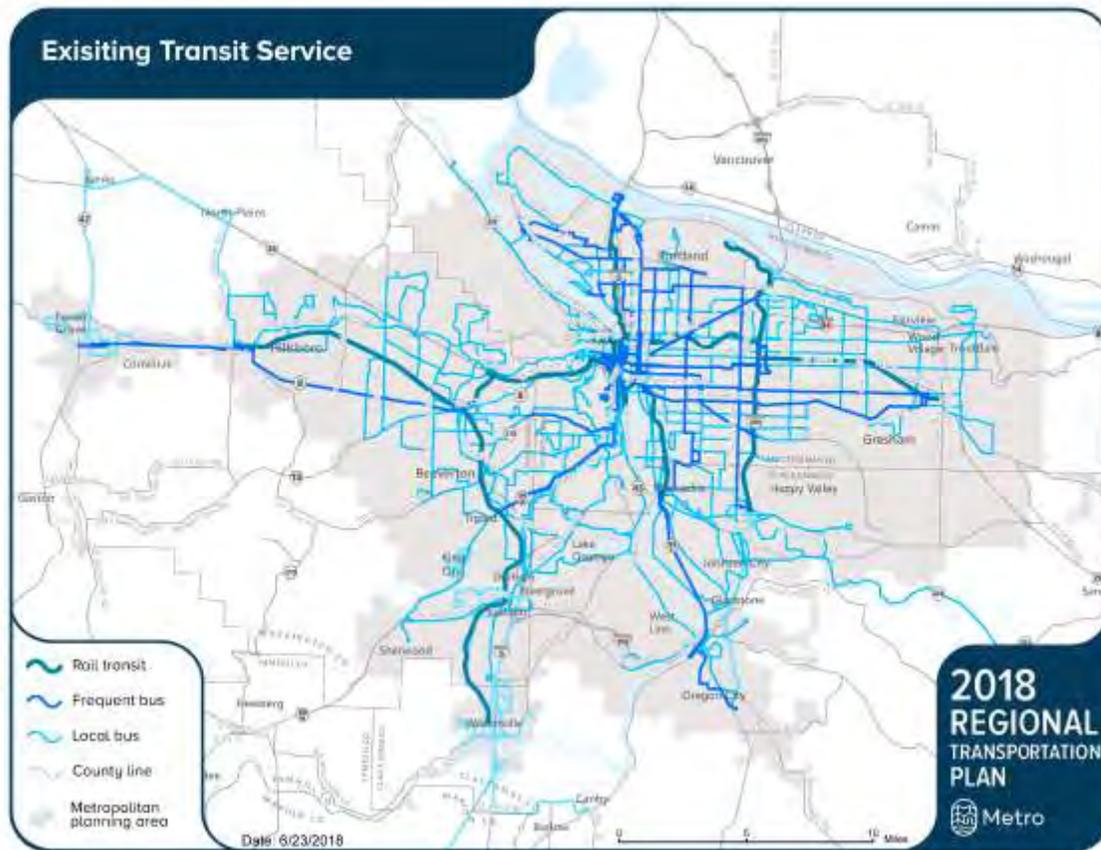
Figure 4.39 shows the existing transit system for the greater Portland region and beyond. Adding additional transit lines is part of the region's strategy to addressing the challenge of transit gaps.

Figure 4.41 Existing transit services in the greater Portland region and beyond



Increasing level of transit service can be just as critical to filling “transit gaps” as is adding new lines. **Figure 4.40** shows existing level of service on the transit system today.

Figure 4.42 Existing transit service, greater Portland region and beyond



Gaps in sidewalks, bikeways and regional trails are hindering the region’s ability to take full advantage of these affordable and healthy forms of transportation. Gaps in walking and bicycling facilities are impacting safety for the region’s most vulnerable roadway users and deterring people from using these modes of transportation and from accessing transit.

Figure 4.43 Percent of regional active transportation network complete

Planned regional pedestrian network (sidewalks at least one side of roadway)	60%
Planned regional bicycle network (on-street bikeways)	54%
Planned regional trail network (on the regional bike and pedestrian networks)	36%

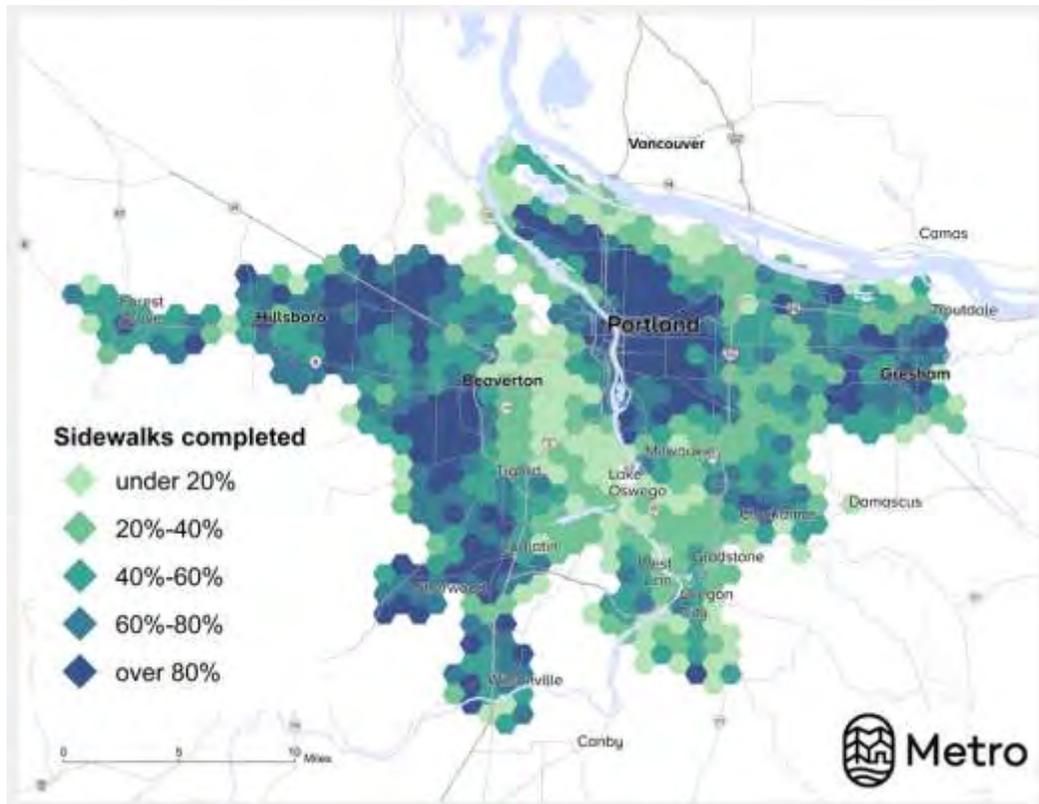
Approximately 60 percent of the planned regional pedestrian system has completed sidewalks on at least one side of the road.

Figure 4.44 Regional pedestrian existing system

Note: A map of existing regional pedestrian network gaps will be incorporated in the final RTP.

Significant portions of the region have pedestrian connections while other areas are lacking sidewalks, as seen in **Figures 4.42 and 4.43**.

Figure 4.45 Level of sidewalk completion in the greater Portland region, 2012



Approximately 54 percent of the planned regional bicycle network is complete. However, some existing facilities need to be improved to accommodate higher volumes of bicycle riders or to increase safety and level of comfort to attract more bicycle riders and prevent serious crashes. **Figure 4.44** shows the planned regional bicycle network, existing facilities and gaps that need to be filled.

Figure 4.46 Regional bicycle existing system

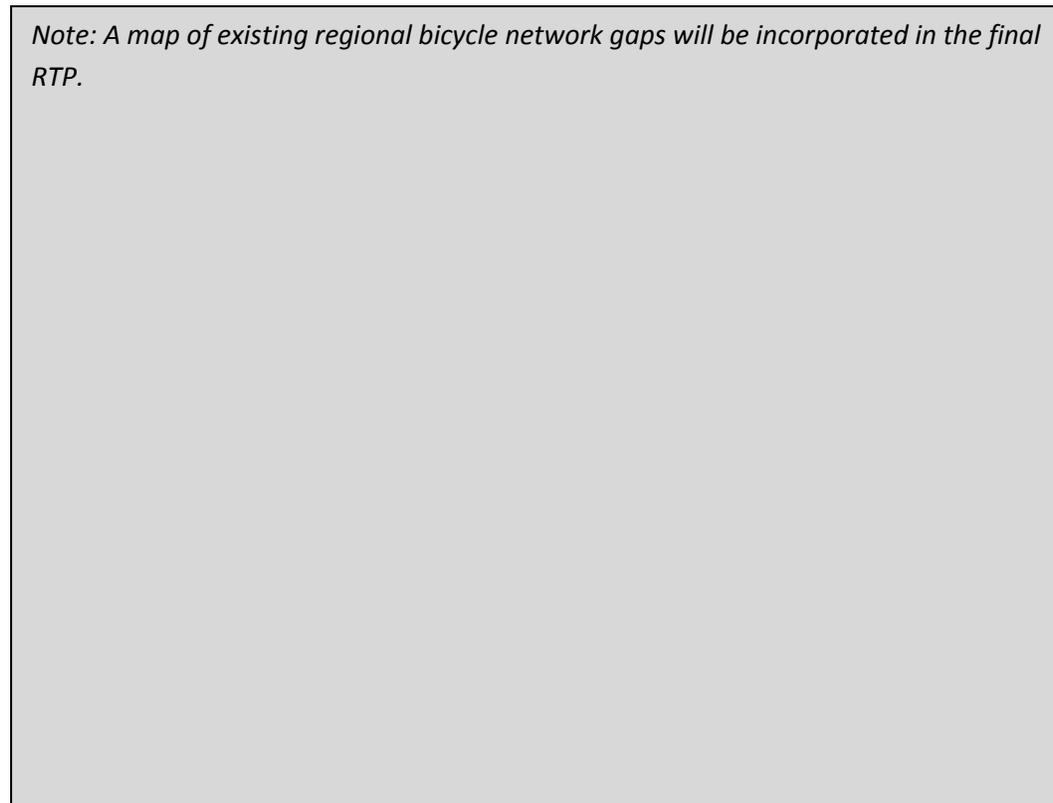
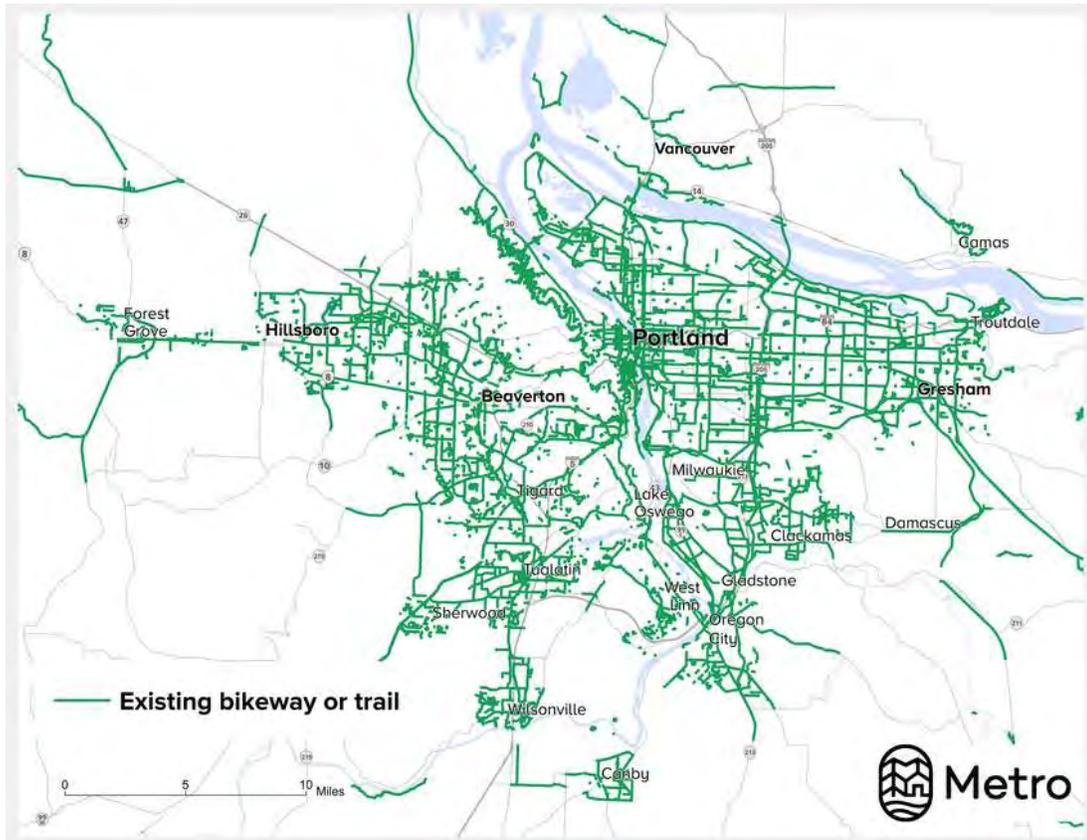


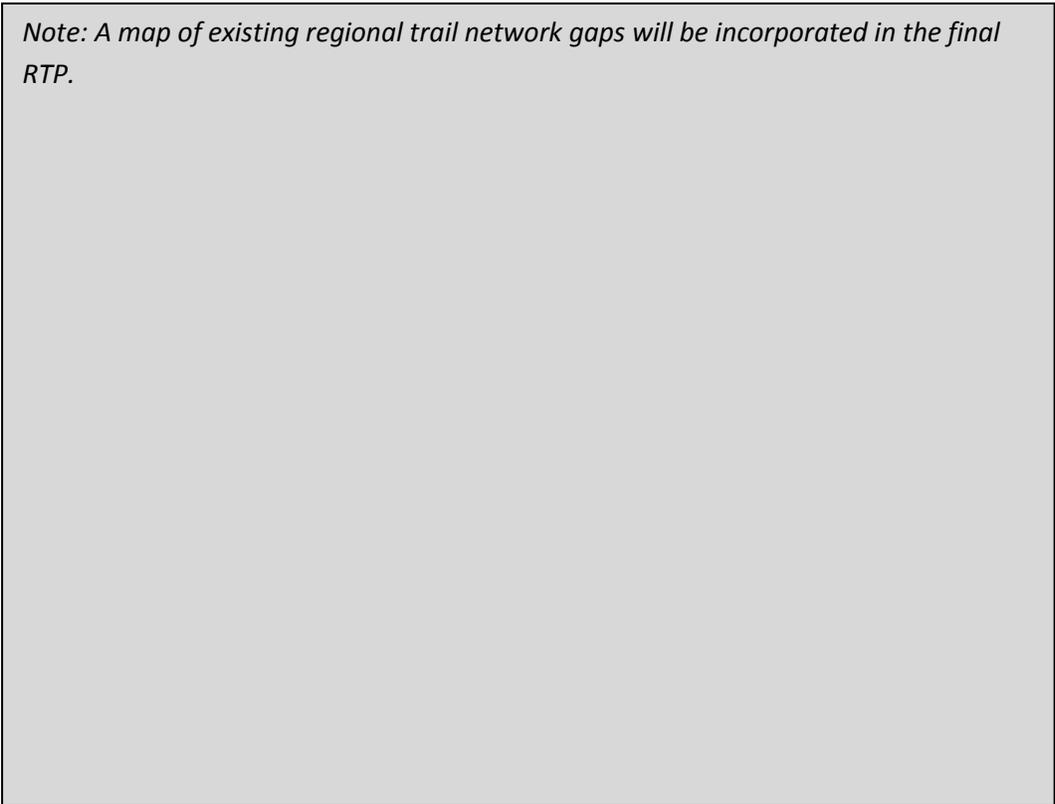
Figure 4.45 shows existing bicycle facilities in the greater Portland region in 2014. Currently, only 36 percent of all arterial roadways in the greater Portland region have bicycle facilities, and only 27 percent of all streets within 2040 centers have bicycle facilities. While demand for bicycling continues to grow the region is not taking full advantage of and supporting this affordable, reliable and healthy form of transportation.

Figure 4.47 Existing bikeways in the greater Portland region, 2014



Regional trails are a critical part of the active transportation network. Trails provide some of the most comfortable and safe facilities for walking and bicycling, especially when designed with Crime Prevention Through Environmental Design principles. Regional trails challenging to build and often require multiple partners and jurisdictions coordinating. Federal funding regulations can increase costs by up to 30 percent. Currently, approximately 36 percent of the planned regional trail network within the MPA boundary are complete.

Figure 4.48 Regional trail existing system gaps



4.7.8 Social inequity and disparities

The 2018 RTP offers opportunities to reduce barriers and disparities faced by communities of color and other historically marginalized communities.

Racial exclusion and bias leading to racial disparities

Oregon's history is rooted in racial bias, which has led to the greater Portland region having less racial diversity than other American cities. The history of Oregon's exclusionary laws dates back to 1848, when the Oregon Territory provisional government made it unlawful for Black people to live in the territory. The 1850 Donation Land Claim Act encouraged white settlers to move to the territory before any attempt was made to have the land ceded by the indigenous people – including the Multnomah, Clackamas, Tualatin and Chinook peoples of what would become the greater Portland region. In 1862, Oregon adopted a law requiring all African American, Chinese and Hawaiian people residing in Oregon to pay an additional annual tax. The Chinese Exclusion Act was passed in 1882 with the support of the state's full congressional delegation. Oregon's tensions around race continued to escalate and by the 1920s, Oregon had the nation's highest per capita membership in the Ku Klux Klan.

Through the 1940s, government policies prevented people of color from buying or renting homes outside of designated neighborhoods, while Japanese residents were relocated to internment camps during World War II. Through the 1960s and 70s – or later – real estate agents would discourage non-White clients from homes in White neighborhoods, and banks would often refuse loans for those properties when requested by a person of color. Meanwhile, banks would declare investments in homes in African American neighborhoods or other communities of color too risky and refuse loans for those properties.

Implicit and explicit practices of racial exclusion and bias extended to the development of the transportation system. People of color in Oregon had to pay additional surcharges on

Metro's strategic plan to advance racial equity, diversity and inclusion

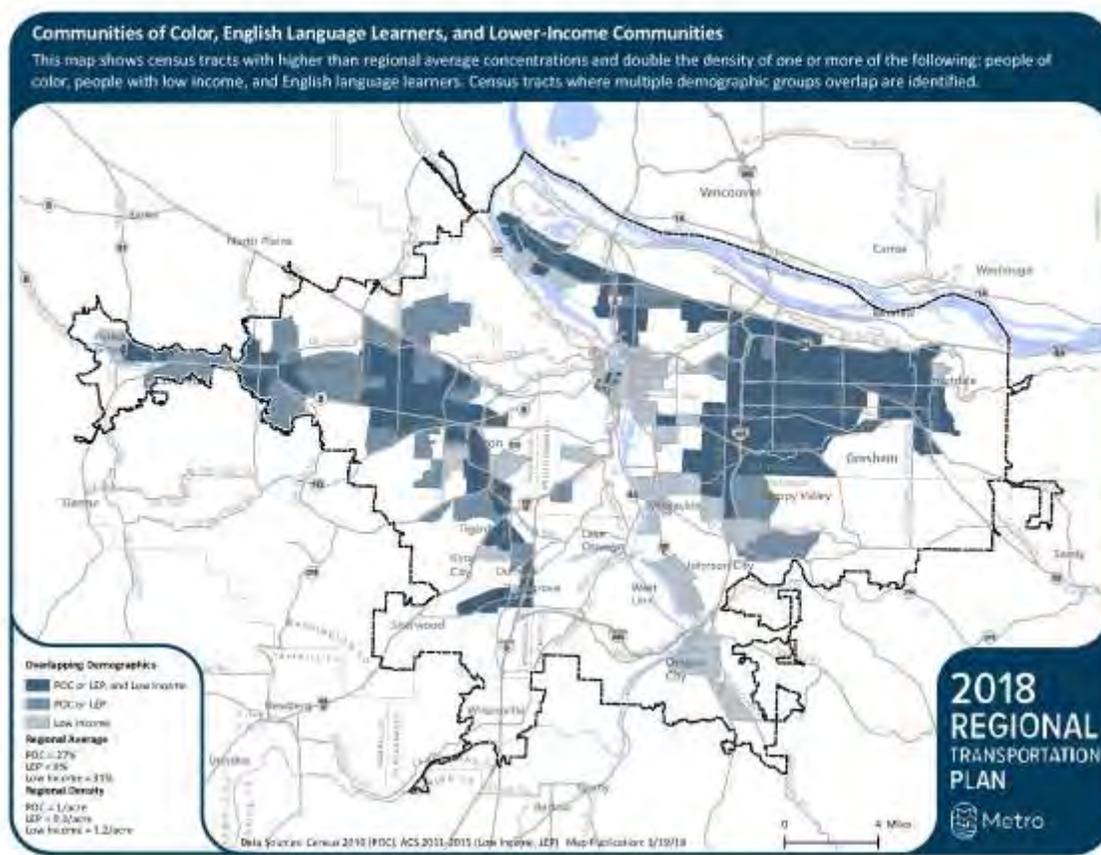
In June 2016 with the support of MPAC, the Metro Council adopted an equity plan that leads with race, committing to concentrate on eliminating the disparities that people of color experience, especially in those areas related to Metro's policies, programs, services and destinations. People of color share similar barriers with other historically marginalized groups such as people with lower income, people with disabilities, LGBTQ communities, women, older adults and young people. But people of color tend to experience those barriers more deeply due to the pervasive and systemic nature of racism.

By addressing the barriers experienced by people of color, we will also effectively identify solutions and remove barriers for other disadvantaged groups. The result of this racial equity focus will be that all people in the 24 cities and three counties of the greater Portland region will experience better outcomes.

car insurance up until 1951. When Interstate 5 opened in the 1960s, the new freeway cut a swath through Portland’s established African American neighborhoods, destroying at least 50 square blocks of homes and creating a barrier that still exists today.

Today, communities of color continue to point to issues of racial bias and inequity in enforcement of traffic laws and transit fares. Studies have also shown that drivers in the greater Portland region are significantly less likely to stop to allow an African American pedestrian to safely cross the street. Additionally, people of color are more likely to be victims of traffic fatalities and severe injuries.

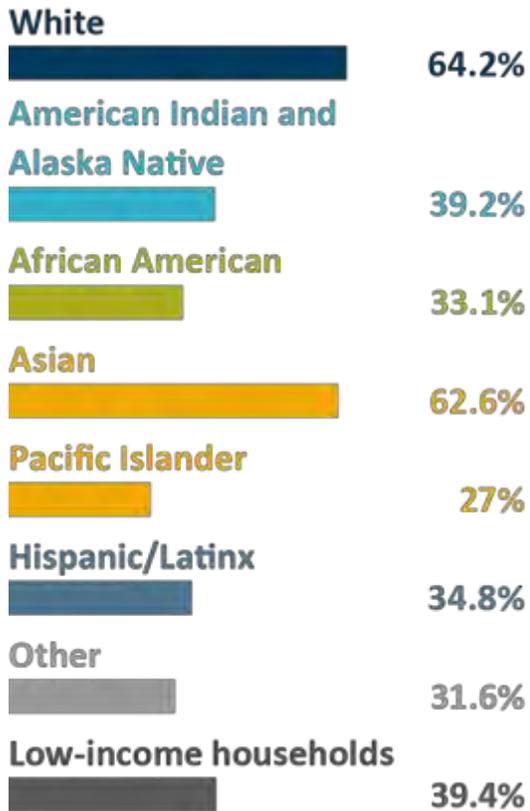
Figure 4.49 Map of communities of color, English language learners and lower-income communities in the greater Portland region, 2010



4.7.9 Housing and transportation affordability and displacement

Homeownership is cited as a key tool in both personal and family wealth development and community stabilization. Not only do people of color face issues of inequity in access to education and pay, the legacy of systemic racism in the region is reflected in current homeownership rates, which differ greatly by race.

Figure 4.50



As housing costs increase, families who own homes benefit from increased home value, while people who rent are forced to move farther from job centers and the community resources they rely on, increasing their daily travel cost and time.

Figure 4.51 Change in proximity to jobs within typical commute distance by race and ethnicity, 2002-2012 Portland-Vancouver MSA



Note: original source did not provide information for American Indians or Pacific Islanders

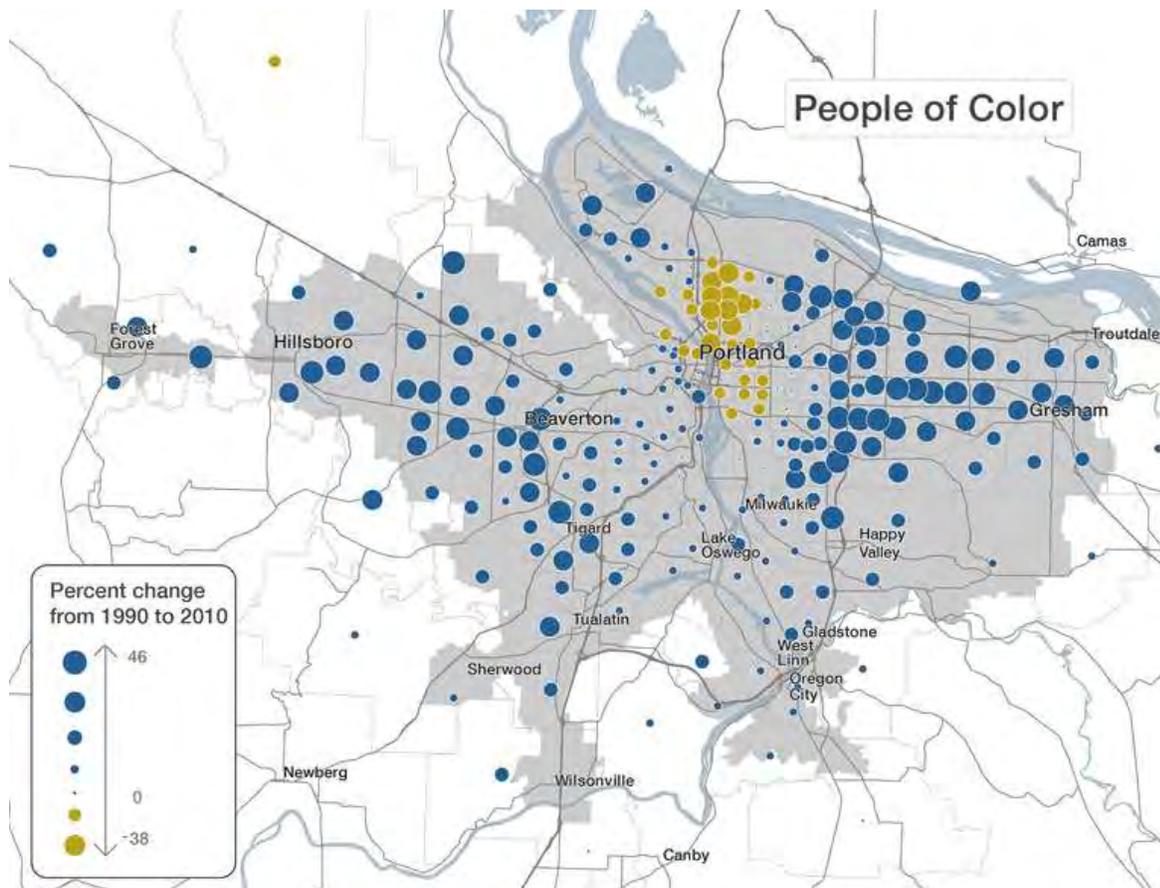
For example, a study by the Brookings Institute found that between 2000 through 2012, the number of jobs in a typical commute distance – for the greater Portland region that is 7.1 miles – fell by 1 percent, but for African Americans, Asians, and Latinx the number of jobs fell by 12 percent, 5 percent, and 3 percent during that 12-year period. Whereas for

White residents, the number of jobs within a typical commute distance did not change over the past 12 years – as shown in **Figure 4.49**.

Displacement affects communities as much as individuals

Displacement is often seen simply as a consequence of a growing population and an improving economy. Often unrecognized is a history that has concentrated communities of color into specific areas where they built strong community ties. Since these individuals and communities continue to face systemic inequities that limit access to the benefits of an improving economy, they are often priced out of these same areas as others gain stronger purchasing power. Not only does this displacement increase travel time and cost for individuals, it can create a cascading effect on the viability of community resources such as places of worship, community centers and culturally-focused businesses as members, users and customers lose convenient access.

Figure 4.52 Displacement for people of color in the greater Portland region, 1990-2010



4.7.10 Technological change

Technology is already transforming the greater Portland region's transportation system. In the City of Portland, ride-hailing services now carry more people than taxis do, providing over ten million rides within the city in 2017. Car share companies including Car2go, ReachNow and Zipcar operate over 1,000 vehicles in the greater Portland region. Some of these companies have been around for a decade, but new models have sprung up, including free-floating car share, which allows people to pick up and drop off a car anywhere within a defined area, and peer-to-peer car share, which makes it easy for neighbors to borrow cars from each other. The City of Portland's bike share system, Biketown, launched in July 2016 and carried over 300,000 trips in its first year, and there are signs that other bike share companies are looking to launch service here soon.

Meanwhile, smartphone apps have become the most popular way for people to get information on their travel choices, while the number of people who get information from other sources declined swiftly over the past three years. People increasingly rely on the real-time information that apps provide to make on-the-go decisions when congestion or a change in circumstances means that they can't take the mode or route that they normally do.

New services like car sharing and ride-hailing are bringing more affordable and efficient options to the region, but some of them may also be competing with transit and increasing congestion. We have new ways to meet the transportation needs of underserved people, but many of these new options are not accessible to all. Surveys conducted by Metro find that a disproportionately large number of frequent ride-hailing users are wealthy and young, while a disproportionately small number are low-income people or people over 45. The impacts are mixed and our information is limited, but it's clear that we're in an era of rapid change, and that public agencies need to act to make sure that emerging technology helps create more equitable and livable communities across the greater Portland region.

Many companies are already testing automated vehicles, and we will likely see these vehicles on the streets of our region within the next five years. Autonomous vehicles will likely accelerate the already-growing use of new mobility services when they arrive. New mobility companies are poised to be first to deploy shared autonomous vehicles, which could enable them to cut the cost of trips and serve new users.

These developments will deepen the impacts that technology is already having and affect how some of the most pressing issues facing our region play out. The greater Portland region has inequitable access to safe, reliable, healthy and affordable ways to get around and is experiencing rapid population growth, rising housing costs and increasing congestion. Emerging technology has the potential to help us confront these challenges – transportation equity, congestion, advancing the public interest - or to exacerbate them.

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2018 Regional Transportation Plan



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2018 Regional Transportation Plan

Chapter 5

Our Transportation Funding Outlook

June 29, 2018

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PURPOSE

Metro is the metropolitan planning organization (MPO) designated by Congress and the State of Oregon, for the Oregon portion of the Portland-Vancouver urbanized area, serving 1.5 million people living in the region's 24 cities and three counties. As the MPO, Metro formally updates the Regional Transportation Plan every five years in cooperation and coordination with the Oregon Department of Transportation and the region's cities, counties and transit agencies.

The Regional Transportation Plan is a blueprint to guide investments for all forms of travel – motor vehicle, transit, bicycle and walking – and the movement of goods and freight throughout the greater Portland region. The plan identifies current and future transportation needs, investments needed to meet those needs, and what funds the region expects to have available over the next 25 years to make those investments a reality.

As part of development of the RTP, federal regulations require the total cost of projects in the financially constrained list of projects to not exceed the total revenue reasonably expected to be available to the greater Portland region over the life of the plan. This includes information on how the Metro and our partnering agencies reasonably expect to fund the projects included in the plan, including anticipated revenues from the Federal Highway Administration and the Federal Transit Administration, state, regional or local sources, the private sector and user fees.

Chapter organization

This chapter demonstrates that the RTP is financially constrained, in compliance with federal law. It provides an overview of the long-range forecast for both revenues and costs. Details of the long-range forecasts, including key forecast assumptions, can be found in Appendix H. This chapter will be finalized pending review of the draft forecast and assumptions in Appendix H by federal partners.

This chapter is organized into the following sections:

- 5.1. Introduction:** This section describes the current outlook for transportation funding in the region and recent commitments by the Oregon Legislature to fund transportation throughout Oregon.
- 5.2. Sources of Revenue and Estimated Budget for Plan Investments:** This section summarizes forecasted revenue for transportation (capital and operations and maintenance), consistent with federal requirements, and the estimated budget for capital investments in the Regional Transportation Plan.



Learn more about the 2018 Regional Transportation Plan at oregonmetro.gov/rtp

5.1 INTRODUCTION

The 2018 Regional Transportation Plan will help make the case for more investment and funding to build, operate and maintain the regional transportation system we need for all modes of travel.

Our nation is investing less in building and maintaining our transportation system today than at any time in the post-war era. As federal funding for all types of transportation projects declines, the greater Portland region is falling behind in making the investments needed to support our growing population and our vision for a 21st century transportation system.



HB 2017 begins to address the gap in maintenance and transit service funding for our region, but there is still a significant gap in funding for capital investments.

Transportation funding for highways and mass transit has long been primarily a state and federal obligation, financed largely through gas taxes and other user fees such as a vehicle registration fee. The purchasing power of federal and state gas tax revenues is declining as individuals drive less and fuel efficiency increases. The effectiveness of this revenue source is further eroded because the gas tax is not indexed to inflation. These monies are largely dedicated to streets and highways – primarily maintenance and preservation – and, to a limited extent, building more roads.

Although Oregon’s HB 2001 Jobs and Transportation Act raised the state gas tax in 2011 by six cents, this revenue source had not increased since 1993. Similarly, the federal gas tax has not increased since 1993. This failure of the state legislature and Congress to keep pace with infrastructure needs has been particularly acute in Oregon, as other states have responded with increases in local and regional sales tax measures to cope with the decrease in purchasing power of federal transportation funding. Lacking a sales tax or other tools, the greater Portland region has focused on bonding strategies based on future revenue and, therefore, has not developed a long-term strategy to fund our transportation system.

We need to complete gaps in our region’s transit, walking and biking networks to help expand affordable travel options, yet active transportation currently lacks a dedicated funding source. The transit system has relied heavily on payroll taxes for operations and competitive federal funding for high capacity transit. But the region’s demand for frequent and reliable transit service exceeds the capacity of local payroll tax to support it.

Because federal and state funding has not kept pace with infrastructure operation and maintenance needs, a substantial share of funding for future regional transportation investments has shifted to local revenue sources. Local governments in the region (like others in Oregon) have turned to increased tax levies, road maintenance fees, system

development charges and traffic impact fees in attempt to keep pace, although some communities have been more successful than others. Other regions have responded by increasing local investment through local and regional tax measures.

A change in the funding outlook – but more is needed

In recent years, the Oregon Legislature has begun to once again make significant commitments to investment in transportation across all of Oregon’s communities. HB 2017, Keep Oregon Moving, increases the gas tax and vehicle title and registration fees over a seven-year period. The motor fuels tax (30 cents per gallon in 2017) increased by 4 cents in January 2018. It will also increase 2 cents in 2020, 2022 and 2024, subject to ODOT meeting accountability and reporting requirements.



The annual registration fees and title fees will be tiered based on vehicle fuel efficiency in order to ensure that more efficient vehicles that pay little gas tax contribute their fair share for use of the roads. In addition, the weight-mile tax on heavy trucks will increase to ensure that trucks pay their fair share for their wear and tear on the roads. All of these funds are constitutionally dedicated to the State Highway Fund and can only be used for roads. In addition, Keep Oregon Moving creates three new taxes.

About half of the additional State Highway Fund provided by Keep Oregon Moving will go to local governments, who will receive a 50 percent increase in the amount they get from the State Highway Fund for local road and street maintenance and improvements. Keep Oregon Moving also included a new Safe Routes to School program to provide better ways for children to bike and walk safely to school; this program is funded statewide at \$10 million per year initially and grows to \$15 million per year and will complement Metro’s Regional Safe Routes to School program.

The Legislature also specified a number of projects that will be built around the state, but the majority of the funding coming to ODOT will go to fix bridges and roads, making them safer and resilient to a major earthquake. Several projects are located in the greater Portland region, including the I-5 Rose Quarter Improvement project and adding new auxiliary lanes on OR 217 and I-205 within the city of Portland.

Despite the significance of HB 2017 to Oregon and the greater Portland region, resources remain limited to build the system we need to support our growing economy, labor force and communities. Diminished resources mean reduced ability to improve, enhance and expand infrastructure for a safe, reliable, healthy and affordable system. More funding will be needed to address the region’s transportation challenges and build a 21st century transportation system as envisioned in community and regional plans.

5.2 Sources of Revenue and Estimated Budget for Plan Investments

A constrained revenue forecast that meets federal requirements for demonstrating reasonable availability of expected future funding is summarized in **Table 5.1**.

Table 5.1 RTP Constrained Revenue Forecast Summary for 2018-2040 (2016\$)

RTP Constrained Revenue Forecast Summary for 2018 to 2040 (2016\$)		
Revenue Category	Constrained Revenues	Notes
Federal (FHWA based – non transit)	\$1,290,865,000	By individual fund type code
Federal (FTA based – transit)	\$4,010,744,000	By individual fund code with some grouping due to formula allocations
State Revenues to Transit Needs	\$514,617,000	State generate revenues committed to transit purposes (by fund type code or funding program code)
State Revenues (HB 2017 – non-transit)	\$701,627,000	Identified by HB 2017 allocation categories in support of capital needs)
ODOT Combined Revenues (capital/enhance/modernization areas)	\$993,374,000	Combined federal & State for capital/modernization needs. Estimated at the Region 1 level and within the MPO boundary area
ODOT Fix-It (OM&P) Combined Program Revenues	\$1,635,898,000	Combined state and federal revenues estimated for ODOT Region 1
Subtotal Federal and State Revenues:	\$9,197,286,000	Subtotal from all above categories
Local Revenues (counties and cities)	\$15,530,628,000	Three counties and cities (all local revenue programs combined)
Local Revenues (Transit)	\$19,005,351,000	TriMet and SMART
Total All Revenues (capital and operations, maintenance and preservation)	\$43,733,264,000	

In 2016 dollars and rounded to the nearest \$1,000.

As shown in the previous table, the \$43.7 billion in estimated total revenues for the greater Portland region do not represent the actual available revenues for regional system capital improvements. The three counties, cities, TriMet, SMART, ODOT all have to address

operations and maintenance (O&M) needs which reduces to amount of revenue available to address capital needs.

The region’s operations and maintenance commitment is significant and consumes approximately 51 percent of the total federal, state, and local revenues identified for the greater Portland region. After accounting for the estimated O&M commitment, the constrained revenue forecast is estimated to have \$22 billion available for capital improvements. *Note: This estimate is preliminary and subject to further review in consultation with federal partners.*

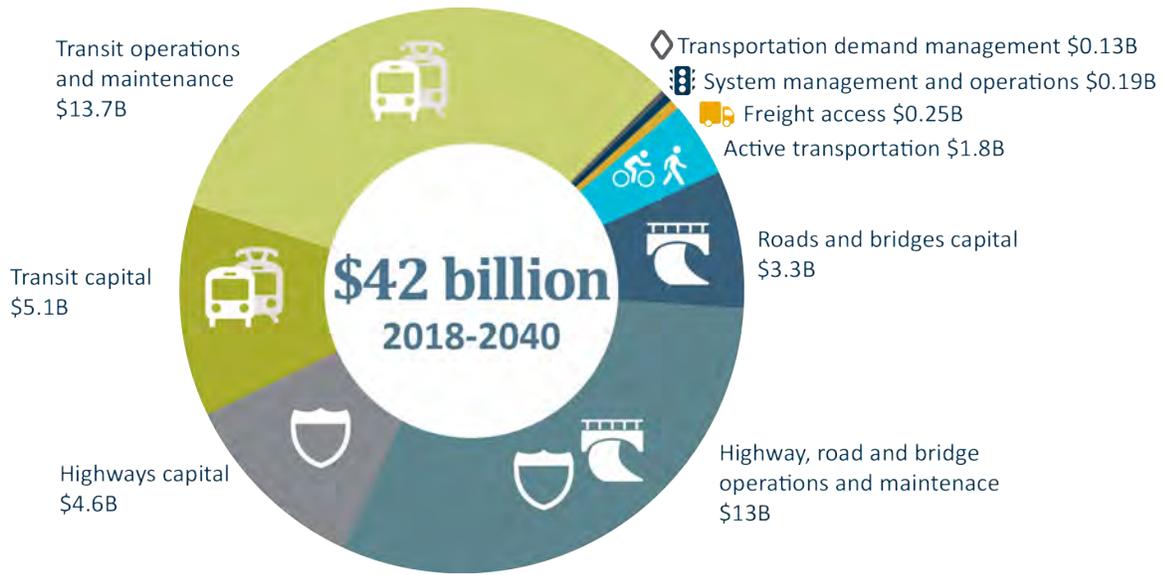
Table 5.2 RTP Constrained Revenue Forecast Estimates Summary for Capital Investments for 2018-2040 (2016\$)

RTP Constrained Revenue Forecast Estimates Summary for Capital Investments for 2018 to 2040		
Revenue Category	Constrained Revenues	Notes
Federal and State Revenues	\$9,197,286,000	By individual fund type code
Local Revenues (Estimated available for capital needs)	\$4,971,217,000	3 counties and cities together
Local Revenues for Transit (Estimated available for capital needs)	\$7,939,218,000	TriMet and SMART
Total Constrained Revenues for Capital Projects in the RTP for 2018-2040	\$22,107,721,000	Limits local funds to available funds for capital needs identified by agencies

In 2016 dollars and rounded to the nearest \$1,000.

More detailed information about the forecasting assumptions, sources of funding accounted for and process used to develop the draft forecast can be found in Appendi H. Proposed investments in the regional transportation system are summarized in more detail in Chapter 6. **Figure 5.1** shows the total estimated cost of investments in the financially constrained RTP, including maintenance and operations of the transportation system. *Note: This estimate is preliminary and subject to further review in consultation with federal partners.*

Figure 5.3 Total estimated investment by 2040 (2016\$)



Note: This chapter will be finalized pending review of the draft forecast and related financial assumptions in Appendix H in consultation with federal partners during the public comment period.

2018 Regional Transportation Plan



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2018 Regional Transportation Plan

Chapter 6

Regional Programs and Projects to Achieve Our Vision

June 29, 2018

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6.1 INTRODUCTION

Implementing projects and programs of the 2018 Regional Transportation Plan (RTP) will help achieve the desired outcomes for a great region. Six desired outcomes for the region have been endorsed by the Metro Policy Advisory Committee (MPAC) and approved by the Metro Council. The 2018 Regional Transportation Plan seeks to help achieve the desired outcomes:

- Vibrant communities
- Economic prosperity
- Safe and reliable transportation
- Leadership on climate change
- Clean air and water
- Equity



Six Desired Outcomes
for Greater Portland

6.1.1 Addressing our most urgent needs through our investments

We know the transportation funding landscape is changing, and building a safe, reliable and sustainable transportation system requires steady, long-term investment. But, we don't have the resources to invest at the levels needed to address all of the challenges the region faces and achieve our shared vision and goals for the transportation system. Prioritizing where and how to invest limited transportation funding is a key part of developing and implementing the RTP.

Prioritizing starts with understanding the challenges we need to address. Regional transportation challenges were identified through the engagement process during the update of the RTP. The regional investment strategy was developed to address these challenges and achieve the investment priorities discussed in the next section. Each of the challenges listed below are described in Chapter 4.

- Aging infrastructure
- Climate change and air quality
- Congestion and reliability
- Fatal and life-changing crashes
- Earthquake vulnerability, security and emergency management
- Gaps in transit, biking and walking connections
- Social inequity and disparities

- Housing and transportation affordability and displacement
- Technological change

6.1.2 Chapter organization

This chapter describes how the region plans to invest in the transportation system across all modes, with expected funding, to provide a safe, reliable, healthy and affordable transportation system with travel options.

6.1 Introduction: This section introduces the chapter, including challenges the region is facing that the project lists address.

6.2 What Are the Region's Investment Priorities? This section describes the investment priorities identified through the updated of the RTP. The project lists were developed in response to the identified investment priorities.

6.3 2018 RTP Projects and Programs: This section describes the 2040 Constrained project list, which are the projects and programs that fit within the constrained budget of federal, state and local funds the greater Portland region can reasonably expect through 2040 under current funding trends. The section describes how the project list was developed, and the types and cost of projects (investment categories) that are in the 2040 Constrained list.

6.4 The 2040 Strategic Project List: This section describes the 2040 Strategic list of projects and programs, which reflect the full list of projects needed to meet the region's transportation needs, but for which funding has not been identified.

6.2 WHAT ARE THE REGION'S INVESTMENT PRIORITIES?

The Regional Transportation Plan (RTP) responds to the 2040 Growth Concept through an approach that views the transportation system as an integrated and interconnected system, shifting the emphasis from simply moving vehicles to moving people and goods, providing access, and helping to create and connect places. The six desired outcomes adopted are supported by goals of the RTP and become the focal point for identifying investment priorities.

During the update of the RTP, regional investment priorities were identified to address the challenges listed in the section above. These regional transportation investment priorities are described below, and guided the development and refinement of the 2018 RTP projects and programs.

Major trends and shifts

Technological change, housing and transportation affordability and displacement, changing demographics and an aging population, and social inequities and disparities are major societal trends and shifts which impact and are impacted by investments in the regional transportation system.

Policies, projects and programs of the RTP seek to inform these major shifts and trends in order to achieve the region's six desired outcomes, while acknowledging that many forces and influences are at play and there are more unknowns than knowns.

6.2.1 Maintaining the system we have

The RTP is an important tool to helping to maintain the existing transportation system. The RTP recognizes the importance of prioritizing maintaining the system we have before building new roadways.

Maintenance of the transportation system is the largest transportation cost and it is growing. Maintaining and updating aging infrastructure, retrofitting to address earthquake vulnerability, and providing for security and routes for efficient emergency services are growing concerns across the region.

6.2.2 Implementing the 2040 Growth Concept

Implementing the 2040 Growth Concept is one of the main roles of the RTP. The RTP recognizes the importance of prioritizing transportation investments in the 2040 growth areas to support the region's economic vitality and commercial activity. These are the areas where the greatest growth is planned for, and where the most trips will be occurring.

- City center, regional centers and town centers
- Station communities
- Main streets
- Corridors
- Industrial and employment areas

Transportation investments also play an important role in placemaking, which helps achieve the 2040 Growth Concept vision for a strong economy, a healthy environment and

communities that serve the needs of all. Refer to Chapter 1 for more information on the 2040 Growth Concept.

6.2.3 Implementing the Climate Smart Strategy

The 2018 Regional Transportation Plan is a key tool for implementing the adopted Climate Smart Strategy and achieving a new 2040 target adopted by the Land Conservation and Development Commission in 2017. The RTP recognizes the importance of prioritizing transportation investments that help reduce greenhouse gas emissions from cars and small trucks while making our transportation system safe, reliable, healthy and affordable.

6.2.4 Focusing on transportation equity

The RTP is a key tool for implementing Metro’s adopted Strategic Plan to Advance Racial Equity, Diversity and Inclusion. The RTP recognizes the importance of prioritizing transportation investments that will reduce barriers and disparities faced by communities of color and other historically marginalized communities, while making our transportation system safe, reliable, healthy and affordable.

6.2.5 Implementing Vision Zero

The RTP is a key tool for implementing the adopted Regional Transportation Safety Strategy and achieving a new Vision Zero target to eliminate traffic deaths and life changing injuries by 2035. The RTP recognizes the importance of prioritizing transportation investments that will move the region as quickly as possible towards Vision Zero, especially in communities of color and other historically marginalized communities that experience disparate impacts from traffic crashes.

6.2.6 Managing congestion to improve reliability

The RTP is a key tool to addressing congestion by improving reliability. The RTP recognizes the importance of prioritizing strategic transportation investments that will make travel more reliable on the region’s busiest roadways and regional bus routes. While the RTP acknowledges that congestion cannot be eliminated, there are projects and tools that can make travel times reliable. Refer to Chapter 4 for more information on congestion and regional highway bottlenecks.

6.2.7 Expanding travel options

The RTP is a key tool to expanding travel options. Completing gaps in the walking and bicycling networks, increasing safe access to transit, and supporting travel decisions with community, neighborhood, and employment outreach programs are a top priority of the RTP. These types of investments are foundational to achieving other desired outcomes such as safety and reduced vehicle miles traveled per capita.

6.3 2018 RTP PROJECTS AND PROGRAMS

The Regional Transportation Plan (RTP) comprises two main parts: the policy sections and the project lists. The policy sections, in Chapters 2 and 3, set the vision, goals, objectives, performance targets and policies for the greater Portland region's system of throughways, arterials, bridges, bikeways, sidewalks, and transit and freight routes.

The project lists, described in this Chapter and provided in Appendices A, B and C, are priority projects from local, regional or state planning efforts that provided opportunities for public input.

6.3.1 Developing the project lists

To develop the RTP lists of projects and programs, Metro issued a call for projects to its regional partners to begin updating the region's transportation investment priorities into three separate funding scenarios.



2018–2027

The 2027 Constrained funding scenario identifies the highest priority projects and programs that the greater Portland region anticipates funding in the first 10-years of the plan.



2018–2040

The 2040 Constrained funding scenario includes all of the projects and programs that fit within a constrained budget of federal, state and local funds the greater Portland region can reasonably expect through 2040 under current funding trends. In order to be eligible for federal or state transportation funding, a project must be included on the 2040 Constrained list.



2018–2040

The 2040 Strategic includes additional strategic priority investments (not constrained to the budget based on current funding trends) that could be built with additional resources. This is referred to as the 2040 Strategic and are not anticipated to be completed unless new, as of yet identified funding becomes available.

Working with a constrained budget and funding targets, Clackamas, Multnomah and Washington counties and cities within each county recommended priority projects for their jurisdictions at county coordinating committees; the Oregon Department of Transportation (ODOT), the Port of Portland, TriMet, SMART and other agencies worked with county coordinating committees and the City of Portland to recommend priority

Did you know?



Since the last update of the RTP in 2014, of the 1,256 projects listed in the RTP, 132 have been built or will be completed by 2019 – a total of \$3.15 billion invested in the regional transportation system

projects; and the City of Portland recommended projects after reviewing priorities with its community advisory committees. These projects were provided to Metro to build the draft project lists for initial public review and technical evaluation in winter 2018.

For the first time, Metro and regional partners refined the draft project lists based on a system performance and transportation equity evaluation of the draft project lists, initial public input and regional priorities identified through the fourth, and final, regional leadership forum. Based on the system performance results and priorities affirmed by city, county and regional policymakers and business and community leaders from across the greater Portland area, Metro provided a set of recommendations to regional partners to guide finalizing the RTP project lists for public review and technical evaluation.

Table 6.1 summarizes the seven overall recommendations from the system performance evaluation results and priorities from policymakers and leaders in the region, and illustrates how the draft projects lists for each funding scenario was refined to address the recommendations. Refer to Appendix E for additional information on what changed.

Table 6.1 Seven key recommendations and refinement of RTP projects lists

<p>Make more near-term progress on key regional priorities – equity, safety, travel options, Climate Smart Strategy implementation and congestion. Advance projects that address these outcomes to the 10-year list to make travel safer, ease congestion, improve access to jobs and community places, attract jobs and businesses to the region, save households and businesses time and money, and reduce vehicle emissions.</p>	
<p>Make more near-term progress to reduce disparities and barriers that exist for historically marginalized communities. Advance projects that improve safety and expand travel options to the 10-year list to reduce disparities and barriers, especially for people of color and households of modest means.</p>	
<p>Prioritize projects that focus on safety in high injury corridors. Advance projects in high injury corridors to the 10-year list and ensure all projects in high injury corridors address safety to reduce the likelihood and severity of crashes for all modes.</p>	
<p>Accelerate transit service expansion. Increase transit service as much as possible beyond Climate Smart Strategy investment levels. Focus new and enhanced transit service to connect transit to underserved communities to jobs and community places, in congested corridors and in areas with more jobs and housing.</p>	
<p>Make more near-term progress to tackle congestion and manage travel demand. Advance lower cost projects to the 10-year list that use designs, travel information, technologies, and other strategies to support and expand travel options and maximize use of the existing system. It will be important to ensure that lower income households are not financially burdened by strategies to make road use more efficient.</p>	
<p>Prioritize completion of biking and walking network gaps in the near-term. Advance projects that fill gaps for biking and walking in high injury corridors or that provide connections to transit, schools, jobs and 2040 centers to the 10-year list.</p>	
<p>Continue to build public trust through inclusive engagement, transparency and accountability. Continue to engage the region’s diverse communities in the planning and implementation of projects to achieve desired outcomes, including equity, safety, reliability affordability and health. Report back whether projects deliver (or don’t deliver) anticipated outcomes and adjust course as needed.</p>	

6.3.2 RTP 2040 Constrained projects and programs

Once the final RTP project lists were developed, Metro conducted a final system performance evaluation and assessment of the project lists. Results from the system performance evaluation are provided in Chapter 7. This section describes the projects and programs from the 2040 Constrained list of projects. This is the list that the region can reasonably assume it will fund and complete based on funding assumptions. Projects and programs identified in the 2040 Strategic list are not described in this section because funding has not been identified. The 2040 Strategic list of projects is described in **Section 6.4**.

Table 6.2 shows the breakdown of RTP projects in the constrained lists by investment category, and provides a quick reference for comparing the relative cost of the 2027 Constrained (the 10-year plan) and full 2040 Constrained investment strategies. For comparison and context, information is provided from the adopted Climate Smart Strategy to help decision-makers understand how much of the region’s commitment will be implemented. The strategic investment scenario is not included because funding has not been identified for projects on that list. Refer to **Section 6.4** for costs associated with the strategic list.

Table 6.2 Estimated costs for investment strategies (2016\$)

RTP Capital Costs	Climate Smart Strategy 2010-2035	 2018–2027	 2018–2040
Transit capital	\$4.7 billion	\$3.2 billion	\$5.1 billion
Throughways capital	\$4.1 billion	\$1.1 billion	\$4.6 billion
Roads and bridges capital	\$5.2 billion	\$1.5 billion	\$3.3 billion
Freight access	<i>Not evaluated</i>	\$156 million	\$248 million
Active transportation	\$2.2 billion	\$770 million	\$1.8 billion
Technology – system management	\$219 million	\$71 million	\$189 million
Information – travel options	\$197 million	\$51 million	\$127 million
RTP Operations and Maintenance Costs	Climate Smart Strategy 2010-2035	 2018–2027	 2018–2040
Transit operations and maintenance	\$8.5 billion	\$5.7 billion	\$13.7 billion
Roads and throughways operations and maintenance	\$12.8 billion	\$6 billion	\$13 billion
Total estimated costs (2016\$)	\$38 billion	\$18.5 billion	\$42 billion

Why the constrained project list matters

In order to be eligible for federal or state transportation funding, a project must be included on the “constrained” list and must be part of the planned regional transportation system.

The region’s operations and maintenance commitment is significant and consumes the majority of federal, state, and local revenues identified for the greater Portland region through 2040 – an estimated \$26.7 billion. The draft constrained list of capital projects represents another \$15.4 billion in capital investment in the region’s transportation system. A well-maintained, complete and efficient transportation system must meet multiple needs and offer options for people, goods and services to get around.

Figure 6.1 shows the total estimated cost of the draft constrained list of capital projects and estimated operations and maintenance of the transportation system by investment category for the period 2018-2040.

Defining terms

Constrained budget

The budget of federal, state and local funds the greater Portland region can reasonably expect through 2040 under current funding trends – presumes some increased funding compared to current levels

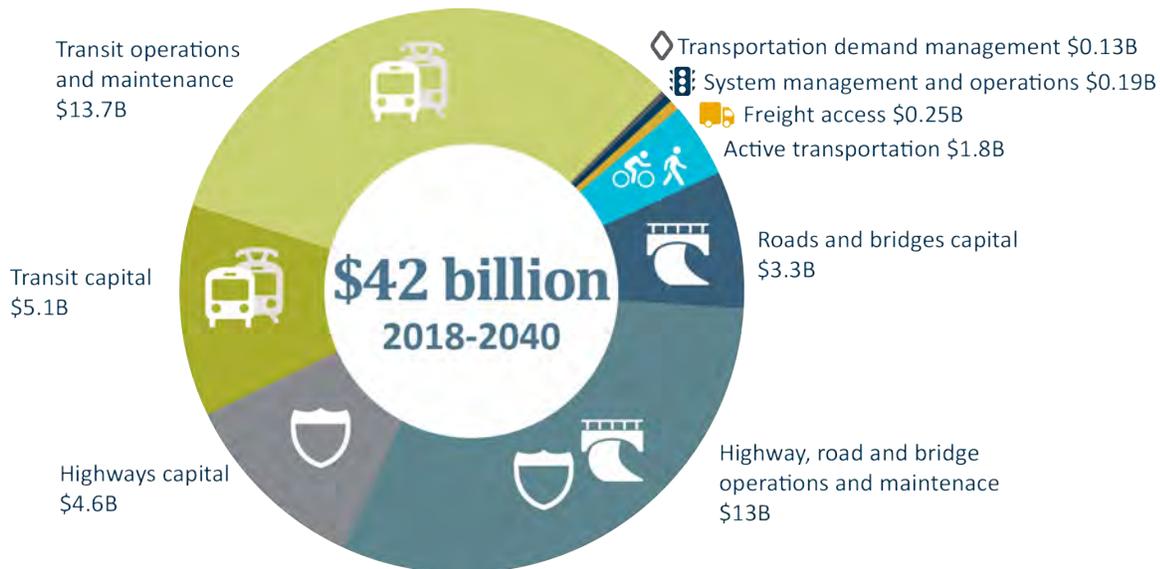
Constrained list

Projects that can be built by 2040 within the constrained budget – makes up the federal constrained transportation plan

Strategic list

Additional priority projects that could be achieved with additional resources

Figure 6.1 Total estimated investment by 2040 (2016\$)



The figures below show the breakdown of capital projects by cost and number for each investment category, for the region, for each of the counties and for the City of Portland.

Figure 6.2 Greater Portland region 2040 Constrained RTP: Cost and number of projects by investment category

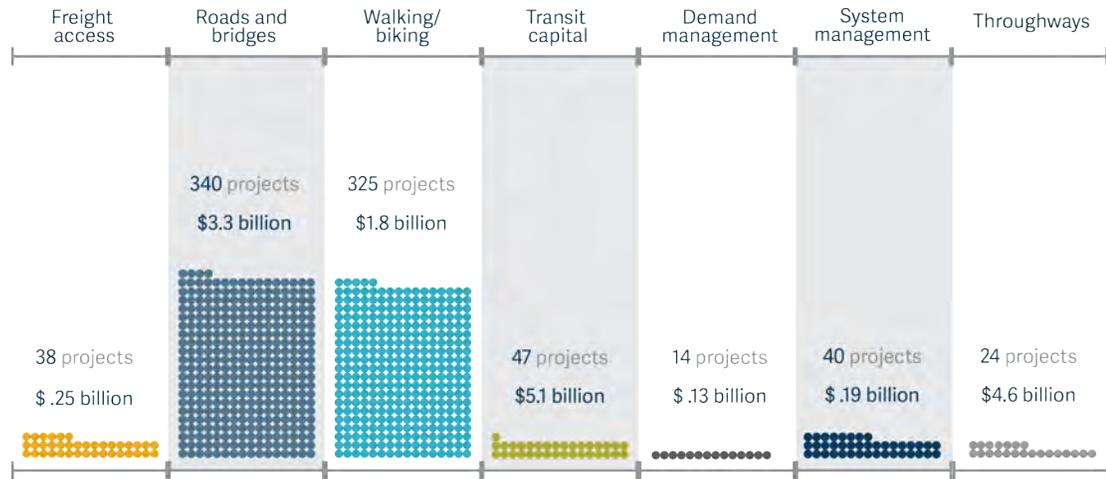
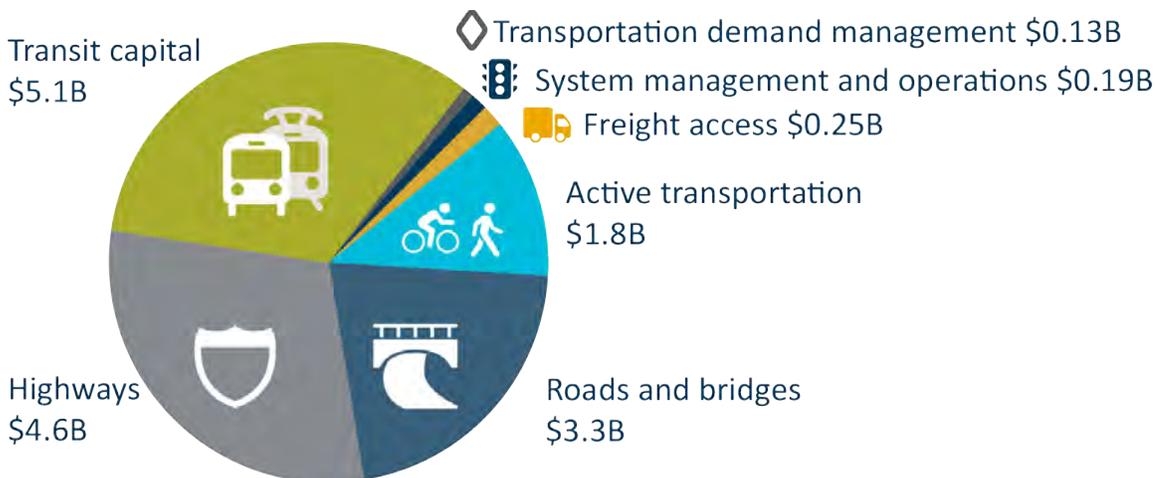


Figure 6.3 shows RTP investments broken down by investment category and percent of total cost. Roads, bridges, and walking and biking connections have the most projects in the draft 2018 Regional Transportation Plan constrained list, though the cost of projects vary greatly as shown in **Figure 6.4** Projects in the draft 2018 Regional Transportation Plan constrained list range from \$1 million to nearly \$3 billion.

Figure 6.3 Greater Portland region 2040 Constrained RTP: Cost of capital projects by investment category



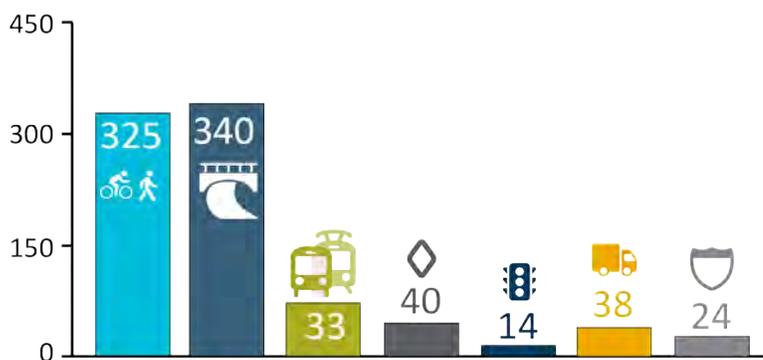
Note: Road and transit operations and maintenance costs are not included in the project list or information presented here.

Figure 6.4 Greater Portland region 2040 Constrained RTP: Cost range of projects by investment category



Roads, bridges, and walking and biking connections have the most projects in the 2040 Constrained list, though the cost of projects vary greatly.

Figure 6.5 Greater Portland region 2040 Constrained RTP: Number of capital projects by investment category



Similar to the region as a whole the City of Portland projects includes a relatively small number of transit capital and highway projects that together comprise the majority of costs in their list. In the City of Portland, active transportation projects comprise a majority of the projects, but are relatively low cost. See figures below.

Figure 6.6 City of Portland 2040 Constrained RTP: Cost of capital projects by investment category

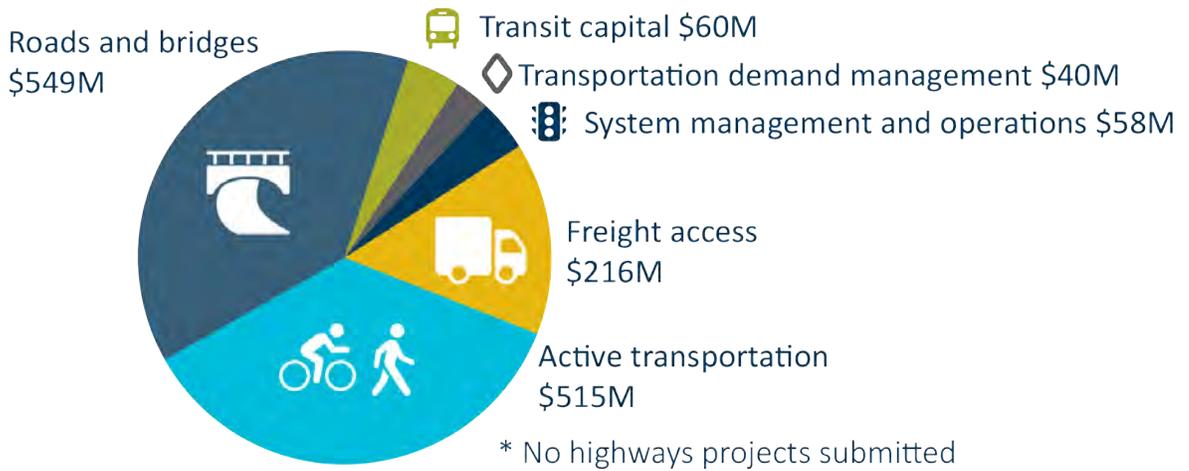
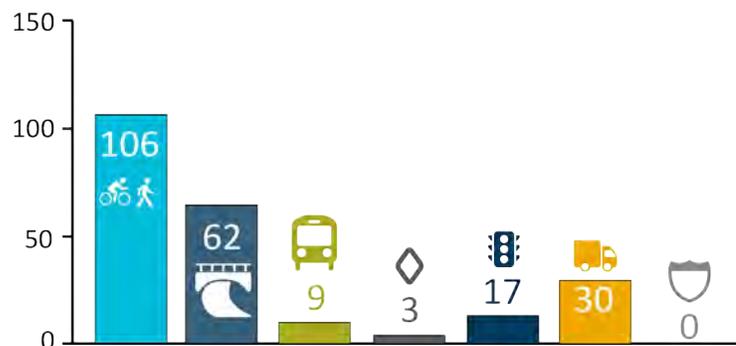


Figure 6.7 City of Portland 2040 Constrained RTP: Number of capital projects by investment category



Unlike the region as a whole, in Clackamas County active transportation projects comprise a majority of costs and number of projects. See figures below.

Figure 6.8 Clackamas County 2040 Constrained RTP: Cost of capital projects by investment category

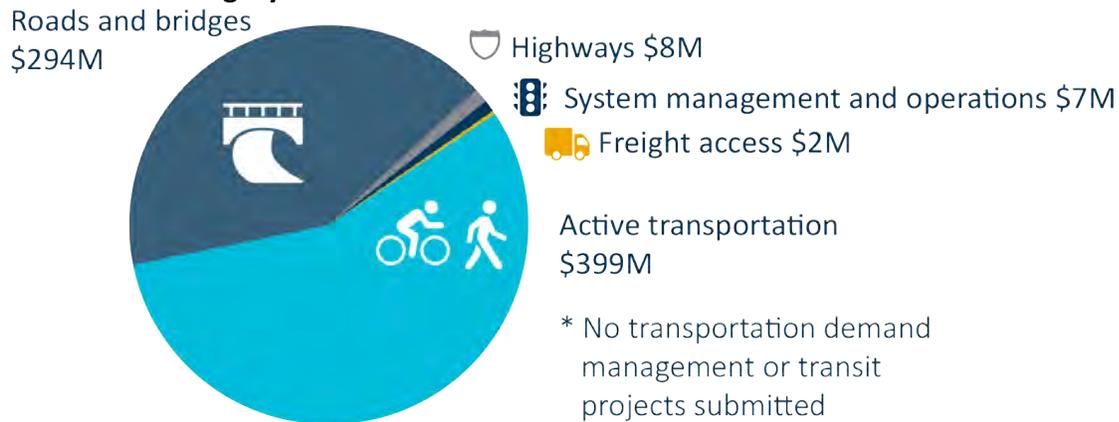


Figure 6.9 Clackamas County 2040 Constrained RTP: Number of capital projects by investment category



Unlike the region as a whole, in Multnomah County, Roads and Bridges projects comprise a majority of costs and number of projects. See figures below.

Figure 6.10 Multnomah County 2040 Constrained RTP: Cost of capital projects by investment category

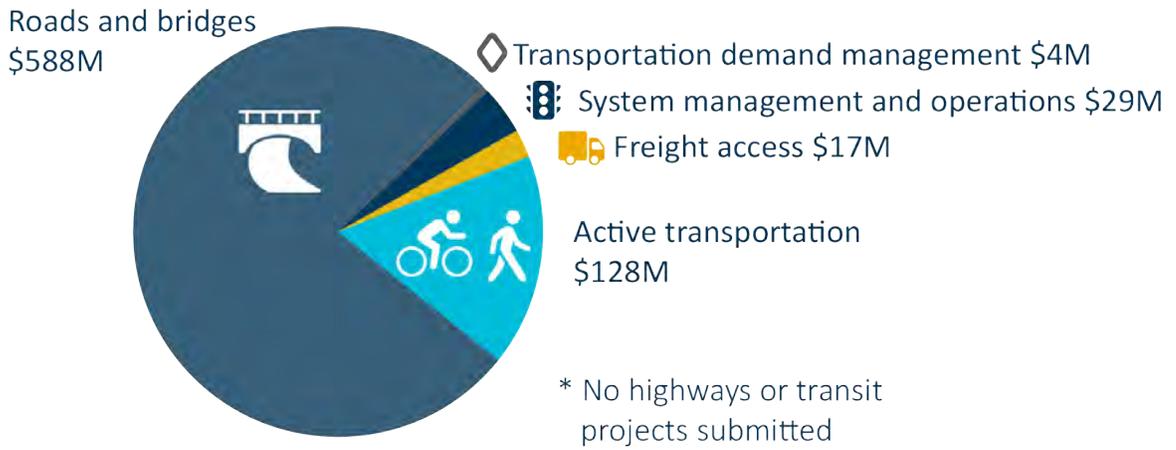


Figure 6.11 Multnomah County 2040 Constrained RTP: Number of capital projects by investment category



Unlike the region as a whole, in Washington County (as in Multnomah County), Roads and Bridges projects comprise a majority of costs and number of projects. See figures below.

Figure 6.12 Washington County 2040 Constrained RTP: Cost of capital projects by investment category

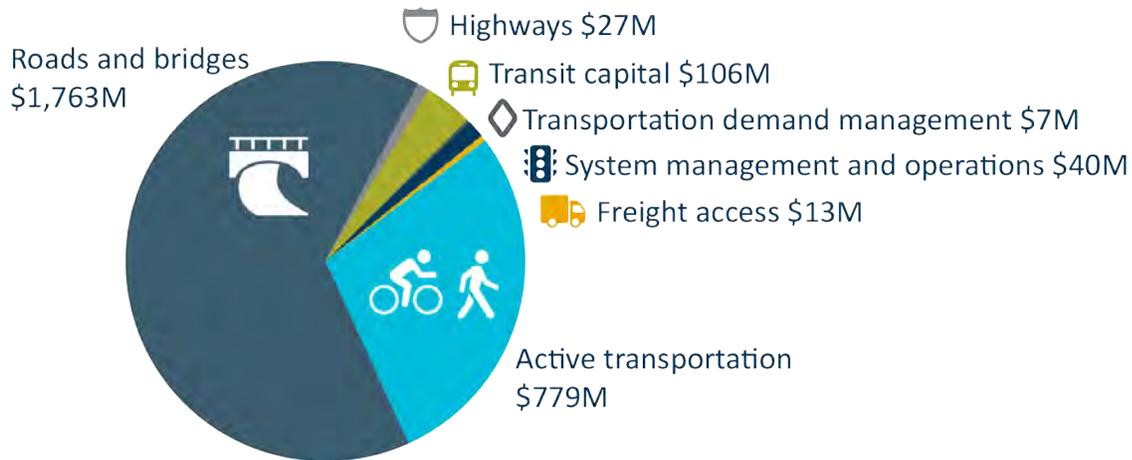
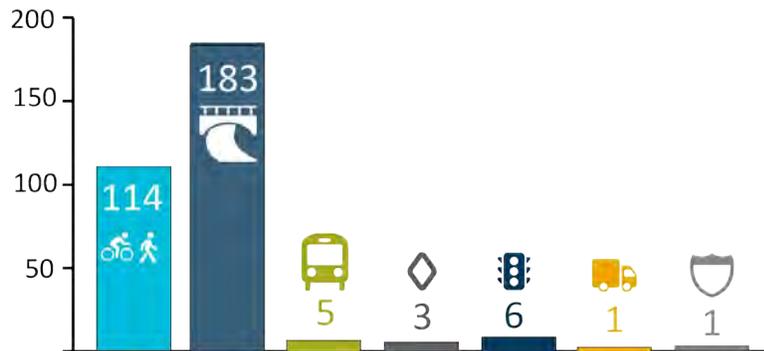


Figure 6.13 Washington County 2040 Constrained RTP: Number of capital projects by investment category



Map 6.14 shows the general location of projects on the 2027 and 2040 Constrained list of projects. For an interactive map of the projects visit www.oregonmetro.gov/rtp.

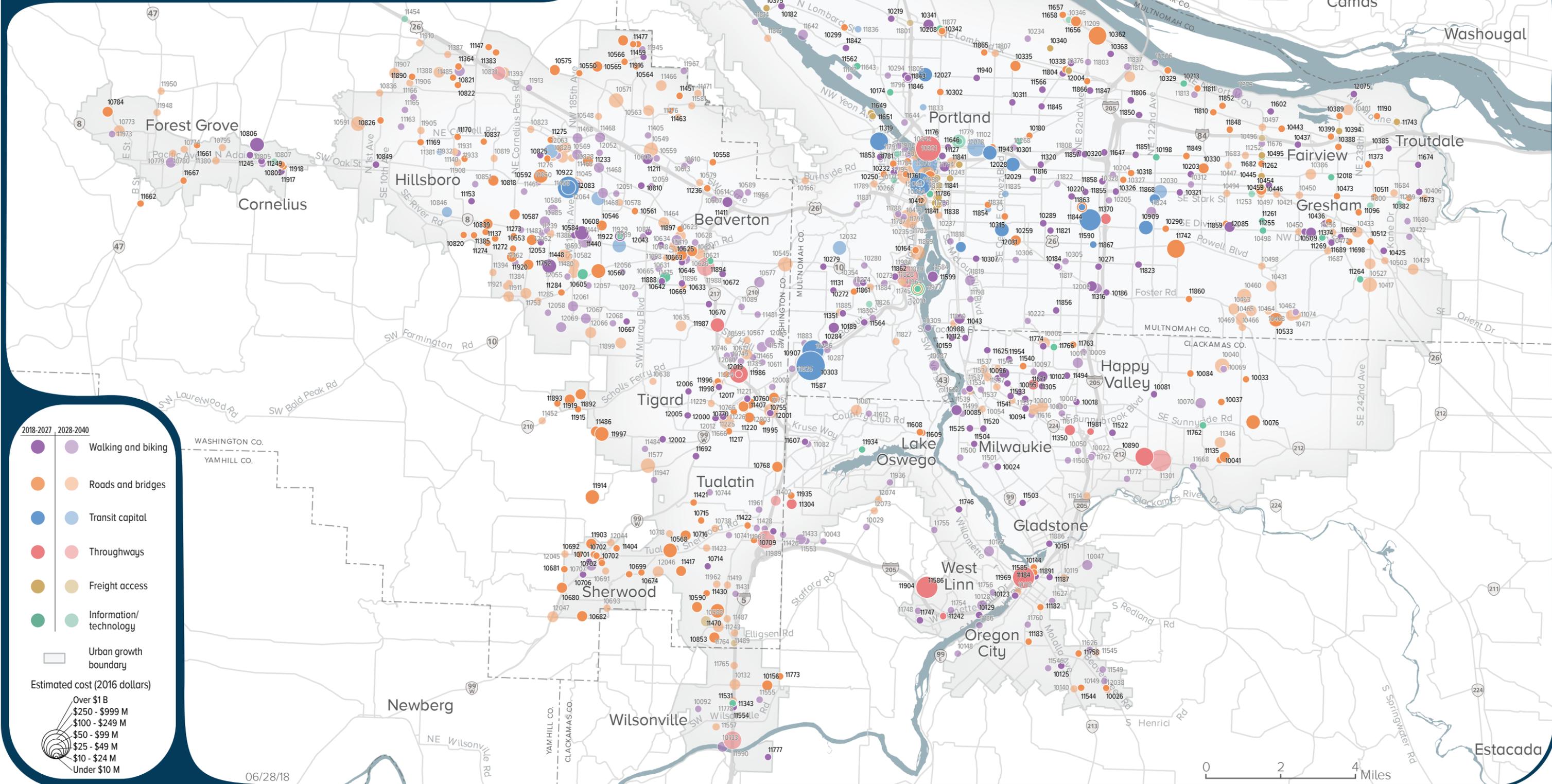
Figure 6.14 Map of Constrained RTP Projects (2018-2040)

Draft 2018 Regional Transportation Plan 2040 Financially Constrained projects

The financially constrained projects are the highest priority projects given limited transportation funding and qualify for regional, state and federal funding. This list of projects includes projects for which funding has been committed and projects that can be implemented with the funds the region currently expects to have available.

These projects have been divided into two investment time frames; 2018-2027 and 2028-2040.

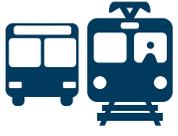
For more information and to access an interactive online map, visit <https://arcg.is/1WT9Gq>



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Table 6.3 provides an overview of the major Throughway and transit projects in the RTP.

Table 6.3 Summary of major throughway and transit investments

	2027 Constrained	2040 Constrained	2040 Strategic
Throughways 	<ul style="list-style-type: none"> ▪ I-5 Rose Quarter ▪ I-5 south and I-205 operational improvements ▪ OR 217 NB and SB auxiliary lanes ▪ I-205 auxiliary lane (in Portland) ▪ I-205 SB widening to three lanes in each direction ▪ I-205/Abernethy Bridge widening ▪ OR 224 widening (third WB lane) 	2027 Constrained, plus <ul style="list-style-type: none"> ▪ I-5/Columbia River Crossing (with tolling as defined in adopted LPA) ▪ US 26 widening to Brookwood Road ▪ OR 217 braided ramps ▪ More I-205 auxiliary lanes ▪ Sunrise Project, Phase 2 ▪ I-5/Boone Bridge SB auxiliary lane ▪ I-5 NB braided ramps from I-205 to Nyberg Road 	2040 Constrained, plus <ul style="list-style-type: none"> ▪ I-5/OR 217 Interchange Phase 2 ▪ OR 217 operational improvements and widening to three lanes in each direction ▪ OR 217 auxiliary lane from Denney to Scholls Ferry Road ▪ Sunrise Project, Phase 3 ▪ More I-5 auxiliary lanes ▪ Operational improvements on I-205, I-84, I-405 and US 26
Transit 	High Capacity Transit <ul style="list-style-type: none"> ▪ Southwest Corridor Project ▪ Division Transit Project ▪ Red Line Improvements Project ▪ Central City Transit Capacity Analysis Enhanced transit concept - hotspots <ul style="list-style-type: none"> ▪ Streetcar upgrades on Grand Avenue in Portland ▪ Central City Portals (downtown Portland bridges) ▪ 82nd Avenue ETC (NE Killingsworth Street to SE Clatsop Street) 	2027 Constrained, plus <p>High Capacity Transit</p> <ul style="list-style-type: none"> ▪ Portland to Vancouver ▪ Steel Bridge Transit Bottleneck <p>Enhanced transit concept - hotspots</p> <ul style="list-style-type: none"> ▪ Inner North Portland ETC (Portland Central City to N Lombard Street) ▪ Caesar Chavez ETC (Sandy to Powell) ▪ Lombard Street ETC (St. Johns to MLK Jr. Boulevard) ▪ SE Hawthorne/50th Avenue ETC (Willamette River to SE Powell) 	2040 Constrained, plus <p>High Capacity Transit</p> <ul style="list-style-type: none"> ▪ HCT extension to Oregon City via McLoughlin ▪ HCT on I-205 (Clackamas to Bridgeport) ▪ Expansion of WES to all-day service ▪ WES extension to Salem ▪ Sunset Highway HCT (Sunset transit center to Hillsboro Fairplex) ▪ HCT extension to Forest Grove

	2027 Constrained	2040 Constrained	2040 Strategic
	<ul style="list-style-type: none"> ▪ Powell Boulevard ETC (SE Portland to I-205) <p>Enhanced transit concept - corridors</p> <ul style="list-style-type: none"> ▪ 122nd Avenue ETC (Lents to Parkrose transit center) ▪ Martin Luther King Jr. Boulevard ETC (Portland Central City to N Vancouver Boulevard) ▪ Sandy Boulevard ETC (Portland Central City to Parkrose TC) ▪ 82nd Avenue ETC (Swan Island to Clackamas town center) ▪ Hawthorne Boulevard/Foster Road ETC (downtown Portland to Lents town center) ▪ Streetcar to Montgomery Park in NW Portland 	<p>Enhanced transit concept - corridors</p> <ul style="list-style-type: none"> ▪ Tualatin Valley Highway multimodal project (Maple Street to 160th Avenue) ▪ E. Burnside/SE Stark Street ETC (Portland to Gresham) ▪ Tualatin Valley Highway ETC from Beaverton to Forest Grove ▪ Beaverton-Hillsdale Highway ETC from Portland to Washington Square ▪ Cornell/Barnes ETC (Sunset transit center to Hillsboro TC) ▪ 185th/Farmington Road ETC (PCC Rock Creek to Beaverton transit center) ▪ Streetcar on NE Broadway to Hollywood town center 	<p>Enhanced transit concept - corridors</p> <ul style="list-style-type: none"> ▪ SE Powell Boulevard ETC (Portland to extent TBD) ▪ Lombard/Caesar Chavez ETC (St. Johns to Milwaukie town center) ▪ Belmont Street ETC (Portland to Gateway transit center) ▪ Streetcar on Martin Luther King Jr. Boulevard in NE Portland ▪ Streetcar in AmberGlen in Hillsboro ▪ Streetcar to Johns Landing in SW Portland

Note: ETC investments are identified on existing and planned frequent service bus routes and will be further defined through the Regional Transit Strategy and the Enhanced Transit Concept (ETC) Pilot Program.

6.3.3 Transit capital projects

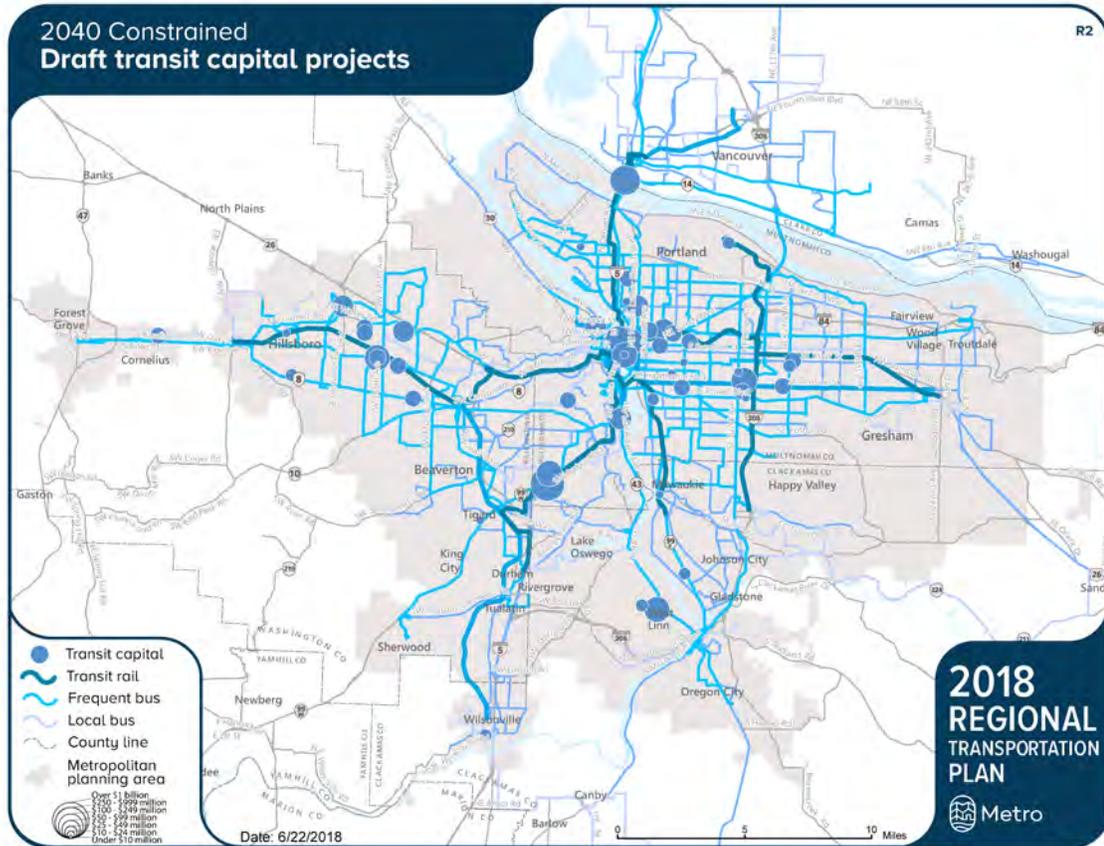
As shown in **Table 6.4**, transit capital projects in the 2040 Constrained project list include several enhanced transit corridors and high capacity transit projects. Transit investments make up about 1/3 of the 2040 Constrained project list. (\$5.1 billion out of \$15.4 billion)

Table 6.4 Summary of Transit Capital Projects in Constrained RTP

Transit capital projects	Climate Smart Strategy 2010-2035	 2018–2027	 2018–2040
Number of transit capital projects	<i>Not evaluated</i>	19	33
Number of transit capital projects on a high injury corridor	<i>Not evaluated</i>	14	27
Daily revenue hours	9,400	8,100	9,500
Service expansion	44% increase from 2010	38% increase from 2015	60% increase from 2015
New high capacity transit connections	MAX extension to Vancouver; WES operates all day with 15-min service and bus rapid transit in five corridors: Southwest, Division Street, I-205 South, Tualatin Valley Highway to Forest Grove, and McLoughlin Boulevard to Oregon City	4 HCT projects, including Division Transit, Southwest Corridor, Red Line extension and the Central City Capacity Analysis	2 additional HCT projects (from 2027 Financially Constrained): HCT connecting Portland to Vancouver, WA, improvements on the Steel Bridge
Other service enhancements	4 new streetcar connections, further implementation of locally-developed SMART and TriMet service enhancement plans	9 enhanced transit projects and 1 streetcar extension to Montgomery Park	10 additional enhanced transit projects and 1 streetcar extension to Hollywood (from 2027 Financially Constrained)

Transit capital projects	Climate Smart Strategy 2010-2035	 C10 2018–2027	 C 2040 2018–2040
Public and private shuttles	More major employers and some community-based organizations work with TriMet to operate shuttles	More major employers and some community-based organizations work with TriMet to operate shuttles	More major employers and some community-based organizations work with TriMet to operate shuttles
Fares	Reduced fares provided to youth, older adults, people with disabilities and low-income families	Reduced fares provided to youth, older adults, people with disabilities and low-income families	Reduced fares provided to youth, older adults, people with disabilities and low-income families
Estimated capital cost (\$2016)	\$4.7 billion	\$3.2 billion	\$5.1 billion

Figure 6.5 Transit Capital Projects Map



6.3.4 Throughway projects for safe and reliable long-distance travel

Maintenance and efficient operation of the existing throughway system is critical. Keeping throughways in good repair and using information and technology to manage travel demand and traffic flow help improve safety and boost efficiency of the existing system. With limited funding, more effort is being made to maximize system operations prior to building new capacity in the region. Building a connected roadway network will also preserve the throughway system for longer-distance, freight and transit trips.

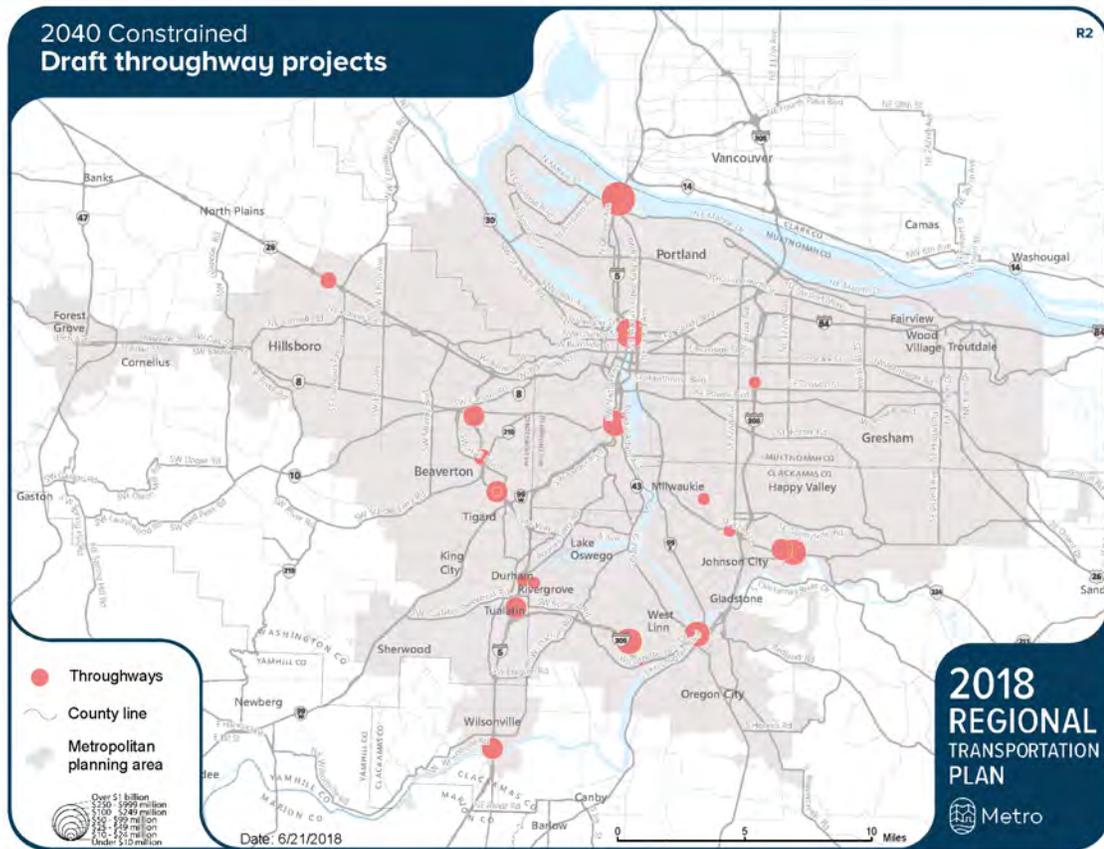
Adding lane miles to relieve congestion is an expensive approach and will not solve congestion on its own. However, targeted widening of roads and throughways, along with connectivity and system and demand management strategies, can help connect goods to market and support travel across the region.

Throughway projects comprise about 3 percent of projects in the 2040 Constrained project list. Strategic throughway capacity was added to maintain regional mobility and enhance access to intermodal industrial areas and facilities where goods move from one transportation mode to another. **Table 6.6** lists the major throughway capital projects in the 2040 constrained list.

Table 6.6 Summary of Transit Capital Projects in Constrained RTP

Throughway capital projects	Climate Smart Strategy 2010-2035	 2018–2027	 2018–2040
Number of throughway projects	<i>Not evaluated</i>	17	24
Number of throughway projects with safety benefit	<i>Not evaluated</i>	4	12
Number of throughway projects on high injury corridor	<i>Not evaluated</i>	13	19
Throughway capacity – including auxiliary lanes	52 new lane miles	27 new lane miles	50 new lane miles
New major throughway capacity	<i>Not evaluated</i>	Sunrise Highway Phase 2, I-5 Rose Quarter	I-5 Columbia River Crossing, I-5 auxiliary lanes
Estimated capital cost (\$2016)	\$4.1 billion	\$1.1 billion	\$4.6 billion

Figure 6.15 Throughway Projects Map



6.3.5 Roads and bridges projects for a safe, reliable and connected system

Nearly 45 percent of all trips in the region made by car are less than three miles, and 15 percent are less than one mile, based on the 2011 Oregon Household Activity Survey. When road networks lack multiple routes serving the same destinations, short trips must use major travel corridors designed for freight and regional traffic, adding to congestion.

There are three key ways to make roads and bridges safe, reliable and connected for people walking, driving biking and taking transit.

Maintenance and efficient operation of the existing road system Keeping the road system in good repair and using information and technology to manage travel demand and traffic flow help improve safety and boost efficiency of the existing system. With limited funding, more effort is being made to maximize system operations prior to building new capacity in the region.

Street connectivity and complete streets Building a well-connected network of complete streets including new local and major street connections shortens trips,

improves overall network efficiency, improves access to community and regional destinations, and helps preserve the capacity and function of highways in the region for freight and longer trips. These connections include designs that support walking and biking and, in some areas, provide critical freight access between industrial areas, intermodal facilities and the interstate highway system.

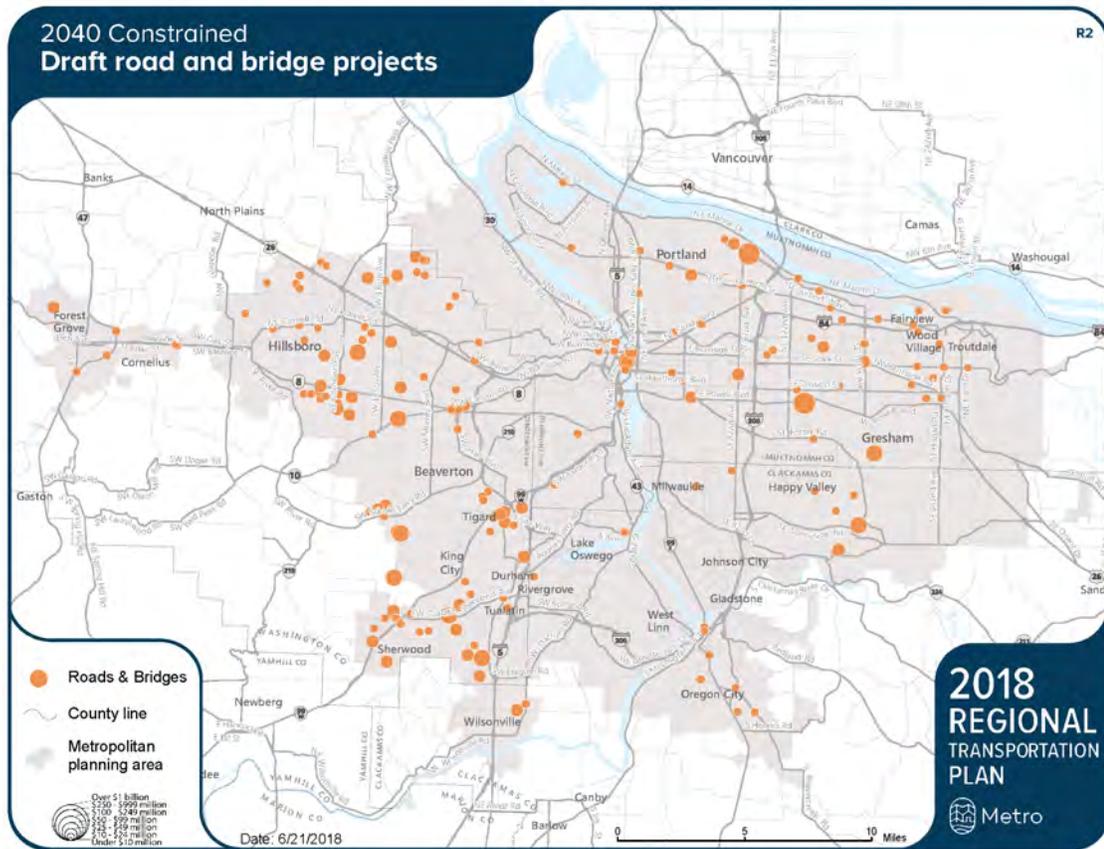
Network expansion Adding lane miles to relieve congestion is an expensive approach and will not solve congestion on its own. However, targeted widening of roads and throughways, along with connectivity and system and demand management strategies, can help connect goods to market and support travel across the region.

Road and bridges projects about 42 percent of the 2040 Constrained project list. Road and bridge projects include arterial street expansions and street reconstructions that are complemented by new connections to maintain access to the regional throughway system and provide circulation and access between the central city, regional centers and town centers.

Table 6.7 Summary of Roads and Bridges Projects in Constrained RTP

Roads and bridges capital projects	Climate Smart Strategy 2010-2035	 2018-2027	 2018-2040
Number of roads and bridges projects	<i>Not evaluated</i>	175	340
Number of roads and bridges projects with safety benefit	<i>Not evaluated</i>	100	183
Number of roads and bridges projects on a high injury corridor	<i>Not evaluated</i>	104	196
Arterial roadway capacity	386 new lane miles	167 new lane miles	289 new lane miles
New major arterial capacity	<i>Not evaluated</i>	Tualatin-Sherwood Rd, Farmington Rd, Sunnyside Rd east extension	172 nd -190 th connector, Rock Creek Blvd, Scholls Ferry Rd
Estimated capital cost (\$2016)	\$5.2 billion	\$1.5 billion	\$3.3 billion

Figure 6.8 Constrained RTP Roads and Bridges Projects Map



6.3.6 Freight access projects to move goods and services in safe, reliable, connected and sustainable ways

The greater Portland region is the trade and transportation gateway for Oregon and provides market access for many southwest Washington businesses. Our prosperity is directly tied to the investments we make in our transportation system, including the region’s freight infrastructure. These investments make consumer goods readily available to us; provide air, ship, rail and road systems that help our businesses efficiently reach global and domestic marketplaces; and create family-wage jobs across the region.

Freight reliability and safety Facilitate the safe, reliable and efficient movement of goods by better utilizing existing road and freight rail infrastructure and capacity, separating freight traffic from other modes to increase safety and minimize conflicts, and strategically investing in the regional freight network to eliminate road and rail bottlenecks that create serious freight congestion.

Freight network connectivity Provide shippers with the ability to transfer freight seamlessly between different modes of transportation, as well as efficient access to local freight clusters and delivery points and regional, domestic and global markets.

Intermodal freight facilities and connectors Invest in intermodal facilities and freight intermodal connectors (e.g., reload facilities, marine ports, rail yards, freight access roads, etc.) that reduce highway demand for freight.

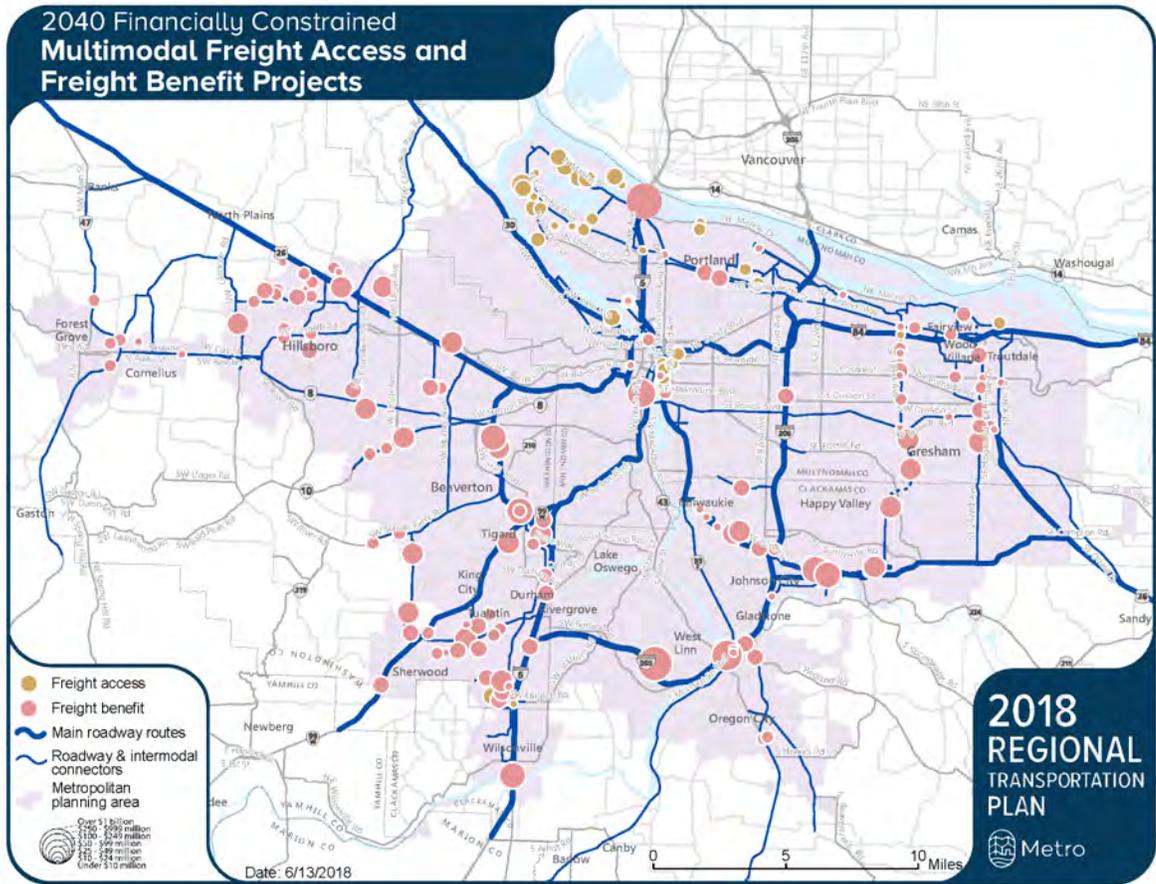
Smart technology Make use of intelligent transportation systems and emerging technologies to improve traffic flow along goods movement corridors.

Freight projects in the 2040 Constrained project list are focused on maintaining access and connections for national and international rail, air and marine freight to reach destinations within the region’s industrial areas. Freight projects comprise five percent of the 2040 Constrained project list.

Table 6.9 Summary of Freight Access Projects in Constrained RTP

Freight access capital projects	Climate Smart Strategy 2010-2035	 2018–2027	 2018–2040
Number of freight access projects	<i>Not evaluated</i>	25	38
Number of freight access projects with a safety benefit	<i>Not evaluated</i>	8	12
Number of freight access projects on a high injury corridor	<i>Not evaluated</i>	10	14
Freight network lane miles	<i>Not evaluated</i>	61	105
New major freight access capacity projects	<i>Not evaluated</i>	Rivergate Blvd overcrossing, T4 modernization, Marine Drive Improvement Phase 2	Cully Blvd Grade separation, Columbia Blvd Rail Bridge, Going/Greeley Interchange
Estimated capital cost of freight access projects (\$2016)	<i>Not evaluated</i>	\$156 million	\$248 million

Figure 6.16 Constrained RTP Freight Access and Freight Benefits Projects Map



6.3.7 Active transportation projects to make biking and walking safe, convenient and accessible

Active transportation is considered non-motorized forms of transportation including walking and biking. Making it safe and convenient to walk, ride a bicycle and get to public transit benefits people and the environment in multiple ways. Active transportation is good for business, for household pocket books, for cleaner air and water, for public health and safer streets.

Approximately 45 percent of all trips made by car in the region are less than three miles and 15 percent are less than one mile, according to the 2011 Oregon Household Activity Survey. With complete walking and biking routes supported by education and incentives, many of the short trips made by car today could be replaced by walking and biking. There are four key ways to make biking and walking safe and convenient for people of all ages and abilities in our region.

Fill the gaps Completing missing sidewalks, pedestrian crossings, bikeways and multi-use paths creates complete streets and better connectivity, removes barriers; adds routes

across highways, railroads and waterways; makes high injury locations safer; and shortens trip distances and travel time.

Design for safety Designing bikeways and walking routes with greater separation and buffers from traffic increase safety and reduce the risk of traffic deaths. Making it safer for people walking and biking makes travel safer for all modes.

Meet the demand Upgrading high demand bikeways and walking routes and prioritizing active travel in high demand areas provides reliable travel options in congested corridors, reduces the need to drive and increases livability.

Safe Routes to School Providing programs and safe walking and biking routes to schools is proven to reduce driving trips and create healthy options for kids.

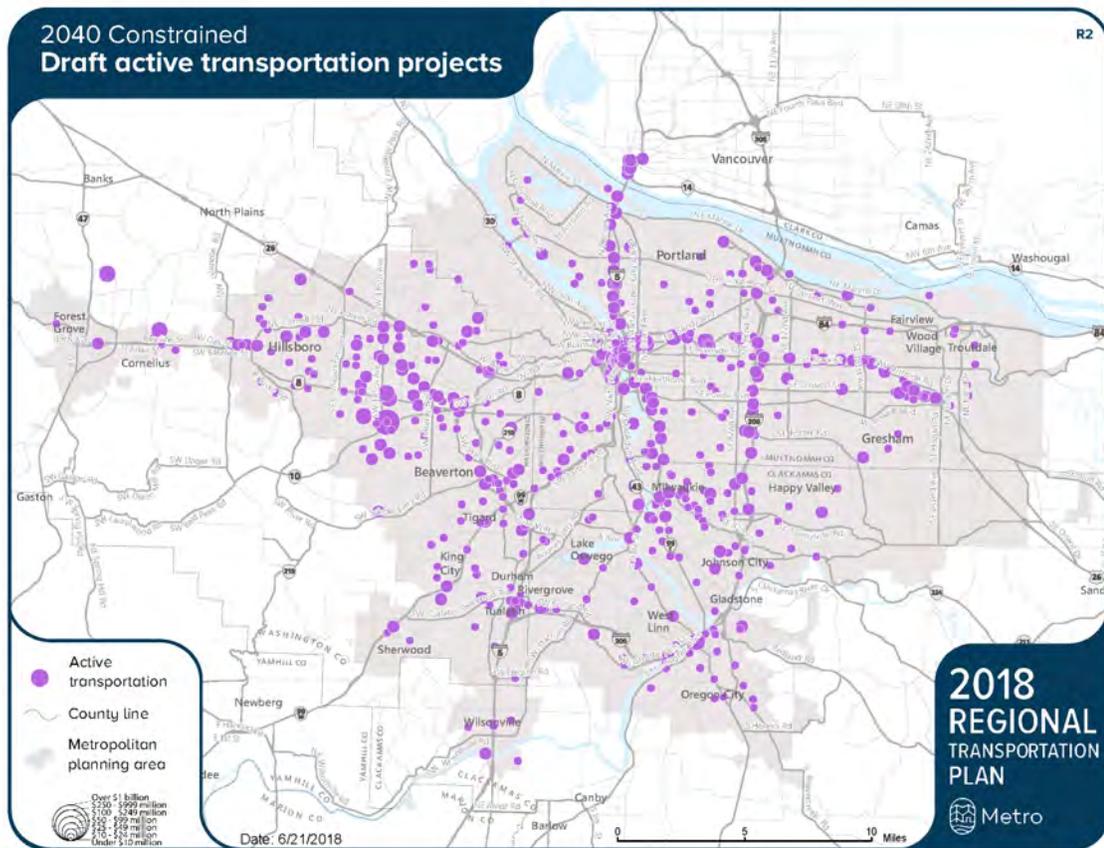
Active transportation investments have become a growing focus around the region and comprise 40% of all the 2040 Constrained list. RTP Active Transportation projects include streets, trails, and districts identified primarily to benefit pedestrian and bicycling.

Table 6.17 Summary of Active Transportation Projects in Constrained RTP

Active transportation projects	Climate Smart Strategy 2010-2035	 C¹⁰ 2018–2027	 C 2040 2018–2040
Number of active transportation projects	<i>Not evaluated</i>	154	325
Number of active transportation projects with a safety benefit	<i>Not evaluated</i>	148	317
Number of active transportation projects on a high injury corridor	<i>Not evaluated</i>	106	202
Sidewalk, bikeway and trail projects	663 miles added	183 miles added	412 miles added
Examples of active transportation projects	<i>Not evaluated</i>	Aloha-Reedville pedestrian Improvements, Council Creek Regional Trail, Division-Midway Connected Centers project, Westside	Lake Oswego to Portland Trail, Reedway Bike/ped overcrossing, Washington County pedestrian arterial crossings, East-Buttes Loop Trail

Active transportation projects	Climate Smart Strategy 2010-2035	 2018-2027	 2018-2040
		Trail Hwy 26 bridge crossing, Milwaukie Monroe Street Neighborhood Greenway	
Active transportation projects with safety benefit	<i>Not evaluated</i>	148	409
Estimated capital cost (\$2016)	\$2.2 billion	\$770 million	\$1.8 billion

Figure 6.18 Constrained RTP Active Transportation Projects Map



6.3.8 Transportation system management and operations projects to manage the system

Using technology to actively manage the greater Portland region's transportation system means using intelligent transportation systems and services to reduce vehicle idling associated with delay and help improve the speed and reliability of transit. Nearly half of all congestion is caused by incidents and other factors that can be addressed using these strategies.

Local, regional and state agencies work together to implement transportation system technologies. Agreements between agencies guide sharing of data and technology, operating procedures for managing traffic, and the ongoing maintenance and enhancement of technology, data collection and monitoring systems.

Arterial corridor management Advanced technology at each intersection actively manages traffic flow. This may include coordinated or adaptive signal timing; advanced signal operations such as cameras, flashing yellow arrows, bike signals and pedestrian count down signs; and communication to a local traffic operations center and the centralized traffic signal system.

Freeway corridor management Advanced technology manages access to the freeways, detects traffic levels and weather conditions, provides information with message signs and variable speed limit signs, and deploys incident response patrols that quickly clear breakdowns, crashes and debris. These tools connect to a regional traffic operations center.

Traveler information Variable message and speed limit signs and 511 internet and phone services provide travelers with up-to-date information regarding traffic and weather conditions, incidents, travel times, alternate routes, construction and special events.

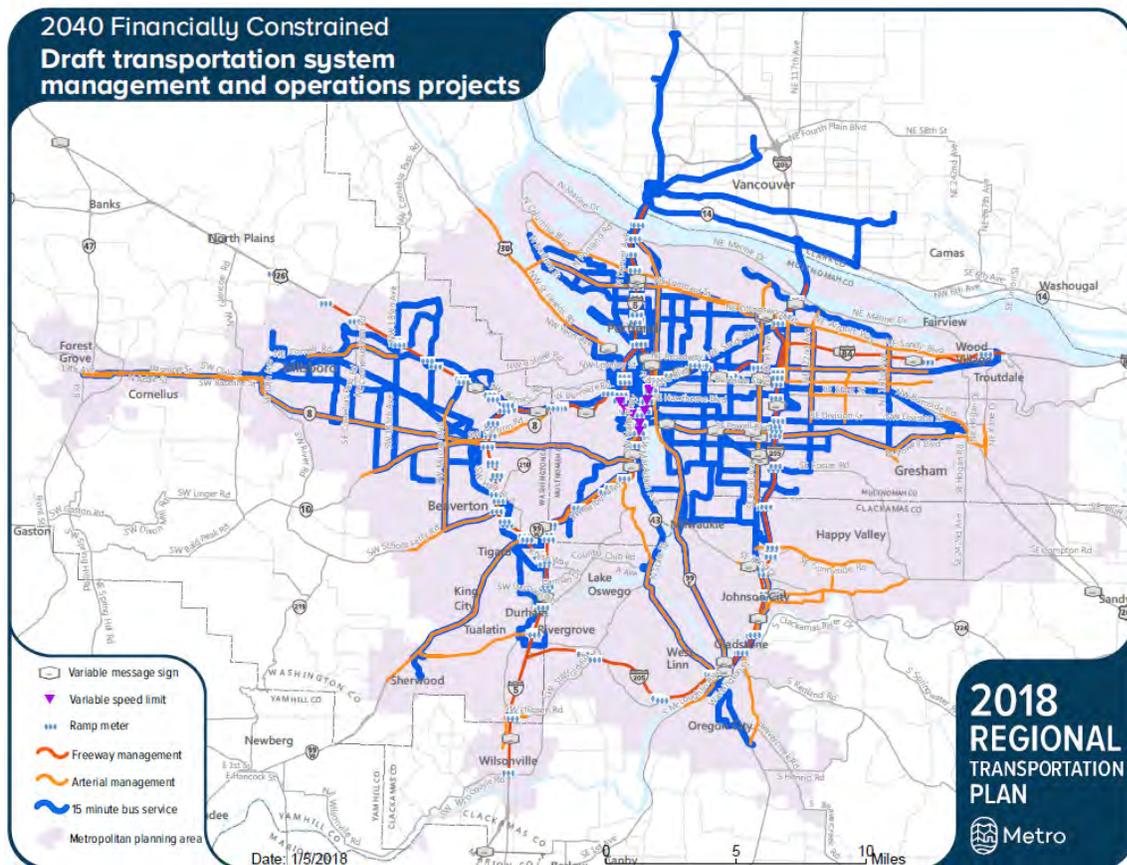
Many RTP projects are focused entirely around implementing new technology or maximizing existing technology to improve network connectivity. Transportation system management and operations (TSMO) represent 5 percent of the 2040 Constrained list of projects.

Table 6.19 Summary of Transportation System Management and Operations Projects in Constrained RTP

Transportation system management and operations projects	Climate Smart Strategy 2010-2035		
Provide for real-time and forecasted traveler information	<i>Not evaluated</i>	Information on current travel conditions and alerts are available to the public and third party developers	Current Conditions data is used by operators to forecast changing travel conditions
Multimodal integrated corridor management	Agencies integrate operations strategies in some of the region's major travel corridors	Agencies integrate operations strategies in a few of the region's major travel corridors	Agencies integrate operations strategies in some of the region's major travel corridors
Advanced traffic signal operations	All traffic signals are interconnected in a centralized system	Traffic signals are interconnected in some industrial areas and major travel corridors	Traffic signals are interconnected in some industrial areas and major travel corridors
Transit signal priority	All bus routes with 10-minute service	Some frequent bus routes	Most frequent bus routes
Freeway ramp meters	All urban interchanges	All urban interchanges	All urban interchanges
Freeway variable speed signs	All high incident locations	Some high incident locations	Most freeways
Incident response vehicles	Incident response vehicles monitor all area freeways and major arterials adjacent to	Incident response vehicles monitor some high incident locations	Incident response vehicles monitor all area freeways and major arterials adjacent to freeways

Transportation system management and operations projects	Climate Smart Strategy 2010-2035	C10 2018–2027	C 2040 2018–2040
	freeways		
Estimated capital cost (\$2016)	\$219 million	\$71 million	\$189 million

Figure 6.20 Constrained RTP Transportation System Management Projects Map



6.3.9 Transportation demand management projects to expand the use of travel options

Public awareness, education and travel options support tools are cost-effective ways to improve the efficiency of the existing transportation system through increased use of travel options such as walking, biking, carsharing, carpooling and taking transit. Local, regional and state agencies work together with businesses and non-profit organizations to implement programs in coordination with other capital investments. Metro coordinates partners' efforts, sets strategic direction, Wilson, evaluates outcomes and manages grant funding.

Public awareness strategies Events and other outreach strategies provide information about and encourage the public’s use of travel options.

Commuter programs Employer-based commuter outreach efforts include: financial incentives, such as transit pass programs and offering cash instead of parking subsidies; facilities and services, such as carpooling programs, bicycle parking, emergency rides home and work-place competitions; and flexible scheduling such as working from home or compressed work weeks.

Individualized marketing Focused outreach encourages individuals, families or employees interested in making changes in their travel choices to participate in a program. A combination of information and incentives is tailored to each person’s or family’s specific travel needs. This outreach can be part of a comprehensive commuter program.

Travel options support tools Reduce barriers to travel options and support continued use with tools, such as online rideshare matching, trip planning tools, wayfinding signage, bike racks and carsharing.

Transportation demand management (TDM) projects comprise 2 percent of the 2040 Constrained list of projects.

Table 6.10 Summary of Transportation Demand Management Projects in Constrained RTP

Transportation demand management projects	Climate Smart Strategy 2010-2035	 C10 2018–2027	 C 2040 2018–2040
Local program implementation	n/a	All cities with >30k population lead travel options efforts, covering about 80% of regional population	All cities with >20k population lead travel options efforts, covering about 90% of regional population
Individualized marketing participation	60% of households plus the addition of Safe Routes to school and equity-based campaigns	Current program reaches about 3% of households	TBD% of employees reached
Commuter program	40% of employees	TBD% of employees reached (same as	TBD% of employees

Transportation demand management projects	Climate Smart Strategy 2010-2035		
participation	reached Oregon Employee Commute Options rule include work sites with more than 100 employees to have workplace programs	2015) Oregon Employee Commute Options rules require work sites with more than 100 employees to have workplace programs	reached
Public awareness marketing campaign	60% of public reached Existing ongoing and short-term campaigns lead to more awareness of <i>DriveLess. Connect.</i> Plus added resources promote new travel tools, safety education and regionally specific campaigns dedicated to safety and underserved communities	TBD% of public reached Existing ongoing and short-term campaigns increase awareness of <i>DriveLess. Connect.</i>	TBD% of public reached Additional resources promote new travel tools, regional efforts and safety education
Provisions of travel options support tools	2010 program funding levels allow for completion of several new wayfinding signage and bike rack projects plus public-	2015 program funding levels allow for completion of several new wayfinding signage and bike rack projects	Additional resources allow for public-private partnerships to create new online, print and on-street travel tools

Transportation demand management projects	Climate Smart Strategy 2010-2035	 2018–2027	 2018–2040
	private partnerships to create new online, print and on-street travel tools, and other support tools		
Estimated capital cost (\$2016)	\$197 million	\$51 million	\$127 million

6.3.10 Other projects and programs to leverage capital investments

The 2040 Constrained investment strategy includes \$105 million in investments to support Transit Oriented Development (\$67 million), regional planning activities and corridor investment area refinement and planning activities (\$38 million).

6.3.11 Transportation equity projects

The RTP reflects a regional commitment to plan and invest in the region’s transportation system to reduce transportation-related disparities and barriers faced by communities of color and other historically marginalized communities, regardless of race, language proficiency, income, age or ability, while maintaining affordability and preventing displacement is necessary.

Out of the 814 projects in the 2040 Constrained investment strategy, 588 capital projects are within an Equity Focus Area. The 2040 Constrained investment strategy shows the combined investment of transit capital projects and active transportation projects in equity focus areas reaches over \$3.9 billion in 2027 and \$6.5 billion by 2040. These comprise around 44 percent of the RTP’s investment by 2040. Refer to Chapter 7 and to Appendix E for information on how the investment strategies of the RTP impact historically marginalized communities in the greater Portland region.

Defining terms

Equity Focus Area
 Census tracts with higher than regional average concentrations and double the density of one or more of the following: people of color, English language learners, and/or people with lower income. Most of these areas also include higher than regional average concentrations of other historically marginalized communities, including young people, older adults and people living with disabilities.

6.3.12 Safety projects and safety benefit projects

Eliminating traffic related deaths and life-changing injuries and increasing transportation safety is a priority of the RTP. To address safety and reduce serious crashes, the RTP project list identifies projects that provide an overall safety benefit, as well as projects that have the primary purpose of reducing fatal and severe injury crashes, or minor/non-injury crashes at a documented high injury or high risk location.

Safety projects and safety benefit projects are targeted towards the Regional High Injury Corridors and Intersections and in race and income marginalized communities (equity focus areas).

Of the 814 projects on the 2040 Constrained list:

- **Safety Projects:** 132 projects, or 16 percent of all 2040 Constrained projects, identify reducing fatal and severe injury crashes or reducing minor/non-injury crashes as the primary purpose of the project. Eighty-one percent of these primary purpose projects are located on a high injury corridor, and seventy-five percent are in an equity focus area. (See Projects with Primary Purpose of Reducing Crashes map below.)
- **Safety Benefit Projects:** 546 projects, or 67 percent of all 2040 Constrained projects, have been identified to provide a safety benefit. Forty-six percent of the Safety Benefit projects are on a high injury corridor, and 75percent are located in an equity focus area. (See Projects with a Safety Benefit map below.)
- **All projects on High Injury Corridors:** 507 projects or 62 percent of all projects intersect with a regional high injury corridor. Of these projects, 152 are not identified as Safety Benefit projects because some are roadway extensions, some are transit projects, some are ITS projects, etc. These projects provide other benefits that are critical to the transportation system.
- **Programs that impact safety:** In addition to capital projects, the Safe Routes to School, Transit Oriented Development and Transportation System Management and Operations programs provide safety benefits.

Defining terms

Safety project

A project which has the primary purpose reducing fatal and severe injury crashes or reducing minor/non-injury crashes by addressing a documented safety problem at a documented high injury or high risk location with one or more proven safety counter measures.

Safety benefit project

A project that includes design features that increase safety for one or more roadway user, but may not necessarily address an identified safety issue at an identified high injury or high risk location.

Table 6.11 Summary of Safety Projects in Constrained RTP

	Climate Smart Strategy 2010-2035	 2018-2027	 2018-2040
Safety projects			
Number of safety projects with the primary purpose of reducing crashes	n/a	82	132
Number of safety projects on a High Injury Corridor	n/a	72	107
Number of safety projects in Equity Focus Areas	n/a	68	99
Estimated investment in safety projects (\$2016) <i>includes I-5 Rose Quarter Improvement project in first ten years for \$390 million</i>	n/a	\$650 million	\$ 1 billion
Safety benefit projects			
Number of safety benefit projects	n/a	272	546
Number of safety benefit projects on a High Injury Corridor	n/a	196	256
Number of safety benefit projects in Equity Focus Areas	n/a	219	409
Estimated investment in safety benefit projects (\$2016) <i>includes I-5 Rose Quarter project in first ten years, and I-5 Columbia River and OR 212/224 in 2028-2040 for a total of \$3.6 billion</i>	n/a	\$2.1 billion	\$7.6 billion

Note: for this analysis any project that crossed boundaries between subareas is counted in all subareas. Investment levels are also counted multiple times.

The following maps show the location of safety projects and safety benefit projects.

Figure 6. 21 2018 Regional Transportation Plan Projects with the Primary Purpose of Reducing Crashes shows the location of projects that identified the primary project purpose as either “reduces fatal and severe injury crashes” or “reduces crashes,” overlapped with regional high injury corridors and census tracts with higher than regional average concentrations and double the density of one or more of the following: people of color or English language learners, and/or people with low income.

Figure 6.21 2040 Constrained with the primary purpose of reducing crashes

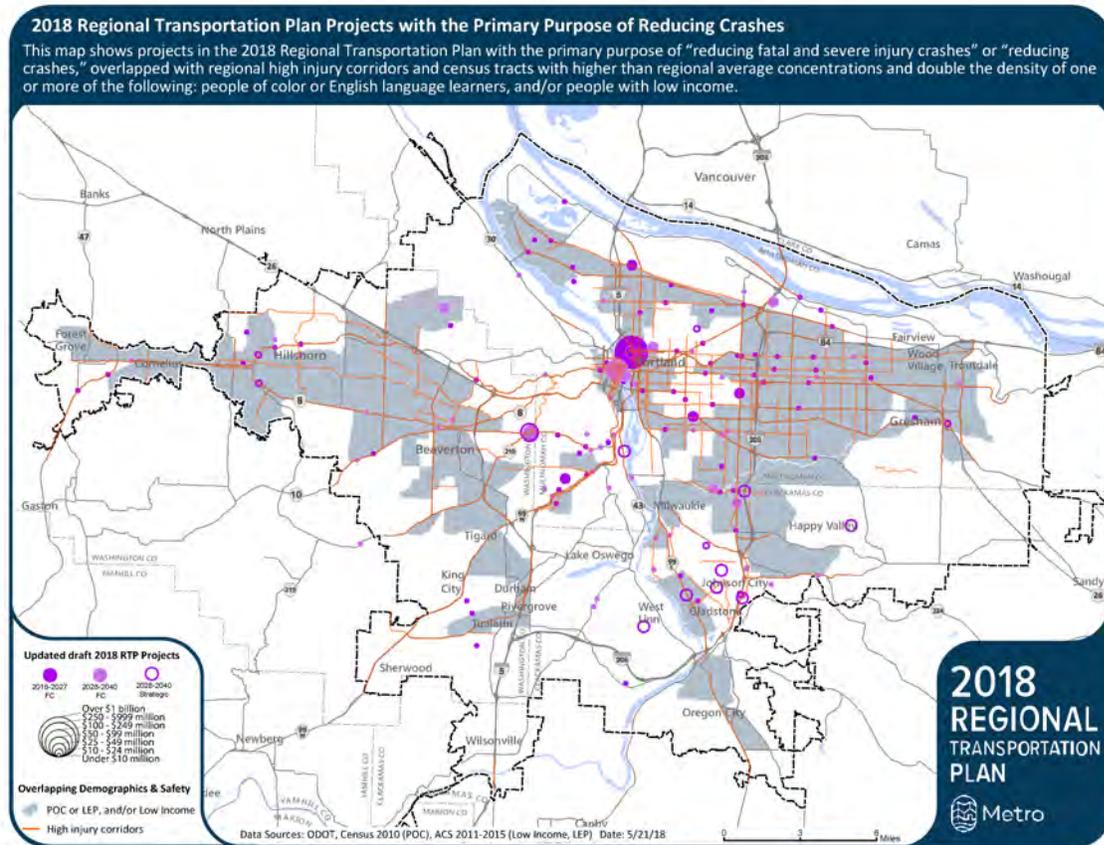
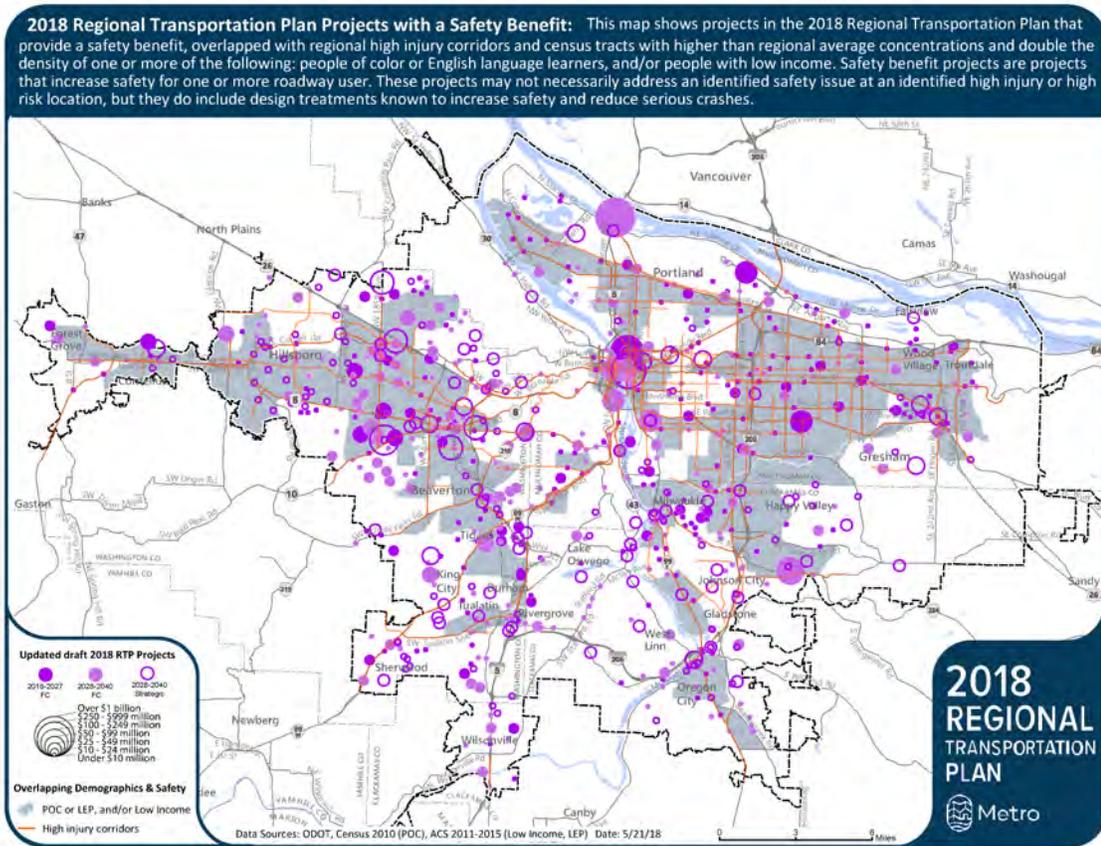


Figure 6.22 2018 Regional Transportation Plan Projects with a Safety Benefit” shows the general location of projects in the 2018 Regional Transportation Plan that provide a safety benefit, overlapped with regional high injury corridors and census tracts with higher than regional average concentrations and double the density of one or more of the following: people of color or English language learners, and/or people with low income.

Figure 6.22 2040 Constrained safety benefit projects



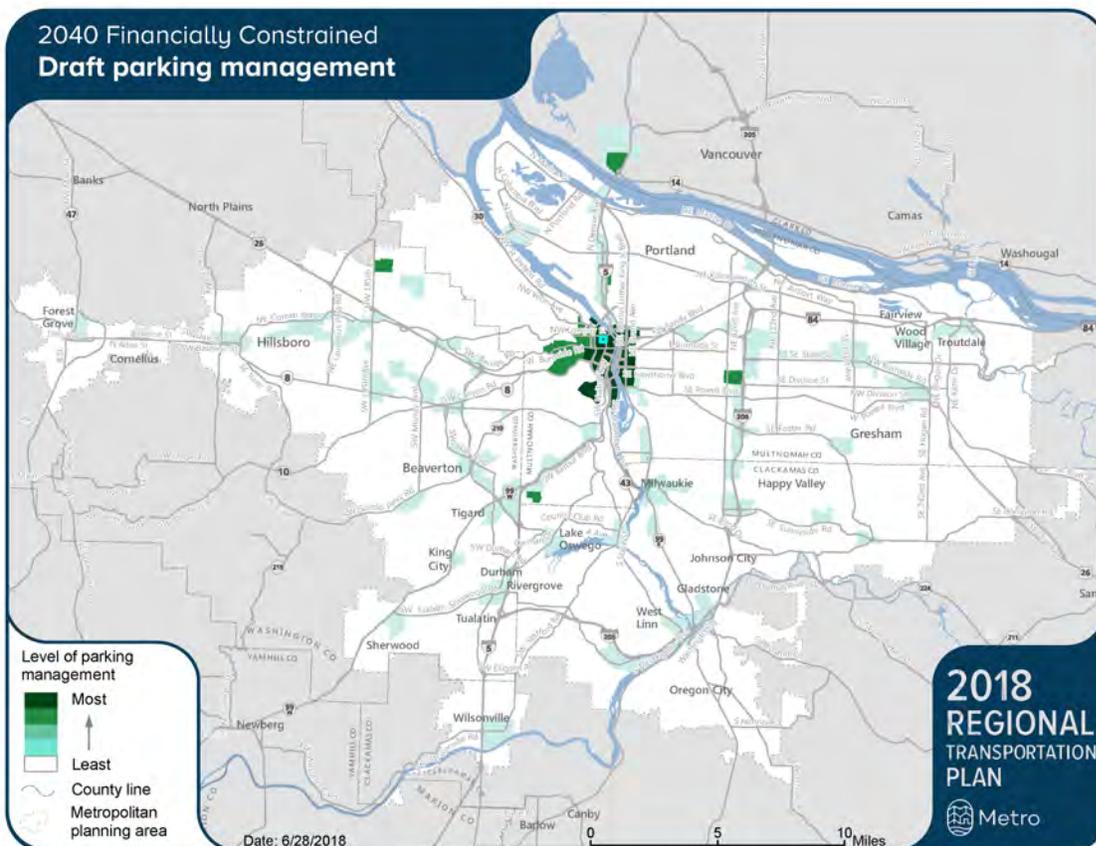
6.3.13 Parking management

Table 6.12 Summary of Parking Management in Constrained RTP

Parking management	Climate Smart Strategy 2010-2035	C10	C
		2018-2027	2018-2040
Local parking management	<p>Communities expand the flexibility of development codes and develop parking plans for all downtowns and centers served by high capacity transit</p> <p>Parking facilities are sized and managed so spaces are</p>	<p>Existing locally-adopted development codes remain the same as 2015</p> <p>Free parking is available in most areas</p>	<p>Communities expand the flexibility of development codes and develop parking plans for all downtowns and centers served by high capacity transit</p> <p>Parking facilities are sized and managed so spaces are frequently occupied, travelers</p>

	frequently occupied, travelers have information on parking and travel options, and some businesses share parking. Free and timed parking is available in many areas.		have information on parking and travel options, and some businesses share parking Free and timed parking is available in many areas
Share of trips to areas with actively managed parking	30% work trips 30% other auto trips	33% work trips 24% other auto trips	32% work trips 23% other auto trips

Figure 6.23 2040 Constrained Parking Management



6.3.14 Transit operations and maintenance

Transit operations and maintenance	Climate Smart Strategy 2010-2035	 2018–2027	 2018–2040
Examples of operating services	<i>Not evaluated</i>	SMART Service to Clackamas Town Center and Oregon City	New bus service Columbia to Clackamas
Examples of maintenance projects	<i>Not evaluated</i>	Preventative maintenance for fleet and vehicles, bus replacements, etc. to keep system in good repair	Preventative maintenance for fleet and vehicles, bus replacements, etc. to keep system in good repair
Estimated service operating costs (\$2016)*	\$8.5 billion	\$5.7 billion	\$13.7 billion

*Operations and maintenance costs are preliminary and will be further updated as the plan is finalized. Operating costs for TriMet service were calculated by annualizing the daily revenue hours proposed for each scenario and applying TriMet’s average operating cost per revenue hour, with cost by mode weighted by the proportion of service provided on each mode. SMART and Portland Streetcar operating costs were calculated by applying each agency’s FY17 annual operating costs.

6.3.15 Throughway, roads and bridges operations and maintenance

Throughway, roads and bridges maintenance	Climate Smart Strategy 2010-2035	 2018–2027	 2018–2040
Level of maintenance	Adequately meet maintenance and preservation needs	Some maintenance backlogs grow	Adequately meet maintenance and preservation needs
Types of maintenance projects	n/a	Bridge and road pavement resurfacing, preventative maintenance, preservation and rehabilitation	Bridge and road pavement resurfacing, preventative maintenance, preservation and rehabilitation
Estimated maintenance cost (\$2016)	\$12.8 billion	\$6 billion	\$13 billion

6.4 THE 2040 STRATEGIC PROJECT LIST

The strategic list of projects reflects additional policy-driven needs and project priorities that exceed our projected funding that could be addressed with additional resources.

Table 6.13 Estimated costs for investment strategies, including 2040 Strategic

RTP Capital Projects Costs	Climate Smart Strategy 2010-2035	 C10 2018–2027	 C 2040 2018–2040	 S 2040 2018–2040
Transit capital	\$4.7 billion	\$3.2 billion	\$5.1 billion	\$6.2 billion
Throughways capital	\$4.1 billion	\$1.1 billion	\$4.6 billion	\$6.1 billion
Roads and bridges capital	\$5.2 billion	\$1.5 billion	\$3.3 billion	\$5.6 billion
Freight access	<i>Not evaluated</i>	\$156 million	\$248 million	\$448 million
Active transportation	\$2.1 billion	\$770 million	\$1.8 billion	\$3 billion
Technology – system management	\$219 million	\$71 million	\$189 million	\$308 million
Information – travel options	\$197 million	\$51 million	\$127 million	\$216 million
RTP Operations and Maintenance Costs	Climate Smart Strategy 2010-2035	 C10 2018–2027	 C 2040 2018–2040	 S 2040 2018–2040
Transit operations and maintenance	\$8.5 billion	\$5.7 billion	\$13.7 billion	\$16.7 billion
Roads and throughways operations and maintenance	\$12.8 billion	\$6 billion	\$13 billion	\$13 billion
Total estimated cost (2016\$)	\$38 billion	\$19 billion	\$42 billion	\$52 billion

2018 Regional Transportation Plan



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2018 Regional Transportation Plan

Chapter 7

Measuring Outcomes

June 29, 2018

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7.1 INTRODUCTION

Cities and regions around the country are facing important choices about how and where they want to grow and invest in their communities. Faced with limited funding and significant infrastructure needs, the desire for getting the most out of our transportation investments has increased. Performance-based planning has emerged over the past decade as an effective way to understand the consequences and benefits of the choices facing regions. Performance measurement is a way to build accountability and transparency into the transportation planning and decision-making process.

Why performance evaluation matters

The greater Portland region's economic prosperity and quality of life depend on a transportation system that provides every person and business with access to safe, reliable, affordable and healthy travel options.

The Regional Transportation Plan (RTP) purposefully lays out a vision and supporting goals, objectives, performance measures (and targets) and policies that guide transportation planning and decision-making in the region to achieve desired outcomes. Evaluation of the planned regional transportation system projects and programs against a set of outcomes-focused performance measures and targets provides valuable information to the public and decision-makers, including:

- Measurement of how well investment priorities submitted to the Regional Transportation Plan by local agencies, the Oregon Department of Transportation, TriMet, SMART and special districts achieve RTP goals and objectives;
- Improved communication of regional transportation needs and priorities, which is especially important given limited available funding; and
- Increased transparency and accountability throughout the analysis and decision-making process.

When used effectively, performance measures can enable more comprehensive evaluation across multiple issue areas and help communicate tradeoffs and funding decisions to stakeholders. It allows stakeholders and decision-makers to understand whether the region's investment priorities are achieving agreed upon desired outcomes. Applied effectively, performance measurement can be a powerful tool for building public confidence that the available funds are well spent.

7.1.1 Chapter organization

This chapter reports on the expected system performance of the region's investment priorities and documents whether the region achieves regional performance targets in 2040.

7.1. Introduction: This section introduces the chapter.

7.2 Performance-Based Planning and the RTP: This section describes performance-based planning and provides a snapshot of performance outcomes from the evaluation of the RTP projects lists described in Chapter 6.

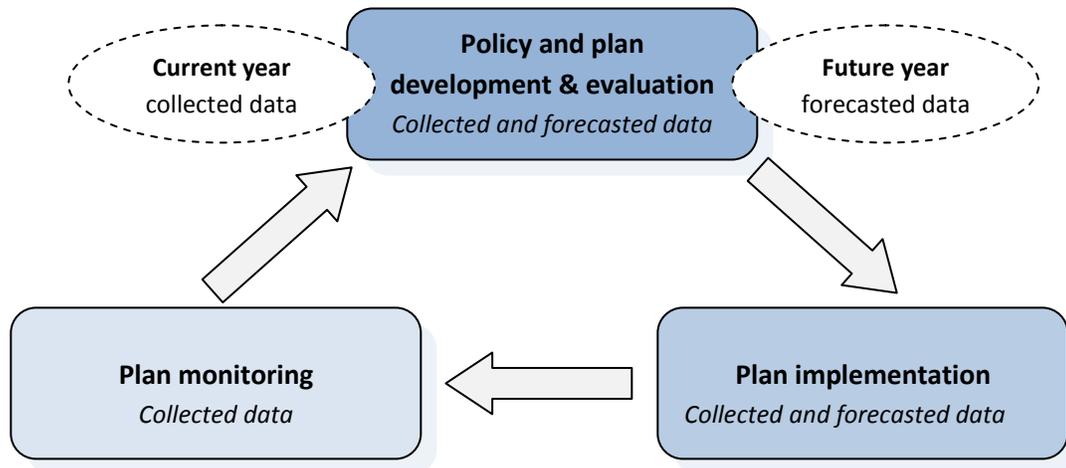
7.3 RTP System Evaluation Framework: This section describes the framework used to conduct the performance evaluation. It describes how transportation equity is measured to understand how disparities are reduced and to meet federal requirements. It describes the different geographical areas that the performance measures are reported on. It describes the investment strategies that were evaluated (the different project lists) and it provides a guide on how to read the performance measure outcomes.

7.4 How the System Performs: This section goes through each of the performance measures for which forecasted data is available and describes the outcomes of each measure.

7.2 PERFORMANCE-BASED PLANNING AND THE RTP

Performance measures serve as the dynamic link between Regional Transportation Plan (RTP) goals and plan implementation. The RTP refers to the cyclical process of plan development, evaluation, plan implementation and monitoring as the Performance Measurement System, as shown in **Figure 7.1**.

Figure 7. 1 Regional Transportation Plan Performance Measurement System



This chapter reports the evaluation of plan performance. Through an evaluation of performance of the transportation system the region can better understand the extent to which investments in the transportation system will achieve desired outcomes and provide the best return on public investments.

This chapter also satisfies performance measures and benchmarks mandated by the Oregon Transportation Planning Rule (TPR), greenhouse gas emissions reduction targets and related monitoring defined in the Metropolitan Greenhouse Gas Reduction Targets Rule and federal requirements to assess potential impacts on environmental resources, historic and cultural resources and tribal lands.

Plan monitoring in support of the region’s federally-required Congestion Management Process reporting between the RTP update cycles is addressed in Chapter 8 and Appendix L. Some of the plan monitoring measures overlap with the performance targets and system evaluation measures, but rely on collected (observed) data rather than forecasted data.

Table 7.1 lists the RTP performance measures used for plan evaluation, linking them to the RTP goals they support.

System evaluation

The RTP is primarily evaluated using **forecasted data** from the travel model, however, outcomes for some performance measures cannot currently be forecasted (affordability and safety) and these measures are not included in the system evaluation. Metro is working with federal, state and local partners to develop tools for future RTP updates that will support evaluating how the plan impacts affordability and safety in the region.

Table 7.1 How RTP System Evaluation Measures Support Meeting RTP Goals

RTP Performance Measures		RTP Goals										
		Vibrant Communities	Shared Prosperity	Transportation Choices	Reliability and Efficiency	Safety and Security	Healthy Environment	Healthy People	Climate Protection	Equitable Transportation	Fiscal Stewardship	Transparency and Accountability
Measures ● = measure highly correlated with achieving goal ◐ = measure somewhat correlated with achieving goal ○ = measure partially supports achieving goal												
How much do households spend on housing and transportation in our region? <i>(Evaluation measures under development for next RTP.)</i>												
n/a	Affordability*	●	●	◐	◐	○	○	●	○	●	There are no system evaluation measures for the Ensure Fiscal Stewardship and Deliver Accountability goals.	
How safe is travel in our region? <i>(Evaluation measures under development for next RTP.)</i>												
n/a	Safety*	●	◐	●	●	●	◐	●	◐	●		
How much do people and goods travel in our region?												
1	Multimodal Travel	●	◐	●	●	◐	●	●	●	●		
2	Active Transportation and Transit Mode Share	●	◐	●	●	◐	●	●	●	●		
How easily, comfortably and directly can we access jobs and destinations in our region?												
3	Access to Travel Options – system completeness *	●	◐	●	●	●	●	●	●	●		
4	Access to Jobs*	●	●	●	○	○	○	◐	◐	●		
5	Access to Community Places*	●	◐	●	○	○	●	●	◐	●		
6	Access to Bicycle and Pedestrian Parkways	●	●	●	○	●	●	●	●	●		
7	Access to Transit	●	●	●	◐	○	●	◐	●	●		
8	Access to Industry and Freight Intermodal Facilities	○	●	○	○	○	○	○	○	○		
How efficient is travel in our region?												
9	Multimodal Travel Times	●	●	●	●	○	○	○	○	○		
10	Congestion	◐	●	○	●	●	◐	◐	◐	○		
11	Transit Efficiency and Ridership	●	○	●	●	○	◐	○	○	○		
How will transportation impact climate change, air quality, the environment and public health?												
12	Climate Change	○	●	●	○	○	●	●	●	○		
13	Clean Air	○	●	●	○	○	●	●	◐	●		
14	Potential habitat Impact	◐	○	○	○	○	●	●	◐	●		
15	Potential historical, cultural and tribal lands impact	●	◐	○	○	○	○	◐	○	○		
16	Public health	◐	◐	○	○	○	●	●	●	○		

Performance measures with an asterix () reflects the transportation priorities identified by historically marginalized communities and serve as the basis for the federally-required Title VI Benefits and Burdens analysis.*

7.2.4 Performance measure outcomes at-a-glance

This section provides a snapshot of the various performance measures used to assess the performance of the RTP – some of the measures are included in the system evaluation in **Section 7.4**, others are not, because there is no method yet to forecast outcomes, but they are reported on here based on observed data.

As a frame of reference for the differences between 2015 and 2040, **Table 7.2 RTP System Evaluation Results Summary** provides a summary of projected changes in demographic, travel and air quality in 2040 within the Metropolitan Planning Area.

Table 7.2 RTP System Evaluation Results Summary

2018 RTP System Evaluation Results Summary

Totals are for travel within the metropolitan planning area for the greater Portland region and assume the 2040 Constrained Projects.

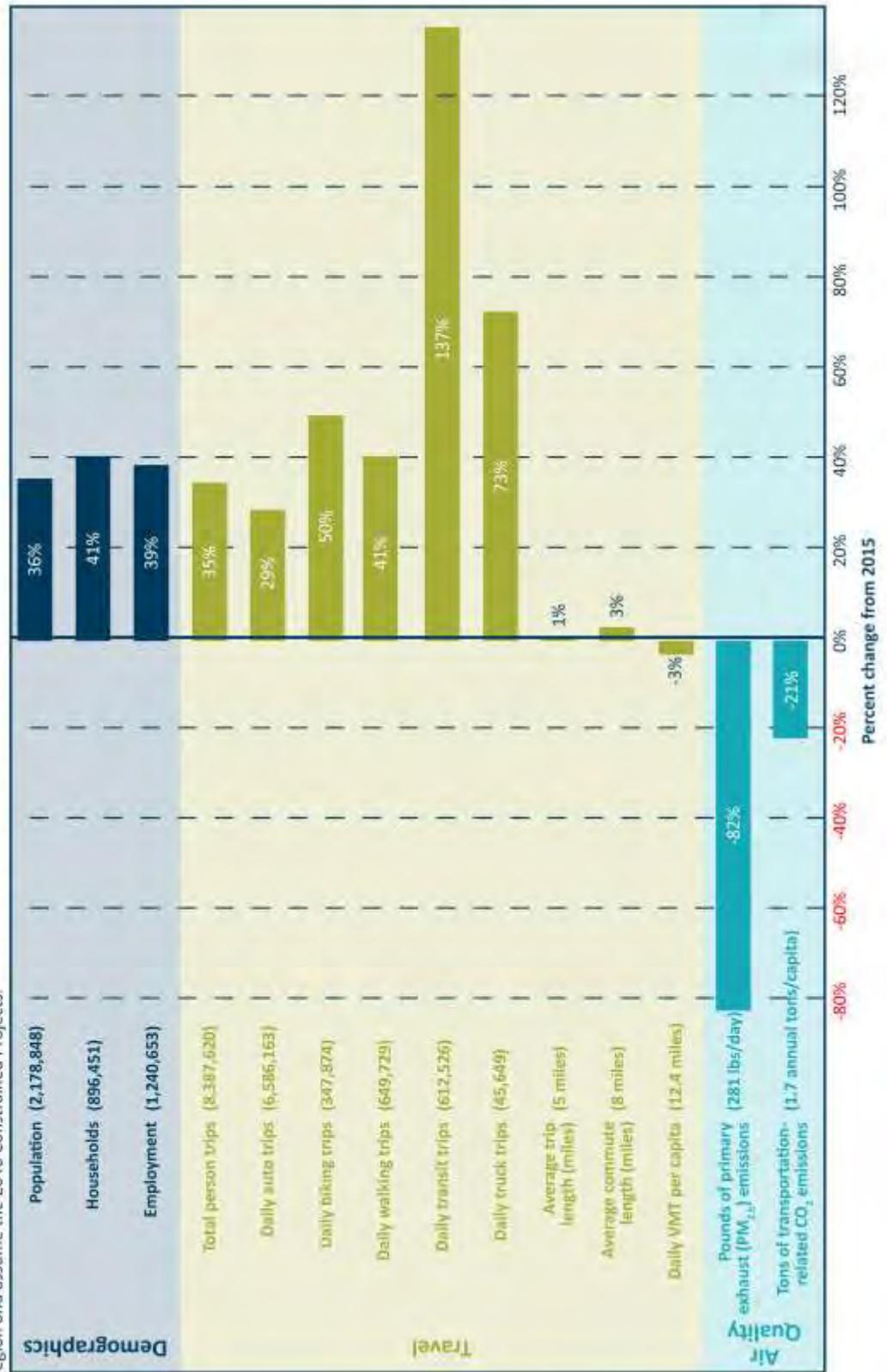


Table 7.3 provides an “at-a-glance” overview of 2018 RTP performance measures and progress made towards targets, or desired direction. Not all performance measures have a performance target. If a performance measure does not have a target, the desired direction is indicated. Performance measures for affordability and safety are included in the system evaluation because the plan does not yet have methods or tools to forecast performance for affordability or safety; therefore, observed data is cited.

Table 7.3 Results of 2018 RTP Target/Direction Assessment for the 2040 Constrained Projects



Plan meets target or desired direction



Plan does not meet target but is moving in the right direction



Plan does not meet target and is moving in the wrong direction

Measure	Target or desired direction	Performance within the metropolitan planning area	Performance in historically marginalized communities	Plan direction
<i>How much do households spend on housing and transportation in our region?</i>				
Affordability	By 2040, reduce the combined housing and transportation expenditure for lower-income households by 25% compared to 2015 combined housing and transportation expenditure levels.	Plan does not forecast affordability or provide system evaluation results. Observed data shows that the region needs to make big strides to reduce disparities in affordability.	Observed data shows that the region needs to make big strides to reduce disparities in affordability for people of color.	Not applicable.
<i>How safe is travel in our region?</i>				
Safety	By 2035 eliminate transportation related fatalities and serious injuries for all users of the region’s transportation system, with a 50% reduction by 2025 and a 16% reduction by 2020 (as compared to the 2015 five year rolling average).	Plan does not forecast safety performance and does not provide system evaluation results. Observed data from the last five years indicates that the region is not moving in the right direction to achieve target.	Annual average fatal and severe injury crashes for all modes increased or remained flat since the 2014 RTP, and are higher for people of color and people with low incomes.	Not applicable.
<i>How much do people and goods travel in our region?</i>				
Multimodal travel	By 2040, reduce vehicle miles traveled per person by 10% compared to 2015.	Plan reduces vehicle miles traveled per person but does not meet target. In 2040, vehicle miles traveled per person decline 5% below 2015 levels.	Not included in transportation equity analysis.	

Measure	Target or desired direction	Performance within the metropolitan planning area	Performance in historically marginalized communities	Plan direction
Active transportation and transit mode share	By 2040, triple walking, biking and transit mode shares compared to 2015 modeled mode shares.	Plan increases walking, biking and transit mode share from 14% to 18% of all trips, but does not meet target.	Not included in transportation equity analysis.	

How easily, comfortably and directly can we access jobs and destinations in our region?

Access to travel options – system completeness	By 2040, complete 100% of the regional network of sidewalks, bikeways, and trails.	Plan makes progress towards meeting the target, but does not reach target of completing 100% of the regional active transportation network. In 2040, 71% of sidewalks, 65% of on-street bikeways, and 47% of regional trails are complete on the regional active transportation network.	Plan makes greater progress towards meeting the target in equity focus areas compared to non-equity focus areas, but does not reach target of completing 100% of the regional active transportation network in equity focus areas.	 Region and equity focus areas
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Access to jobs	No target for this measure. The desired direction is to increase the number of low and middle-wage jobs accessible to the average household in equity focus areas compared to the average household in non-equity focus areas. ¹	Measure is for historically marginalized communities in equity focus areas, see next column.	The average household in an equity focus area sees an increase in the number of jobs, including low and middle wage jobs that can be reached by transit compared to the rest of the region and non-equity focus areas. For other forms of travel (driving, biking, and walking) the increase in the number of jobs the average household in equity focus area can reach is less than what the average household in the region and in non-equity focus areas can reach in a reasonable commute time.	 Region  Equity focus areas
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Access to community places	No target for this measure. The desired direction is to increase to the number of community places accessible to the average household in equity focus areas compared to the average household in non-equity areas. ²	Measure is for historically marginalized communities in equity focus areas, see next column.	The average household in equity focus areas sees a greater increase in the number of community places reached in a short transit trip compared to the average household in the region and non-equity focus areas. The region and non-equity focus areas see a greater increase in the number	 Region 
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¹ Metro will update performance measure with a target and develop evaluation methods to measure the disparities gap in access to low and middle-wage jobs for households in equity focus areas in the next RTP update.

² This measure replaces the 2014 RTP essential destinations target. Metro will update performance measure with a new target and develop evaluation methods to measure the disparities gap in access to community places for households in equity focus areas in the next RTP update.

Measure	Target or desired direction	Performance within the metropolitan planning area	Performance in historically marginalized communities	Plan direction
			of community places reached within a short trip of driving, biking or walking compared to households in equity focus areas.	Equity focus areas
Access to bicycle and pedestrian parkways	No target for this measure. The desired direction is an increase in the number and share of households within a ¼ mile of a bicycle or pedestrian parkway.	Plan increases access to bicycle parkways to 79% of all households in 2040, and decreases access to pedestrian parkways decreases from 86% in 2015 to 85% in 2040.	Not included in transportation equity analysis.	
Access to transit	No target for this measure. The desired direction is an increase in the number and share of households, low-income households and employment near high capacity or frequent transit service by 2040.	Plan achieves desired direction. By 2040, 66% of households are within the desired distance to frequent all day transit; 79% of jobs are within the desired distance to frequent transit.	Plan increases access to transit in equity focus areas by 2027 and 2040.	
Access to industry and freight intermodal facilities	There is no target for this measure. The desired direction is to reduce truck hours of delay on the freight network that provide access to intermodal facilities and industrial lands in 2040.	Plan performance is inconclusive due to limited analysis area in initial performance evaluation. To be updated in final RTP.	Not included in transportation equity analysis.	TBD
How efficient is travel in our region?				
Multimodal travel times	There is no target for this measure. The desired direction is to maintain or reduce travel times for transit, freight, bicycle, and motor vehicle trips.	Plan generally improves or maintains transit, truck and bicycle travel times. Auto travel times increase in most corridors.	Not included in transportation equity analysis.	
Congestion - National Highway System reliable travel	By 2040, increase the TBD% of reliable person-miles traveled on the Interstate System and on the non-Interstate National Highway System.	To be added to final RTP.	Not included in transportation equity analysis.	TBD
Congestion - Vehicle hours of delay per person	By 2040, reduce vehicle hours of delay per person by 10%.	To be added to final RTP.	Not included in transportation equity analysis.	TBD

Measure	Target or desired direction	Performance within the metropolitan planning area	Performance in historically marginalized communities	Plan direction
Congestion - Interim Regional Mobility Policy	By 2040, meet the Interim Regional Mobility Policy for level of service on locations of throughways, arterials, and regional freight network facilities. ³	Plan does not meet policy in all locations.	Not included in transportation equity analysis.	
Congestion - Freight delay	By 2040, reduce vehicle hours of delay per truck trip by 10% compared to 2015.	Plan does not meet target. Truck delay increases 358% by 2040, but this a third less delay than if the plan is not implemented.	Not included in transportation equity analysis.	
Congestion - Total cost of delay on freight network	There is no target for this measure. The desired direction is to reduce growth in cost of delay (in constant dollars) on the regional freight network compared to the 2040 No Build strategies.	Plan decreases cost of delay 65-70% compared to not implementing the plan by 2040.	Not included in transportation equity analysis.	
Congestion - Freight reliability	By 2040, increase TBD% of Interstate System miles with reliable truck travel times.	To be added to final RTP.	Not included in transportation equity analysis.	TBD
Transit efficiency and ridership	There is no target for this measure. The desired direction is an increase in hours of transit service and ridership.	Plan doubles total boardings and increases hours of transit service 60% by 2040.	Not included in transportation equity analysis.	
How will transportation impact climate change, air quality, the environment and public health?				
Climate change	<p>Meet or exceed Climate Smart monitoring targets to reduce greenhouse gas emissions per capita.⁴</p> <p>Reduce per capita greenhouse gas emissions from cars and small trucks by 20% by 2035 and 25% by 2040, compared to 2005 levels.⁵</p>	Plan meets or exceeds most monitoring targets by 2040. It makes progress towards, but does not meet, targets to complete the active transportation network. Plan includes 9,513 transit service revenue hours, which exceeds the Climate Smart Strategy level of 9,400 hours. By 2040 annual per capita emissions	Not included in transportation equity analysis.	

³ Refer to Chapter 3 of the 2018 RTP for Interim Regional Mobility Target thresholds.

⁴ Refer to Appendix J for Climate Smart Strategy monitoring targets and performance

⁵ Target was set based on GreenSTEP model. Metro uses MOVES model which does not correspond to some of the assumptions/inputs included in GreenSTEP (such as technology advances or transportation system management and operations). Therefore, performance outputs of MOVES are different and cannot be compared to GreenSTEP.

Measure	Target or desired direction	Performance within the metropolitan planning area	Performance in historically marginalized communities	Plan direction
		decrease by 21%. ⁶		
Clean air	By 2040, maintain or reduce air pollution (pounds, tons, grams) from mobile sources compared to 2015.	Plan meets target and reduces the amount of mobile source emissions of all criteria pollutants and air toxics by 2040. Certain pollutants see significant reductions.	Not included in transportation equity analysis.	
Potential habitat impact	There is no target for this measure. The desired direction is to identify projects that overlap with sensitive high value habitats and define potential mitigation strategies.	Plan includes 528 projects overlap or cross regionally identified high value habitats. Mitigation strategies are addressed specifically during the project development phase as part of the environmental and land use review, consultation and permitting processes all construction projects must undergo.	Not included in transportation equity analysis.	
Potential historical and cultural resources and Tribal Lands impact	There is no target for this measure. The desired direction is to identify projects that overlap with historical and cultural resources and tribal lands, and define potential mitigation strategies for historical and cultural resources and avoid tribal lands.	Plan includes 62 projects located within 100 feet of historic properties listed in the National Register. Mitigation strategies are addressed specifically during the project development phase as part of the environmental and land use review, consultation and permitting processes all construction projects must undergo. No tribal lands were identified within or adjacent to the metropolitan planning area.	Not included in transportation equity analysis.	
Public health	There is no target for this measure. The desired direction is to increase lives saved, years lived and avoid health care costs.	Plan decreases premature death and disease and avoids over \$31 million in annual health care costs.	Not included in transportation equity analysis.	

⁶ Output from MOVES model and cannot be accurately assessed against target set by GreenSTEP. Based on predicted outcomes of Climate Smart Strategy monitoring target, Metro predicts that per person greenhouse gas emission reduction targets for autos and small trucks will be achieved by 2040.

7.3 RTP SYSTEM EVALUATION FRAMEWORK

The evaluation element of the Regional Transportation Plan Performance Measurement System (see **Figure 7.1**) applies during periodic plan updates, which occur at least every five years. During plan updates, the region reviews its goals and objectives for the transportation system and develops and refines an investment strategy comprised of infrastructure projects and programs submitted by local agencies, the Oregon Department of Transportation, TriMet, SMART, and special districts.

The Regional Transportation Plan (RTP) development and evaluation has two levels: performance targets and system performance evaluation. As previously described in Chapter 2, RTP performance targets are the highest order evaluation measures in the outcomes-based policy framework. The performance targets set quantifiable goals for the achieving the region’s desired policy outcomes (though not all goals have targets). In comparison, system evaluation measures evaluate changes between current conditions (in 2015) and the set of transportation investments the region has chosen to pursue (the funding investment strategies described below). There is some overlap between the targets and the measures but they serve different functions. The performance targets are listed in Chapter 2.

Figure 7.2 2018 RTP Evaluation Framework



For the 2018 RTP update, Metro conducted two rounds of system evaluations. In the first round Metro provided system evaluation results to the public, regional policymakers and to agencies responsible for developing the project lists. Regional leaders provided policy direction based on the results of the first system evaluation results to refine the project list. Metro issued a second “call for projects” and agencies revised the original project list to better meet near-term regional priorities for safety, equity, travel options, Climate Smart Strategy implementation and congestion. The system evaluation that follows in Section 7.4 reports the results of the updated projects and programs submitted by jurisdictional partners.

7.3.1 Measuring transportation equity

As part of the 2018 RTP, Metro conducted a transportation equity evaluation of the financially constrained 2018 RTP investment strategy. The equity evaluation satisfies federal requirements for Environmental Justice Impact Analysis.

The purpose of the transportation equity evaluation was to look at how well the region’s planned long-range transportation investments performed relative to transportation priorities identified by historically marginalized communities. These identified transportation priorities subsequently shaped transportation-related equity goals, objectives, and performance measures in the Plan.

The transportation equity evaluation takes a system-wide look at the region's long-term investment strategy, to determine whether: 1) progress is being made towards transportation priorities expressed by historically marginalized communities; 2) to determine whether the financially constrained long-range transportation investment strategy, in totality, is disproportionately impacting historically marginalized communities and if mitigation measures are necessary; and 3) continue to learn from the assessment to propose technical refinements for future transportation equity evaluations.

The 2018 RTP transportation equity evaluation worked to incorporate and reflect previous recommendations from the 2014 Civil Right Assessment, other agency strategic direction, federal corrective actions, as well as the latest research and best practices – drawing from national experts, think tanks, engagement, and academic partnerships. These different sources shaped and informed further how to measure equity within the context of the transportation system.

Through engagement with historically marginalized communities, the outcomes historically marginalized communities identified as priorities for the transportation system include (not in order):⁷

- accessibility
- affordability

⁷ Due to capacity constraints and additional resource needs, the affordability system evaluation measure was deferred and recommended for development prior to the 2023 RTP.

- safety
- environmental health

These topic areas were translated into system performance measures, which were guided by the input of a technical work group, comprised of community-based organizations, social justice advocates, public health agencies, and jurisdictional partners. A foundational element of the transportation equity evaluation of the 2018 RTP investment strategy was based on defining equity focus areas, which served as the main geography of comparisons of performance relative to the region and the non-equity focus areas. The equity focus areas identify census tracts where there is a significant residential presence of three historically marginalized demographic groups: people of color, people in poverty/with lower-incomes, and English language learners.

Lastly, as recipient of federal transportation funds, Metro is responsible for successful integration of environmental justice (EJ) and civil rights (Title VI) standards into its transportation program and planning activities. Any program or activity receiving federal financial assistance cannot discriminate against people based on race, color, national origin, age, sex, disability, religion or income status nor prohibit a person from participating in regional activities. The programmatic evaluation of the 2018 RTP investments serves as part of demonstrating the planning of federal investments into the regional transportation system complies with federal non-discriminatory and disproportionate impact regulations.

Further detail about the 2018 RTP transportation equity system evaluation can be found in Appendix E: 2018 RTP Transportation Equity Evaluation.

7.3.2 Evaluating system performance for different geographical areas

Metro evaluated the performance of the transportation system for the following geographical areas: 4-County Region and Metropolitan Planning Area. Within the Metropolitan Planning Area (MPA), some measures were also evaluated in equity focus areas, sub-regions, regional centers and Mobility Corridors.

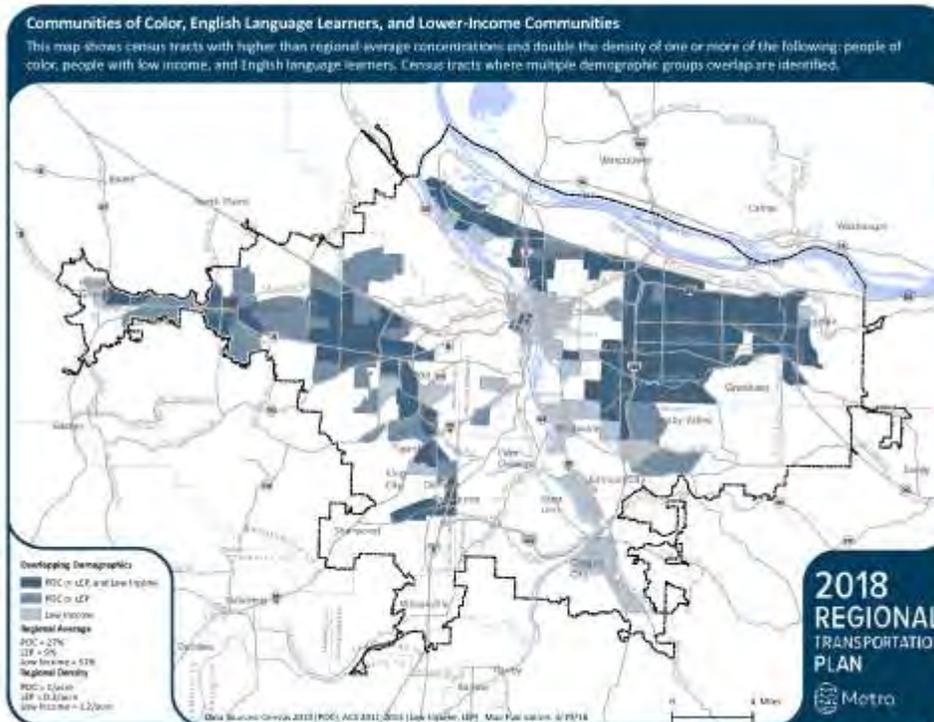


4-County Region

This area includes all of Clackamas, Multnomah, Washington and Clark Counties.

Metropolitan Planning Area Boundary (MPA)

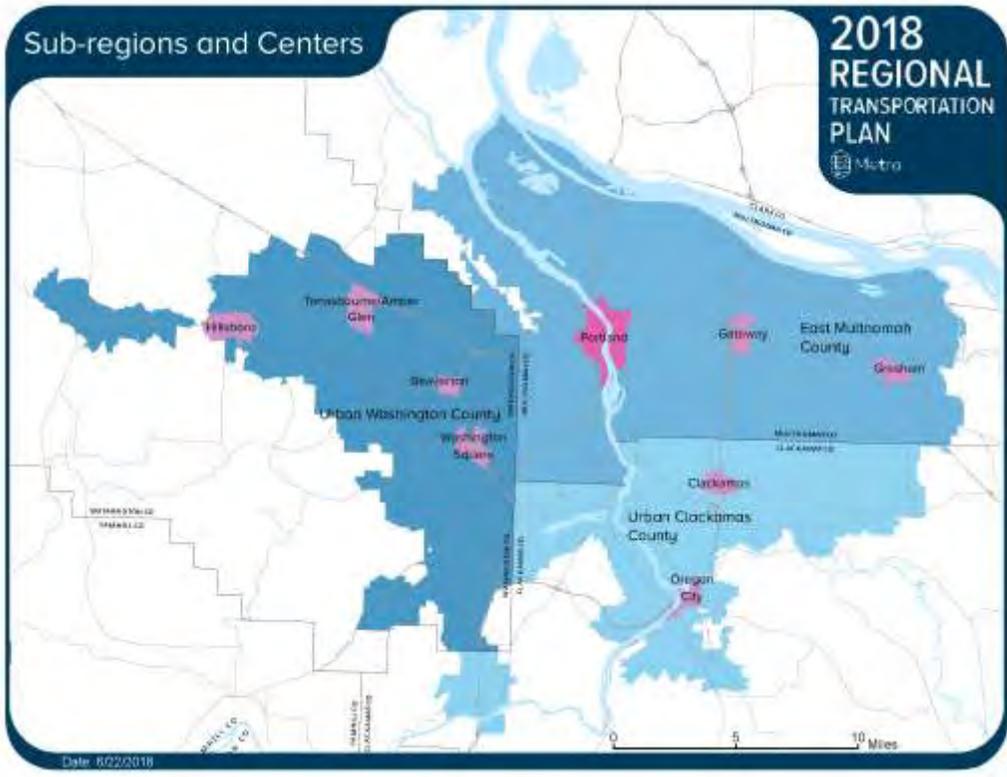
The primary geographic area for the evaluation. Refer to Chapter 1 for a map and definition of the MPA boundary, often referred to as “the greater Portland region.”



Within the MPA some measures were analyzed for sub-geographies:

Equity Focus Areas

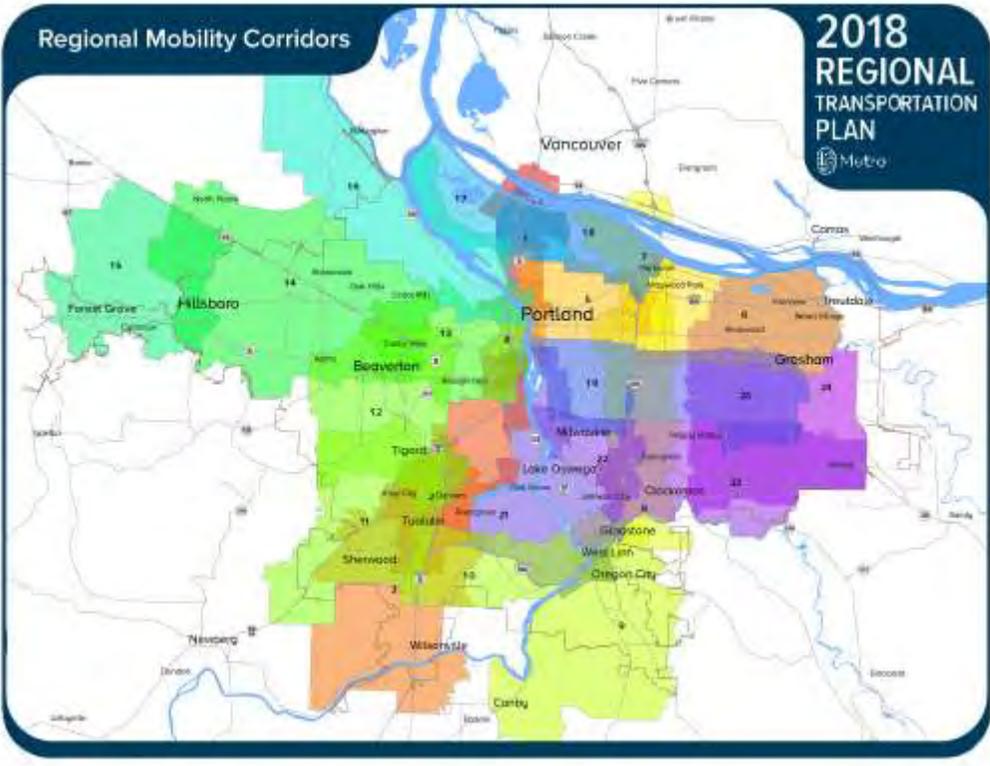
For evaluation measures that included an equity impact analysis the evaluation compares non-equity populations to equity populations. Refer to the Equity Focus Areas maps in Chapter 4.



Within the MPA some measures were analyzed for sub-geographies:

Sub-Regions and Centers

Some evaluation measures include findings for three sub-regions: Portland, Urban Clackamas County, East Multnomah County and Urban Washington County, and for the 2040 Centers.



Within the MPA some measures were analyzed for sub-geographies:

Mobility Corridors

Some evaluation measures include findings by Mobility Corridor.

7.3.3 Evaluating system performance for different investment strategies

Metro evaluated the performance of the transportation system for six different investment strategies. Refer to Chapters 5 and 6 for additional information on the investment strategies and the project lists. Refer to Appendix M for detailed information on the regional travel forecast modeling assumptions for each of the strategies.

- **2015 Base Year** – This is the “existing conditions” strategies against which the other funding assumptions are compared, and uses 2015 population and employment numbers. All transportation projects completed by 2015 are included in the Base Year.
- **2027 No Build** – This strategy assumes only projects with committed funding are built by 2027 and uses 2027 projected population and employment numbers.
- **2027 Constrained** - This strategy assumes that all projects and programs identified in the first ten years of the Regional Transportation Plan are completed by 2027 and uses 2027 projected population and employment numbers.
- **2040 No Build**– This strategy assumes only projects with committed funding are built by 2040 and uses 2040 projected population and employment numbers.
- **2040 Constrained**– This strategy assumes that all projects and programs on the full Constrained list are completed by the year 2040 and uses projected 2040 population and employment numbers.
- **2040 Strategic** – This strategy assumes that all projects on the full Constrained list and all of the projects on the full Strategic list are completed by 2040 and uses projected 2040 population and employment numbers. Funding has not been identified for projects on the Strategic list, and therefore evaluation results are not shown for the Strategic investment strategies in this Chapter. Refer to Appendix I: Performance Evaluation Summary Tables for an overview of system evaluation measure outcomes for the Strategic investment strategies.
- **2035 Climate Smart Strategy** – For purposes of comparison the Climate Smart Strategy is included when data is available. This strategies reflects 2014 RTP constrained projects and programs plus additional transit service and system and demand management investments. This strategy uses projected 2035 population and employment numbers assumed in the 2014 Regional Transportation Plan.

7.3.4 How to read the system evaluation measures

Each system evaluation measure provides the same set of information. **Table 7.X** provides a quick guide on the type of information that is provided for each evolution measure.

Title of Evaluation Measure

Data source: This identifies where the data comes from. The performance measures rely on data generated by the regional travel demand forecast mode (Metro travel forecast model), Metroscope, the regional land use model, and GIS analysis (Metro RLIS) to generate current and future year findings.

Description: This provides a brief description of what the system evaluation measure is and how the data was analyzed. Refer to Appendix X for a complete description of the methodologies.

Target or desired direction: Not every measure has a target; if it does, direction towards achieving the target is described here. If the measure does not have a target, then the desired direction or outcome of the measure (such as increase or decrease).

Findings: This provides a description of what the data evaluation is telling us.

Equity findings: If the evaluation measure evaluated the equity impact those findings are provided here.

7.4 HOW THE SYSTEM PERFORMS

This section describes the findings for each of the following system evaluation measures.

System Evaluation Measures

Affordability –The RTP does not currently have forecast affordability. Evaluation measure(s) and tools will be developed and tested in the next update of the RTP if available.

Safety - The RTP does not currently have forecast crashes. Evaluation measure(s) and tools will be developed and tested in the next update of the RTP if available.

1. **Multimodal travel**
2. **Active transportation and transit mode share**
3. **Access to travel options – system completeness**
4. **Access to jobs**
5. **Access to community places**
6. **Access to bicycle and pedestrian parkways**
7. **Access to transit**
8. **Access to industry and freight intermodal facilities**
9. **Multimodal travel times**
10. **Congestion**
11. **Transit efficiency and ridership**
12. **Climate change**
13. **Clean air**
14. **Potential habitat impact**
15. **Potential historic and cultural resources and tribal lands impact**

7.4.1 Multimodal travel

Data source: Metro travel forecast model

Description: System-wide # of miles traveled (total and share of overall travel) within the Metropolitan Planning Area Boundary (MPA)

- Person miles traveled (*total and per capita*)
- Vehicle miles traveled (VMT) (*total, per capita, per employee*)
- Transit miles traveled (*total, per capita, per employee*)
- Bicycle miles traveled (*total, per capita, per employee*)
- Pedestrian miles traveled (*total, per capita, per employee*)
- Freight miles traveled (*total*)

Target or desired direction: By 2040, reduce vehicle miles traveled per person by 10% compared to 2015.

Findings: Overall travel (person miles traveled – all modes) per capita is increasing in future strategies while vehicle miles traveled per capita decreases over 5 percent between 2015 and the 2040 Constrained strategies – making progress towards the target but not reaching it. That means that other modes such as transit and bicycling are increasing. In the 2040 Constrained strategies transit miles traveled per person increases by 82 percent from 1.1 to 2.0, and bicycle miles travel per person increases by 20 percent, from 0.50 to 0.60 between 2015 and 2040. Miles traveled by any mode are higher per employee than per capita.

Equity findings: Not included in transportation equity analysis.

Figure 7.3 Vehicle miles traveled per person each day

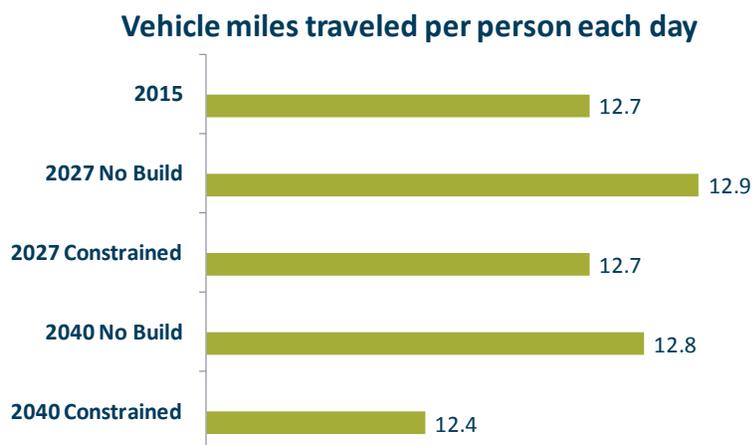


Table 7.4 Daily person miles traveled per person

Person Miles Traveled	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Total	30,403,023	36,272,364	36,639,935	41,359,645	30,403,023	N/A
Per Person	18.9	19.0	19.2	19.0	19.3	

Table 7.5 Daily vehicle miles traveled per person

Vehicle Miles Traveled	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Total VMT	20,798,618	24,534,300	24,128,244	27,879,927	27,080,813	N/A
Per person	12.7	12.9	12.7	12.8	12.4	
Per employee	23	23	23	23	22	

Table 7.6 Daily transit miles traveled per person

Transit Miles Traveled	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Total	1,814,208	2,537,005	3,212,334	3,033,836	4,449,821	N/A
Per person	1.1	1.3	1.7	1.4	2.0	
Per employee	2.0	2.4	3.0	2.4	3.6	

Table 7.7 Daily bicycle miles traveled per person

Bicycle Miles Traveled	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Total	750,707	970,434	997,531	1,198,724	1,231,182	N/A
Per person	0.5	0.5	0.5	0.6	0.6	
Per employee	0.8	0.9	0.9	1.0	1.0	

Table 7.8 Daily pedestrian miles traveled per person

Pedestrian Miles Traveled	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Total	262,288	311,833	317,059	362,741	371,304	N/A
Per person	0.2	0.2	0.2	0.2	0.2	
Per employee	0.3	0.3	0.3	0.3	0.3	

Table 7.9 Daily freight truck miles traveled

Freight Miles Traveled	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Total	361,770	501,027	500,799	651,897	651,127	N/A

7.4.2 Active transportation and transit mode share

Data source: Metro travel forecast model

Description: Evaluates percent of non-driving trips (daily walking, bicycling, and transit trips) at multiple levels (system wide, sub region, mobility corridor, central city and al centers). The data is categorized by 'trips within' and 'all trips'. 'Trips within' encompasses

all trips that occur within the center or subarea. ‘All trips’ encompasses trips to, from and within the center, sub region or corridor.

Target or desired direction: Increase non-driving mode share at all geographic levels. Triple walking, biking and transit region wide by 2040 compared to 2015 levels.

Findings: Findings for mode share are provided below for sub regions, centers, and mobility corridors.

Equity findings: Not included in transportation equity analysis

System wide (within MPA boundary)

Plan does not meet target of tripling walking, biking and transit region wide (within the MPA) between 2015 and 2040.

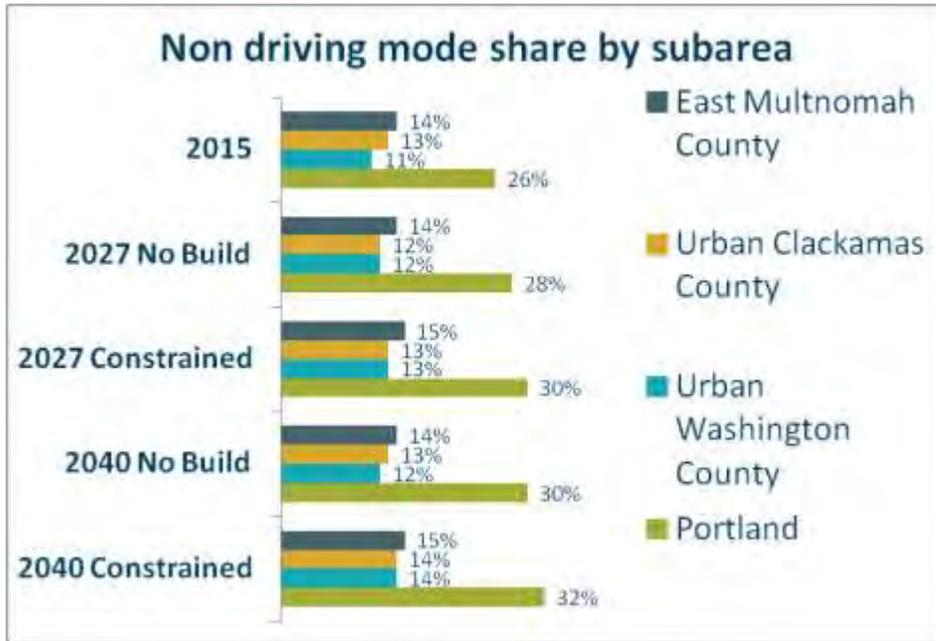
Table 7.10 Active transportation mode share within the MPA

Active transportation mode share	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Walk	7.4%	7.4%	7.6%	7.5%	7.7%	N/A
Bike	3.7%	3.9%	4.0%	4.1%	4.1%	
Transit	4.2%	4.9%	6.1%	5.2%	7.3%	

Sub-regions

As the figure below shows, there are relatively large increase from 2015 to 2040 Constrained for travel within the City of Portland (from 26 percent to 32 percent) and urban Washington County (11 percent to 14 percent), with more moderate increases within other sub regions. However, non-driving modes do not triple.

Figure 7.4 Non driving mode share by sub-region



Centers

Centers across the region display relatively large increases in non-driving mode share (transit, biking and walking) between 2015 and 2040. Note - “All trips” includes all travel to, from, or within the center. This measure addresses the Transportation Planning Rule’s requirement to lower drive alone mode share within centers.

Table 7.11 Non driving mode share within regional 2040 centers

Centers Non Driving mode share	2015 Base Year		2027 No Build		2027 Constrained		2040 No Build		2040 Constrained	
	Trips Within	All Trips	Trips Within	All Trips	Trips Within	All Trips	Trips Within	All Trips	Trips Within	All Trips
Portland central city	65%	38%	71%	44%	73%	48%	74%	47%	78%	54%
Amberglen regional center	40%	12%	41%	13%	44%	15%	41%	14%	48%	19%
Beaverton regional center	40%	12%	41%	13%	44%	16%	42%	13%	46%	18%
Clackamas regional center	33%	11%	34%	12%	39%	15%	35%	13%	43%	17%
Gateway regional center	37%	13%	38%	15%	41%	17%	39%	16%	43%	20%

Centers Non Driving mode share	2015 Base Year		2027 No Build		2027 Constrained		2040 No Build		2040 Constrained	
	Trips Within	All Trips	Trips Within	All Trips	Trips Within	All Trips	Trips Within	All Trips	Trips Within	All Trips
Gresham regional center	31%	13%	32%	13%	35%	16%	33%	13%	38%	17%
Hillsboro regional center	47%	18%	49%	19%	52%	22%	49%	19%	55%	24%
Oregon City regional center	25%	7%	26%	7%	28%	8%	28%	7%	30%	10%
Vancouver, WA central business district	43%	15%	48%	18%	50%	18%	50%	19%	53%	22%
Washington Square regional center	29%	9%	31%	10%	35%	12%	32%	10%	39%	14%

Mobility Corridors

Non-driving increases in most mobility corridors across the region. A corridor that shows an especially large increase is Corridor 2 - Portland to Tigard/Tualatin which increases from 15 percent to 21 percent (for trips within corridor) between the 2040 No Build and 2040 Constrained. This is likely due to the major investment in the SW Corridor High-Capacity Transit and associated projects. See Appendix I – Performance Evaluation Summary Tables for results for all mobility corridors.

7.4.3 Access to travel options – system completeness

Data source: State and local agency Geographic Information System (GIS) data for sidewalk, bikeway, regional trail and street projects. Regional Land Inventory System (RLIS) GIS data of existing (constructed) sidewalks, bikeways, trails, and streets. Regional Transportation Plan GIS data of the planned pedestrian, bicycle, transit and roadway networks.

Description: Evaluates completeness of sidewalks, bikeways, regional trails and roadways.

- Access to transit – Sidewalks, bikeways, regional trails and new streets completed within ½ mile from light rail stops, 1/3 mile from street car stops, and ¼ mile from bus stops; existing and planned stops.

- Sidewalks - miles completed and percent complete on the Regional Pedestrian Network (refer to map in Chapter 3); within 2040 centers, on existing arterial roadways, and in equity focus areas.
- Bikeways (on-street) - miles completed and percent complete on the Regional Bicycle Network (refer to map in Chapter 3); within 2040 centers, on existing arterial roadways, and in equity focus areas.
- Trails (regional) - miles completed and percent complete on the Regional Bicycle and Pedestrian Networks (refer to maps in Chapter 3), and in equity focus areas.
- New Streets - miles completed and percent complete on the Regional Motor Vehicle Network (refer to map in Chapter 3); within 2040 centers, and in equity focus areas.

Target or desired direction:

- Hundred percent completion of the regional pedestrian and bicycle networks by 2040.
- Completion of new street projects in the 2018 Regional Transportation Plan project list.
- Increase completion of sidewalks, bikeways and trails near transit to increase access.

Findings: See below. Findings for equity focus areas are provided at the end.

Access to transit

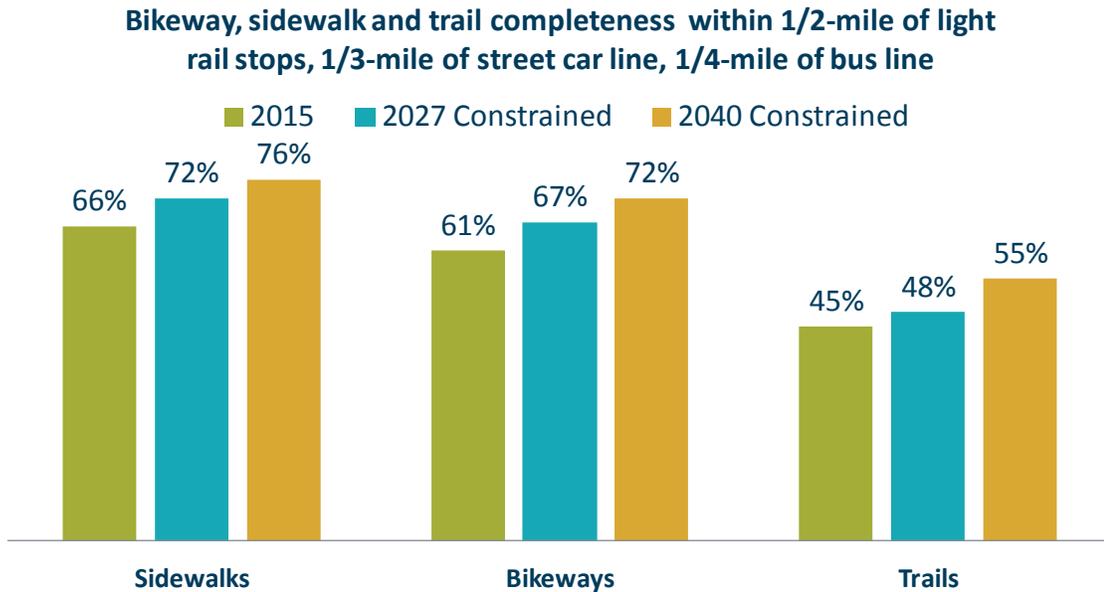
While progress is made in filling gaps in sidewalks, bikeways and trails to access transit, not all gaps are filled. By 2040, 76 percent of sidewalks are completed, 72 percent of all bikeways are completed and 55 percent of regional trails are completed within ½-mile from light rail stops, 1/3-mile from street car stops, and ¼-mile from bus stops.

Greater progress is made in increasing access to transit compared to region-wide. For example, while 76 percent of sidewalks are completed near transit, only 62 percent of sidewalks on arterial roadways are completed. This indicates that policies prioritizing access to transit are working.

Table 7.12 Access to travel options – access to transit

Access to transit	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Percent sidewalks completed within ½ mile from light rail stops, 1/3 mile from street car stops, and ¼ mile from bus stops	66%	66%	72%	66%	76%	Not evaluated
Within equity focus areas	74%	74%	81%	74%	85%	Not evaluated
Percent bikeways completed within ½ mile from light rail stops, 1/3 mile from street car stops, and ¼ mile from bus stops	61%	61%	67%	61%	72%	Not evaluated
Within equity focus areas	64%	64%	71%	64%	76%	Not evaluated
Percent trails completed within ½ mile from light rail stops, 1/3 mile from street car stops, and ¼ mile from bus stops	45%	45%	48%	45%	55%	Not evaluated
Within equity focus areas	44%	44%	49%	44%	55%	Not evaluated

Figure 7. 5 Access to transit



Sidewalk completeness

While progress is made, the target of completing 100 percent of the regional pedestrian sidewalk network is not met. Seventy-one percent of sidewalks on the regional pedestrian network are completed in 2040 in the plan.

Additionally, the plan makes progress towards completing sidewalks in 2040 centers and on arterial roadways, but does not all gaps are filled.

By 2040, the plan completes 51 percent sidewalks within 2040 centers.

By 2040, the plan completes 62 percent of sidewalks on arterial roadways in the region (481 miles out of 773 miles).

Table 7.13 Access to travel options – sidewalk completeness

Sidewalk completeness	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Miles complete:	477	477	529	477	565	Not evaluated
Percent complete:	60%	60%	66%	66%	71%	
Planned network						
Miles complete:	300	300	330	300	350	Not evaluated
Percent complete:	71%	71%	78%	71%	82%	
Planned network within equity focus areas						
Miles complete:	772	772	797	772	822	Not evaluated
Percent complete:	48%	48%	49%	48%	51%	
Centers						
Miles complete:	578	578	596	578	614	Not evaluated
Percent complete:	55%	55%	56%	55%	58%	
Centers within equity focus areas						
Miles complete:	394	394	445	394	481	Not evaluated
Percent complete:	51%	51%	58%	51%	62%	
Arterial roadways						
Miles complete:	250	250	280	250	296	Not evaluated
Percent complete:	67%	67%	75%	67%	79%	
Arterials within equity focus areas						

Figure 7.6 Percent of sidewalks completed on the planned regional pedestrian network

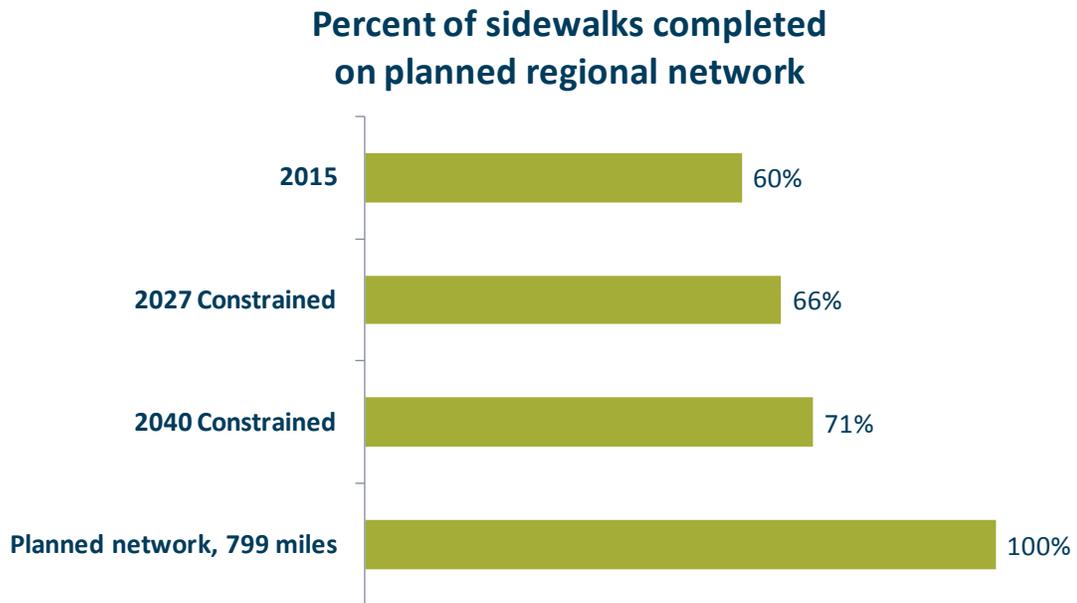
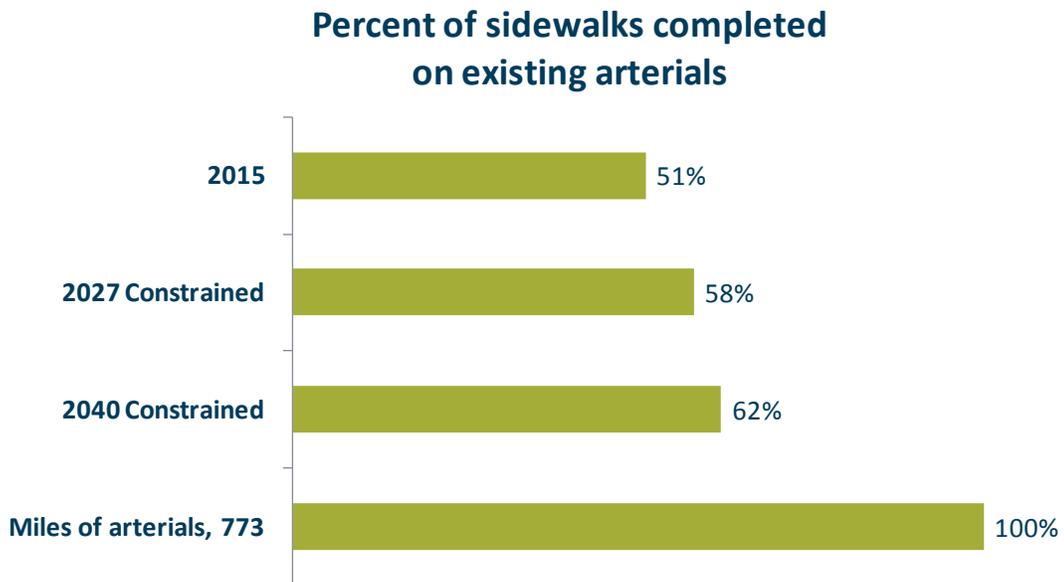


Figure 7.7 Percent of sidewalks completed on existing arterial roadways



Bikeway (on-street) completeness

While some progress is made, the target of completing 100 percent of the regional pedestrian sidewalk network is not met. By 2040, the plan completes 65 percent of the planned regional bikeway network (644 out of 997 miles).

Additionally, the plan makes progress towards completing bikeways in 2040 centers and on arterial roadways, but not all gaps are filled.

By 2040, the plan completes 30 percent of bikeways within 2040 centers.

By 2040, the plan completes 48 percent of bikeways on arterial roadways in the region.

Table 7.14 Access to travel options – bikeway completeness

Bikeway (on-street) completeness	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Miles complete:	538	538	598	538	644	421
Percent complete:	54%	54%	60%	54%	65%	93%
Planned network						
Miles complete:	295	295	332	295	355	Not evaluated
Percent complete:	60%	60%	68%	60%	78%	evaluated
Planned network within equity focus areas						
Miles complete:	433	433	462	433	487	Not evaluated
Percent complete:	27%	27%	28%	27%	30%	evaluated
Centers						
Miles complete:	320	320	345	320	361	Not evaluated
Percent complete:	30%	30%	33%	30%	34%	evaluated
Centers within equity focus areas						
Miles complete:	280	280	331	280	372	Not evaluated
Percent complete:	36%	36%	43%	36%	48%	evaluated
Arterial roadways						
Miles complete:	164	164	196	164	213	Not evaluated
Percent complete:	44%	44%	52%	44%	57%	evaluated
Arterials within equity focus areas						

Figure 7.8 Percent of bikeways completed on the planned regional bike network

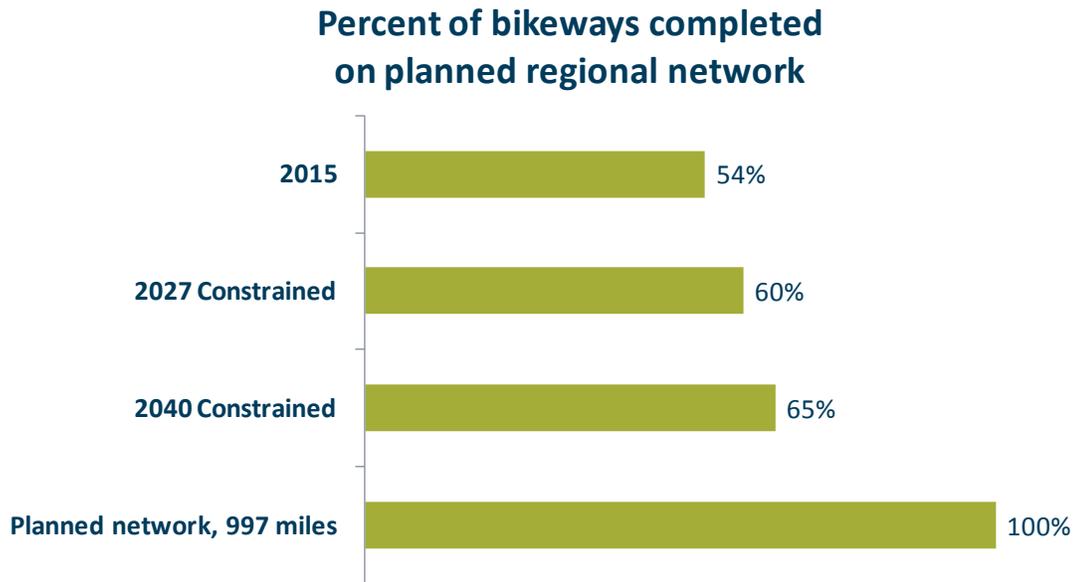
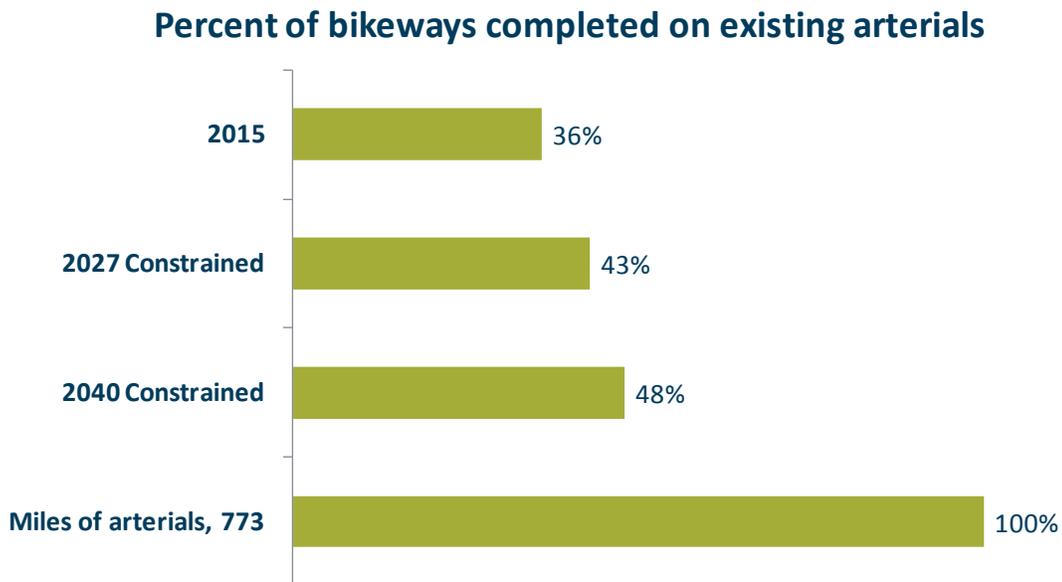


Figure 7.9 Percent of bikeways completed on existing arterial roadways



Trails (regional) completeness

While some progress is made, the target of completing 100 percent of the trail network is not met. By 2040, the plan completes 47 percent of the planned regional trail network that is identified on the regional pedestrian and bicycle networks (241 out of 525 miles).

Table 7.15 Access to travel options – regional trail completeness

Regional trail completeness	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Miles complete	185	185	202	185	241	369
Percent complete:	36%	36%	40%	36%	47%	70%
Planned network						
Within equity focus areas	68 39%	68 39%	77 44%	68 39%	85 49%	Not evaluated

Percent of regional trails completed on planned regional network



New streets completeness

Note: This section and table to be completed in the final RTP once the Motor Vehicle planned system map has been updated.

Table 7.16 Access to travel options – new street completeness

New streets completeness	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Miles complete:						
Percent complete:						
Planned network						
Miles complete:						
Percent complete:						

Centers

Within equity focus areas

Equity findings: Equity focus areas see a higher rate of active transportation (i.e. sidewalk, on-street bikeway, off-street bikeway, and trail completion) compared to the overall completion rate for the region and in non-equity focus areas. In general, completion rates for planned miles of sidewalks, bicycle paths, and trails exceed region and non-equity areas 1 percent - 3 percent. When looking more closely at specific facilities, such as arterials, a slightly greater rate active transportation system completion in equity focus areas is planned compared to the overall regional active transportation network. Arterials see between 12 percent-14 percent increase in miles of sidewalk and on street bicycle completion, which is slightly greater than the region overall at 12 percent-13 percent as well as near transit and in 2040 centers. The results illustrate that in the refinement phase, partners placed further focus to complete the active transportation network in equity focus areas while also balancing considerations like urban arterial facility and in proximity to a transit stop.

Furthermore, what is also observed is that greater rates of completion are in equity focus areas within the first 10-years (2018-2027) of the 2018 RTP investment strategy. In general, a greater proportion of the active transportation investment relative to other types of transportation investment is in the first 10-years of the plan (28.8 percent of 2018-2027 investment; 14.9 percent of 2028-2040 financially constrained). Then when looking at completion rate of the on-street bicycle network in equity focus areas by 2040, the increase is 12 percent, and the first 8 percent of that growth in miles of completed on-street bicycle network is slated between 2018-2027. The remaining 4 percent growth in miles of on-street bicycle network is set for the outer years of the investment strategy. This is a change from what was observed in the first round of performance evaluation of the 2018 RTP where more active transportation investments were planned for the outer years. Jurisdictional partners responded to leadership direction to advance and further complete the active transportation network in the first 10-years of the 2018 RTP. The one area where this statistic diverges slightly is with regional trails, where a steady rate (6 percent) of completion is observed in the first 10-years and the out part (2028-2040) of the plan.

Nonetheless, the active transportation network does not see 100 percent completion in any category. Sidewalk completion, with the highest rate of completion, tops out at 83 percent in communities of color and communities with limited English proficiency region wide. When looking further, sidewalk completion in proximity to transit stops (e.g. bus, streetcar, or light rail) see 86 percent (with the 2040 financially constrained investment strategy) through 87 percent (with the 2040 strategic investment strategy) completion. The overall 2018 RTP investment level in active transportation ranges between \$1.84 billion (in the 2040 financially constrained) to \$2.98 billion (in the 2040 strategic). This

range makes up between 10.7 percent – 12.4 percent of the overall 2018 RTP investment strategy. While falling short of the region’s target to complete the active transportation network, the focus on advancing active transportation projects in the first ten years of the Plan and placing active transportation investments in equity focus areas at a greater levels than the non-equity focus areas indicate there is not an disproportionate or disparate impact.

Figure 7.10 Percent sidewalks completed on planned network in equity focus areas

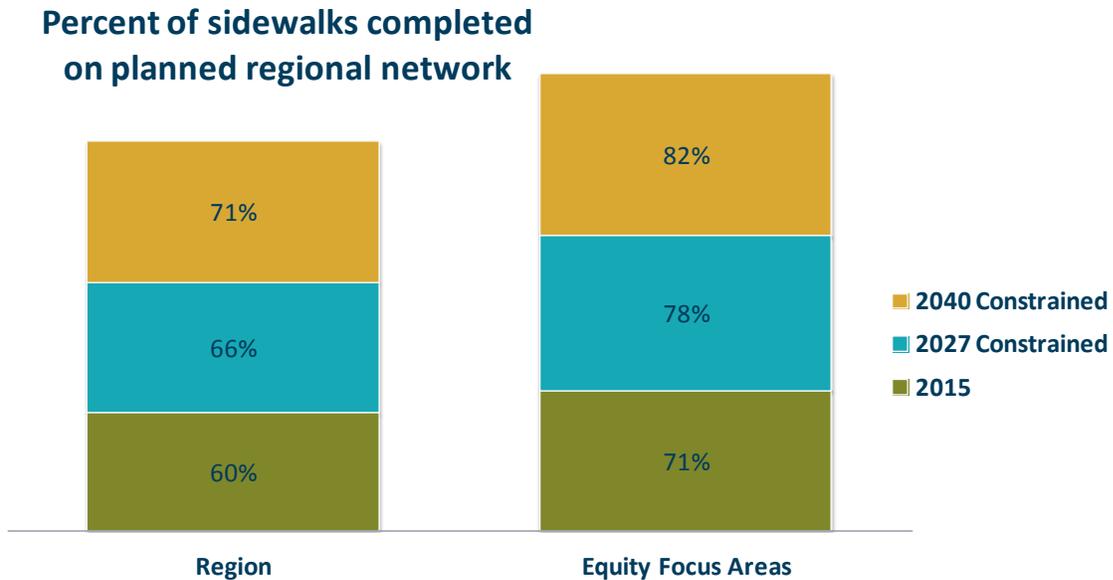
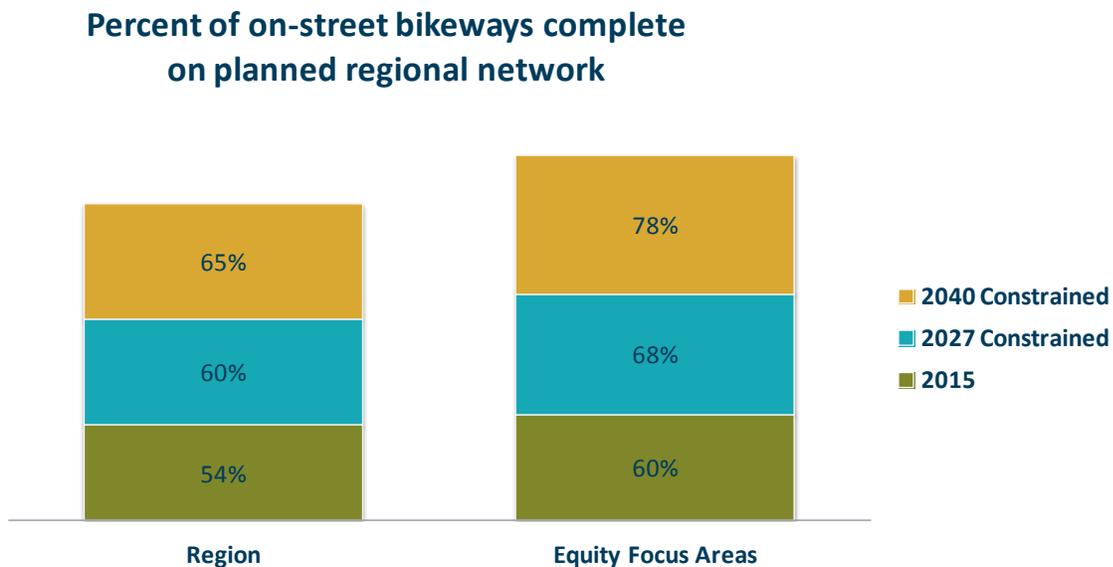


Figure 7.11 Percent bikeways completed on planned network in equity focus areas



7.4.4 Access to jobs

Data source: Geospatial project information for proposed transportation projects provided by project sponsors and forecasted employment/jobs from MetroScope. Projections of jobs and geographic distribution of employment is based on underlying U.S. Bureau of Labor Statistics data (Quarterly Census of Employment and Wages) and assumptions regarding growth for the employment industries in MetroScope, and Metro travel forecast model

Description: Number and percent change of jobs (classified by wage groups – low, middle, and high) accessible by driving, transit, bicycling, and walking - region-wide, in equity focus areas (people of color, English language learners and lower income), and in non-equity focus areas within the following commute times:

- 30 minutes by auto*
- 45 minutes by transit*
- 30 minutes by bike
- 20 minutes by walking

*Includes access and egress times.

Target or desired direction: No target. Desired direction is to increase the number of jobs accessible to the average household within a reasonable commute, with a focus on increasing middle and low-wage job access for the average household in equity focus areas compared to non-equity focus areas and the region by 2040.

Per recommendation by the transportation equity work group, Metro will update performance measure with a target and develop evaluation methods to measure the disparities gap in access to low and middle-wage jobs for households in equity focus areas for the next update of the RTP.

Findings: In general, the 2018 RTP investment strategy increases the number of jobs the average household can reach within a commute time adjusted by travel mode. With the first ten years of investment outlined in the 2027 Constrained investment strategy, the average household will see a range of 18 more jobs by walking to 21,000 more jobs by transit accessible due to the investment strategy. (See Table 7.17) The additional number of jobs accessible means the average household in the region is able to reach upwards of 49percent of all the jobs in the region within a typical commute time, depending on the form of travel. Interesting to note is that the average household is able to reach approximately 10percent of the region's 1 million projected jobs by either transit, during the rush hour, or by bicycle within their respective commuting times (45 minutes for transit, 30 minutes for bicycling). By far, the investment in transit in the 2040 Constrained investment strategy show larger gains in the number of jobs accessible, where nearly 25 percent more jobs become accessible to the average household within a 45 minute transit trip. Comparatively, driving and biking saw closer to .8percent (biking) to 1.6percent (driving) increased job access in the typical 30 minute commute time. This illustrates the

multimodal investments in the 2027 Constrained investment strategy is making a positive impact in increasing the number of jobs accessible across different forms of travel, giving households more options for commuting to work.

While the 2027 Constrained investment strategy see increases in the number of jobs accessible, the additional investment slated for 2028 through 2040 in the full 2040 Constrained investment strategy only further increases the number of jobs the average household can reach within a typical commute time. For driving, transit, and walking, the increase in the number of jobs at a minimum doubles with some cases the increase being 3 or 4 times greater than the gains seen within the first ten years. The one exception is bicycling, where a decrease in the number of jobs accessible within a 30 minute bicycle ride is projected. The decrease may be due to the greater number of route and facilities options available for bicycle commutes and as a result creating further out of direction travel or longer than 30 minute bicycle commute trips. In general the average household will see a range 70 more jobs by walking to over 40,000 more jobs by transit, accessible due to the long-range investment strategy. Similar to the first 10 years, transit will see the greatest increase in the number of jobs accessible within a 45 minute transit commute at upwards of 42 percent more jobs.

Table 7.17 Change in the Number of Jobs Accessible Within a Typical Commute Time (adjusted by form of travel) in the 2027 Constrained Investment Strategy

Change in Total Number of Jobs Accessible in 2027 Constrained compared to 2027 No Build						
	Auto Rush Hour	Auto Non Rush Hour	Transit Rush Hour	Transit Non Rush Hour	Bike	Walk
All Jobs	15,169	8,460	21,448	19,371	907	18
Low Wage Jobs	7,194	4,040	10,197	9,192	411	9
Middle Wage Jobs	4,168	2,318	5,883	5,322	258	5
High Wage Jobs	3,807	2,102	5,368	4,857	239	4
Change in Total Number of Jobs Accessible in 2040 Constrained compared to 2040 No Build						
	Auto Rush Hour	Auto Non Rush Hour	Transit Rush Hour	Transit Non Rush Hour	Bike	Walk
All Jobs	36,268	37,062	40,694	40,185	-509	70
Low Wage Jobs	17,118	17,512	18,671	18,452	-255	32
Middle Wage Jobs	10,017	10,223	10,929	10,829	-131	20
High Wage Jobs	9,165	9,362	10,065	9,960	-122	18

Table 7.18 Change in the Number of Jobs Accessible, by Wage Profile, Within a Typical Commute Time for Different Communities (adjusted by form of travel)

Change in Total Number of Jobs Accessible in 2027 Constrained compared to 2027						
No Build						
All Jobs						
	Auto Rush Hour	Auto Non Rush Hour	Transit Rush Hour	Transit Non Rush Hour	Bike	Walk
Region	15,169	8,460	21,448	19,371	907	18
Equity Focus Areas	13,210	7,534	24,155	21,549	365	11
Non-Equity Focus Areas	16,694	9,087	17,157	15,797	1,467	25
Low Wage Jobs						
	Auto Rush Hour	Auto Non Rush Hour	Transit Rush Hour	Transit Non Rush Hour	Bike	Walk
Region	7,194	4,040	10,197	9,192	411	9
Equity Focus Areas	6,277	3,595	11,502	10,235	162	5
Non-Equity Focus Areas	7,906	4,343	8,138	7,486	667	13
Middle Wage Jobs						
	Auto Rush Hour	Auto Non Rush Hour	Transit Rush Hour	Transit Non Rush Hour	Bike	Walk
Region	4,168	2,318	5,883	5,322	258	5
Equity Focus Areas	3,621	2,067	6,622	5,919	103	3
Non-Equity Focus Areas	4,596	2,488	4,711	4,341	417	6

Equity findings: For the average household within an equity focus area, the number of jobs accessible within a typical commute time by different forms of travel is expected to increase. The average household in an equity focus area will see upwards of 11 more jobs within a 20-minute walk to over 24,000 more jobs in a 45 minute transit trip due to the investment strategy with the 2018 RTP investment strategy through 2027. With the addition of the 2018 RTP investment strategy beyond 2027 to 2040, the increase in the number of jobs accessible for the average household in equity focus areas goes up to 65 more jobs within a 20-minute walk to over 44,000 more jobs in a 45-minute transit trip. When looking more specifically at low-wage and middle-wage jobs, as a result of the 2018 RTP investment strategy the average household in equity focus areas see the number of

middle and low wage jobs accessible in a 45-minute transit commute increase 42 percent by 2040.

The positive take away from the 2018 RTP investment strategy is there is an increase in the number of jobs accessible to the average household in the equity focus areas within a typical 45-minute transit commute trip. This patterns hold true regardless of the time of day (e.g. rush hour travel, where typically more transit service is out on the streets, or non-rush hour travel which is any other time of day). Additionally, what is also seen is with the 2018 RTP investment through 2027, an increase of 21,000 more jobs are accessible in a 45-minute transit commute for the average household in an equity focus area. But by 2040, the additional investment increases the number of jobs accessible within a 45-minute transit commute to over 44,000 for the average household in the equity focus areas. A similar pattern is observed when looking at both low and middle wage jobs. The number of low and middle wage jobs accessible within a 45-minute transit commute for the average household in equity focus areas increases by a little over 10,000 (low wage) and a little under 6,000 (middle wage) in 2027 to just over 21,000 (low wage) and over 12,300 (middle wage) jobs. The result shows the region is focusing transit investments in equity focus areas to support the travel needs of historically marginalized communities.

Nonetheless, in some cases, the average household in the region and the average household in non-equity focus areas see a greater increase in the number of jobs within a typical driving, bicycling or walking commute compared to the equity focus areas. For example, with the 2018 RTP investments through 2027, the non-equity focus areas see an increase of 1,467 more jobs accessible by bicycle in a 30-minute commute, whereas equity focus areas see an increase of 365 more jobs in a 30-minute commute due to the first ten years of investment. This same pattern of non-equity areas seeing an increase in the number of jobs accessible is observed when looking at jobs by their wage profile (low, medium, high) primarily in driving, bicycling, and walking with investment through 2027 and with the investments through 2040 identified in the 2018 RTP.

There are some potential different reasons for why the average household in the region and in non-equity focus areas see a greater increase in the number of jobs accessible within a typical driving, biking, or walking commute, regardless of wage profile of job type. For driving, the issue of traffic congestion may be impacting why equity focus areas may see a lesser increase in the number of jobs accessible within a 30-minute driving commute. Another factor may also be the changing land use mix of the region where the typical commute distance to work is getting longer and therefore resulting in longer travel time. For walking and bicycling, it is possible as more transportation investments build out the active transportation network, specifically in equity focus areas, more active transportation route options become available which are more attractive for riding. From the results of Access to Travel Options performance measure, the region did focus active transportation investments in equity focus areas. The increased number of available route options may encourage people commuting to work to bike a little bit further or slightly out

of direction to access a better bicycling or walking facility. The result is more time spent in active travel, which may be an indirect benefit. Whereas in the non-equity focus area, especially in the less developed areas of the region, a new bicycle facility which may have not existed and without other route options would vastly open up access for commuting. The results may illustrate the swings or a decrease in the number of jobs accessible within a 20-minute walk commute or 30-minute bicycle commute is not a detrimental result because it is impacting travel behavior and choice. More analysis would be needed to fully understand these results.

While it is disappointing to see equity focus areas seeing lesser increases of number of jobs accessible by driving, bicycling, and walking compared to the region overall and non-equity focus areas, one consideration to take into account is that equity focus areas have a greater number of jobs accessible within a typical commute across all forms of travel. For example, in 2027 without the 2018 RTP investment strategy, the average household in equity focus area can reach a little over 107,000 jobs, which is about 10 percent of all the region's jobs by transit in a 45-minute commute. For the non-equity focus areas, the average household can reach a little over 57,000 jobs and the average household in the region can reach a little over 86,000 jobs by transit in the same 45-minute window. This means the region has already been focusing on placing transportation investments in equity focus areas and only trying to further gain more efficiency.

The mixed results demonstrate that more investigation is necessary to understand how to improve and increase the number of jobs accessible in a reasonable commute for the average household in equity focus areas across all forms of travel. While the 2018 RTP investment strategy has determined the successful approach for transit and placing transit service, it is necessary to dig in and understand how to increase the number of jobs accessible by bicycling and walking in particular. This is because historically marginalized communities tend to use transit, bicycling, and walking for more of their travel trips. In addition to further investment, other strategies may be necessary, such as land use strategies, travel options education and demand management. But more analysis is necessary to understand the results further and determine the appropriate set of strategies to make improvements. Additionally, the mixed results indicate further investigation is necessary to determine whether there is a potential disproportionate or disparate impact.

7.4.5 Access to community places

Data source: Geospatial project information for proposed transportation projects from project sponsors; U.S. Bureau of Labor Statistics – Quarterly Census of Employment and Wages (2013) and Select North American Industry Classification System (NAICS) codes, and Metro travel forecast model

Description: Measure access by bicycling, walking, transit, and driving – region wide, in equity focus areas (people of color, English language learners and lower income), and in non-equity focus areas within the following travel times:

- Automobile – 20 minutes*
- Transit – 30 minutes*
- Bicycle – 20 minutes
- Walk – 20 minutes

*Includes access and egress times.

Analysis is based on the locations of existing community places and does not factor in possible additional community places as a result of population and employment growth. MetroScope spatially distributes non-residential land uses and employment at a coarse granularity; finer detail on the locations of community places is necessary to predict future community places growth. As a result, the increase in the number of community places which can be reached within a short driving, transit, walking, or bicycling trip may be greater than discussed in the findings.

Target or desired direction: No target. Desired direction is that by 2040, increase the number of community places accessible for the average household in equity focus areas compared to the average household in non-equity focus areas.

Per recommendation by the transportation equity work group, Metro will update performance measure and develop evaluation methods to measure the disparities gap in access to community places for households in equity focus areas for the next update of the RTP.

Findings: Region wide, the 2040 Constrained investment strategy increases the number of community places accessible within a short driving and transit trip. With the 2018 RTP investments through 2027, the average household in the region can get to 33 to 57 more community places in a short driving trip, or 78 to 100 more community places in a short transit trip depending on the time of day. With further investment slated for after 2028, the 2018 RTP investment strategy further increases the number of community places reached in a short driving or transit trip to upwards of 76 to 143 more community places accessible to the average household.

While the 2040 Constrained investment strategy is showing positive progress in the greater number of places accessible, little or no change in the number of community places accessible in a short walking or bicycling trip is observed as a result of the investment strategy. In general, the average household in the region can reach 66 community places in a short walk and 360 community places in a short bicycle ride. (See Attachment of Appendix E for full accessibility tables.) Nonetheless, individual investments in active transportation may have a more significant impact in increasing the number of community places reached for an individual community than what the system wide evaluation is showing.

Table 7.19 Change in the Number of Community Places Accessible Within a Typical Commute Time for Different Communities (commute time adjusted by form of travel)

Change in Total Number of Community Places Accessible in 2027 Constrained Compared to 2027 No Build						
All Community Places						
	Auto Rush Hour	Auto Non Rush Hour	Transit Rush Hour	Transit Non Rush Hour	Bike	Walk
Region	57	33	100	78	1	0
Equity Focus Areas	52	31	120	90	1	0
Non-Equity Focus Areas	59	35	72	60	1	1
Change in Total Number of Community Places Accessible in 2040 Constrained Compared to 2040 No Build						
All Community Places						
	Auto Rush Hour	Auto Non Rush Hour	Transit Rush Hour	Transit Non Rush Hour	Bike	Walk
Region	114	76	143	139	0	1
Equity Focus Areas	101	69	165	161	0	0
Non-Equity Focus Areas	123	79	109	105	1	1

Equity findings: When looking more closely at the analysis in the equity focus areas, the 2018 RTP 2027 Constrained and 2040 Constrained investment strategies result in more community places which can be reached in a short transit trip compared to the region and non-equity focus areas. This means the average household in the equity focus areas see a greater increase in the number of community places reached in a short transit trip compared to the average household in the region or in non-equity focus areas as a result of the investment strategy. The equity focus areas see an increase of 90 to 120 more community places reached in a 30-minute transit trip, depending on the time of day in the 2027 Constrained investment strategy. The number of community places further increases to 165 more reached with the 2018 RTP investments slated for the 2040 Constrained investment strategy. Whereas, the region and non-equity areas see an increase range from 60 to 109 (non-equity focus areas) and 78 to 143 (region) with the 2018 RTP investment strategy.

While the significant increases in the number of community places reached in a short transit trip for the average household in an equity focus area is a positive sign, when it comes to other forms of travel (i.e. driving, walking, and bicycling), the region and non-equity focus areas see a greater increase in the number of community places reached within a short trip. For example, in a 20 minute drive, depending on the time of day, the average household in the region can reach 114 more community places in 2040 as a result of the 2018 RTP investments. This is 13 more community places than the average household in an equity focus area. This means the average household in the region and in a non-equity focus area is seeing greater benefit in reaching community places in a short trip as a result of the 2018 RTP investment strategy compared to the average household in an equity focus area.

As described earlier in this section, minimal change was observed in the number of community places reached in a short bicycle or walking trip in the region. The same result is seen in non-equity focus areas and in equity focus areas. While the change is a difference of one more community place reached within a short bicycle or walking trip, the increase was generally observed more consistently in non-equity focus areas than equity focus areas. As described earlier in this section, the results may not fully show the increased numbers of community places reached as a result of the investment strategy since the analysis did not account for future community places to open as a result of population and employment growth creating new demand for places like grocery stores, doctors/dental offices, and other retail or services.

Additionally, as described more fully in the Access to Jobs analysis, the results for the number of community places reached within a short trip (15 minutes for bicycling, 20 minutes for walking) may not fully capture the benefits being gained by implementing the active transportation investments in the 2018 RTP. As new sidewalks and bikeways get built, new route options become available which may attract more out of direction travel to have a more pleasant walking or bicycling experience. This may result in trips taking longer than 15 or 20 minutes to get to different destinations, but more time spent in active travel and the associated health benefits.

The mixed results from the access to community places evaluation measure for the equity focus areas indicate further investigation is necessary to determine whether there is a potential disproportionate or disparate impact.

7.4.6 Access to bicycle and pedestrian parkways

Data source: Metro Regional Land Inventory System, Geographic Information Systems

Description: Evaluates Number and percent of households within ¼-mile of a bicycle or pedestrian parkway (the highest level regional bicycle and pedestrian facilities – typically built as regional multi-use trails or along arterials. See Chapter 4 for more detail on these routes).

Target or desired direction: No target for this measure. The desired direction is an increase in the number and share of households within a ¼ mile of a bicycle or pedestrian parkway

Findings: In the 2015 base year over 75 percent of households in the planning area are within ¼-mile of a regional bicycle parkway. This increases to over 77 percent in the 2027 Constrained system and slightly more in the 2040 Constrained and 2040 Strategic investment strategy.

Table 7.20 Number of households with access to regional bicycle parkways

Regional bicycle parkways	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
# of HH	477,937	573,569	602,046	655,960	706,232	712,351
% of HH	75%	74%	78%	73%	79%	79%

In the 2015 base year 86 percent of households in the planning area are within ¼-mile of a regional pedestrian parkway. This percent decreases slightly to 84 percent in the 2027 Constrained investment strategy, rising slightly to 85 percent in the 2040 Constrained and the 2040 Strategic investment strategy. One reason that the percent decreases in the future is that the RTP project list does not include many projects to complete pedestrian parkways in some of the newer growth areas on the edges of the region. As many of the pedestrian parkways are frequent-service transit routes, this reflects the difficulty of providing access to high-quality transit in these areas.

Table 7.21 Number of households with access to regional pedestrian parkways

Regional pedestrian parkways	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
# of HH	543,926	648,066	653,831	738,896	762,485	765,136
% of HH	86%	83%	84%	82%	85%	85%

7.4.7 Access to transit

Data source: Metro travel forecast model

Description: Number and share of households within 1/4-mile of bus, 1/3-mile from streetcar and ½-mile high capacity transit or frequent service transit, region-wide, and in equity focus areas households (POC and LEP) and (POC, LEP and LI)

Number and share of jobs within 1/4-mile of bus, 1/3 mile from streetcar and ½ mile high capacity transit or frequent service transit, region-wide and by subareas

Target or desired direction: Per the Climate Smart Strategy, the 2035 monitoring targets for access to transit are:

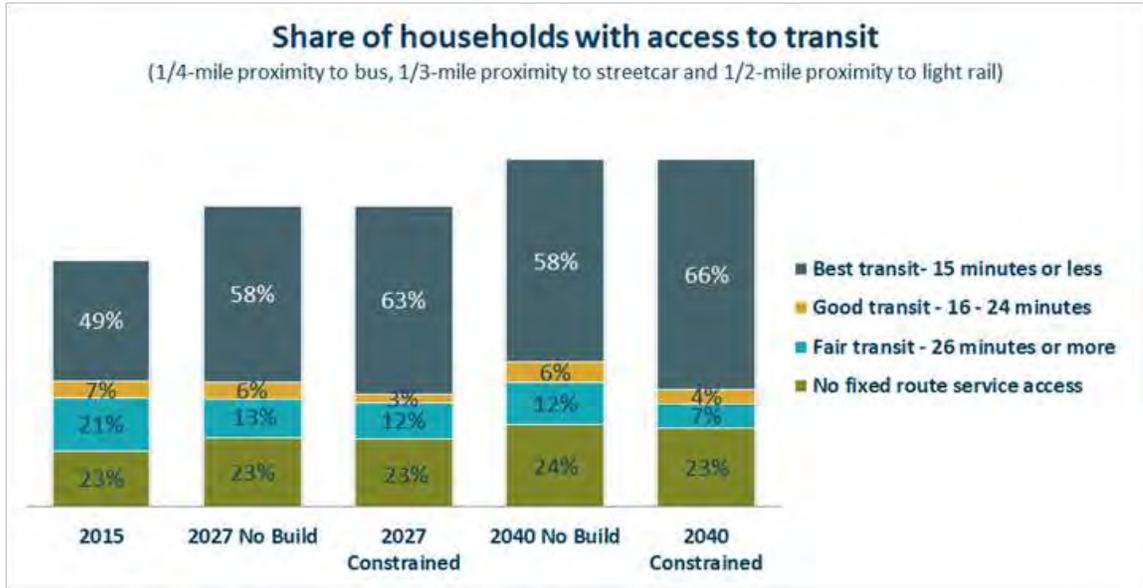
- 37 percent of households are within ¼-mile of all day frequent service
- 49 percent of low-income households are within ¼-mile of all day frequent service
- 52 percent of employment is within ¼-mile of all day frequent service:

Findings: Determining the ease, comfortableness, and directness of our transit system is no easy task, but the analysis shows that at the very least we are headed in the right direction. Under each of the investment strategies, the majority of the households and jobs in the region have access to 15-minute better transit service. Between 70-85 percent of the jobs in the region would be accessible by frequent service transit in 2040. The majority of the households, 60 -70 percent, in the region would also have access to frequent service transit. There would be a higher percentage of jobs and households with access to frequent service transit during the peak rush hours and off peak hours.

Equity findings: Low-income households region wide and in the equity focus areas would have greater percentage of households with access to frequent service compared to the region as a whole. Across the 2027 Constrained, 2040 Constrained and 2040 Strategic investment strategies transit access is expected to increase access for historically marginalized communities and communities of color are expected to outperform the region as a whole, something that puts the region one step closer to establishing a more equitable transit system.

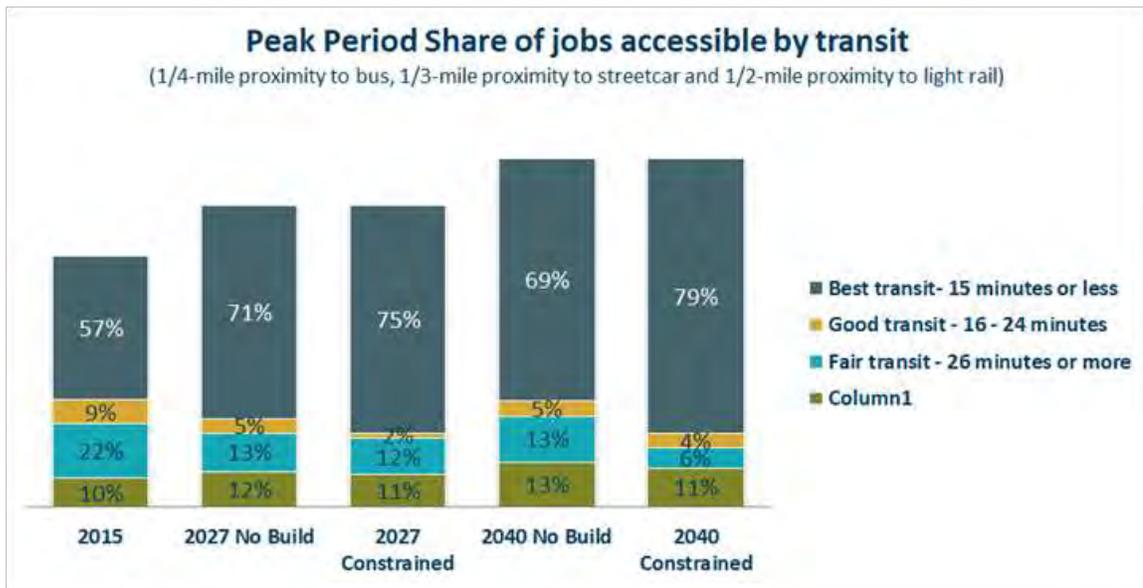
Proximity to stations: There is no motivation to use transit if it's geographically inaccessible, and even if it's geographically accessible there's no point in using it if it doesn't take you where you want to go. Good transit planning considers these concepts of access concurrently. The good news is that the future looks bright for both qualifiers of access. As the graph below highlights we can expect more than 3/4th of the region's households to have access (proximity) to transit by 2040, the majority being classified as "best transit" operating at 15-minute or better intervals. Additionally, 90 percent of the jobs in the region are accessible by transit. Figure 12 and 13 shows the percentages of households and jobs with access and frequencies to transit. Figures 14 through 17 present the access and frequencies for jobs, households, low-income households and low-income households in communities of color for various timeframes analyzed.

Figure 7.12 Share of households with access to transit



More than three-quarters of the households in the region are expected to be near higher frequency transit. The number of households with 15-minute or better transit service increases significantly between today and the future 2040 financially constrained investment strategies. The jobs in our region see even higher rates of transit access.

Figure 7.13 Share of jobs with access to transit

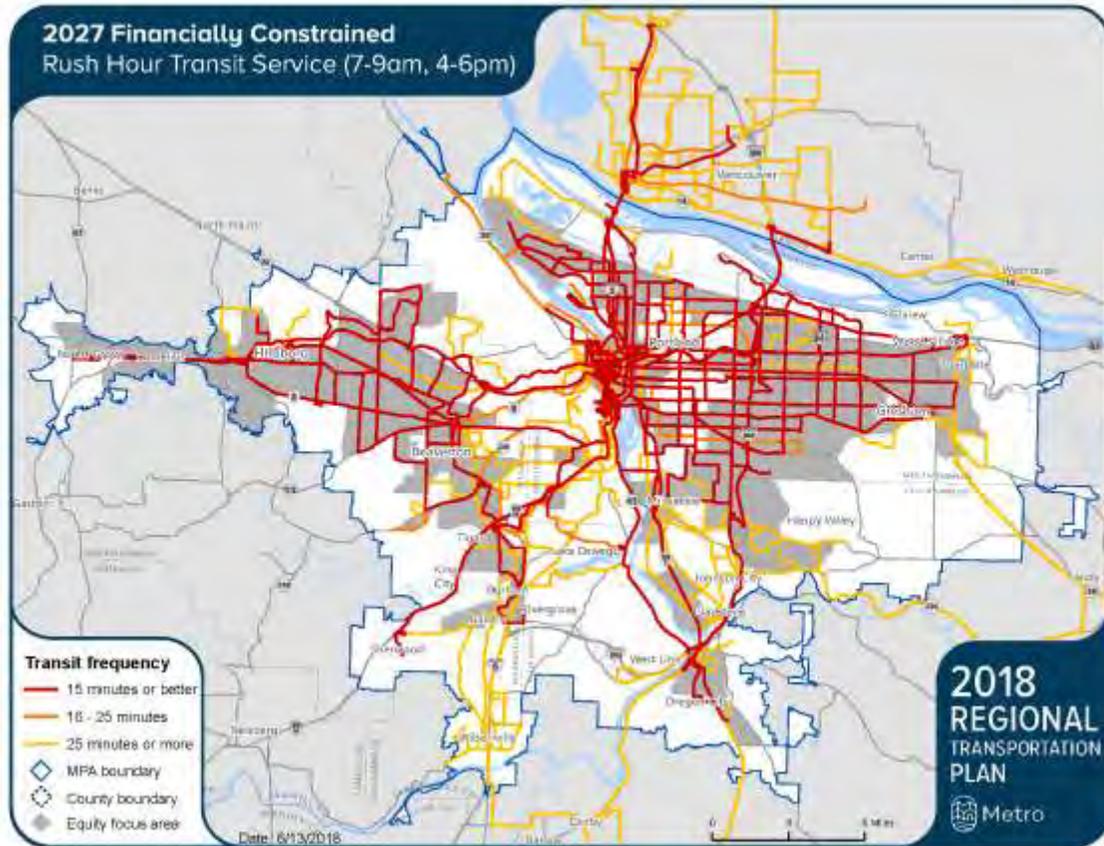


Approximately 90 percent of the jobs in the region are located near transit. As shown in the figure above, the number of jobs accessible by 15-minute or better transit service increases significantly between today and the 2040 financially constrained investment

strategies. The increase in transit service and frequencies means that more people are able to access job opportunities.

The following figures show transit service by Investment Strategy.

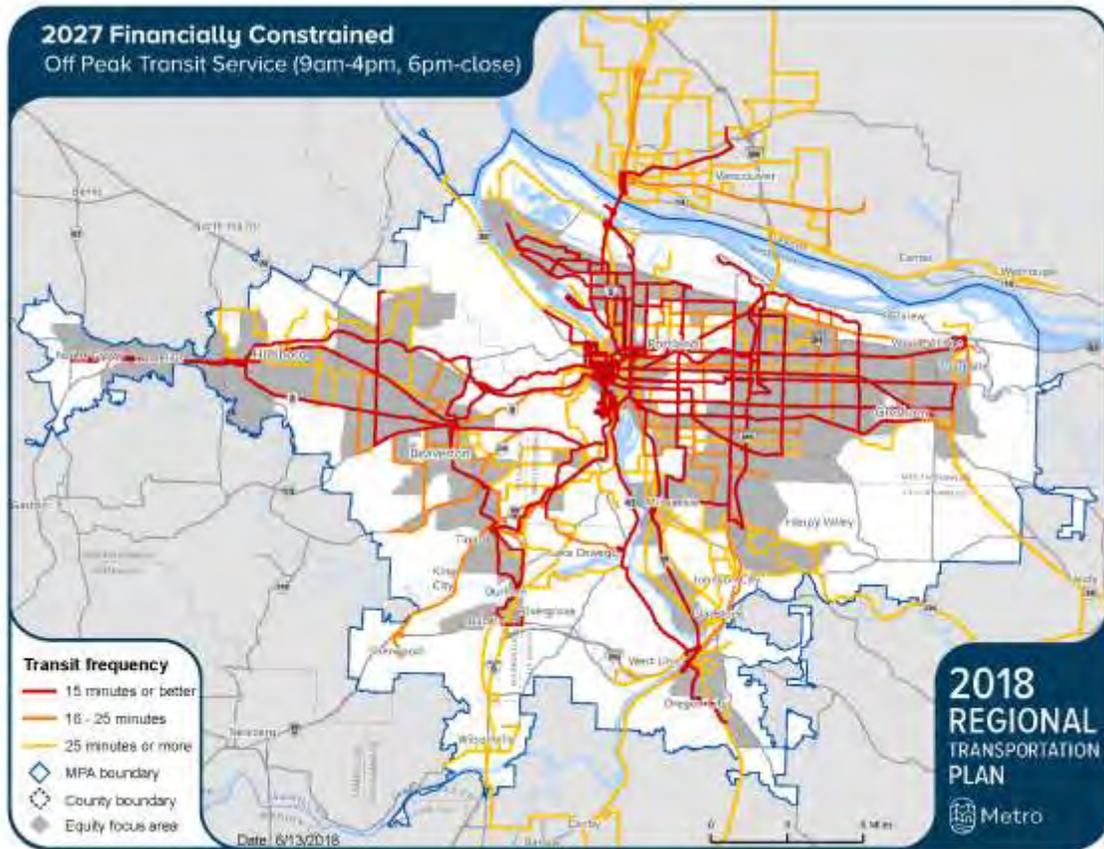
Figure 7.14 2027 Constrained Rush Hour Transit Service



Estimated share jobs and households near 15-minute or better rush hour service by 2027:

- 75% of jobs
- 63% of households
- 72% of low-income households
- 82% of low-income households in the equity focus areas

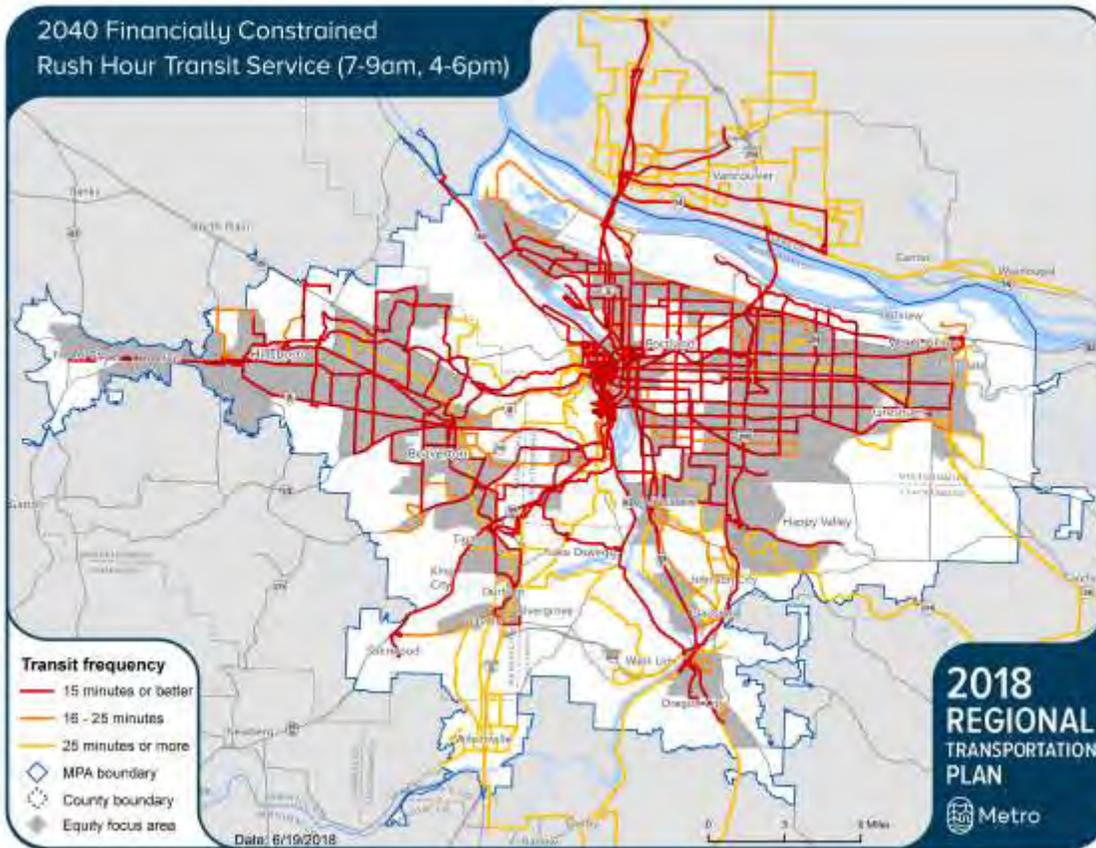
Figure 7.15 2027 Constrained Off-peak Transit Service



Estimated share of jobs and households near 15-minute or better daytime and evening service by 2027:

- 67% of jobs
- 53% of households
- 63% of low-income households
- 72% of low-income households in the equity focus areas

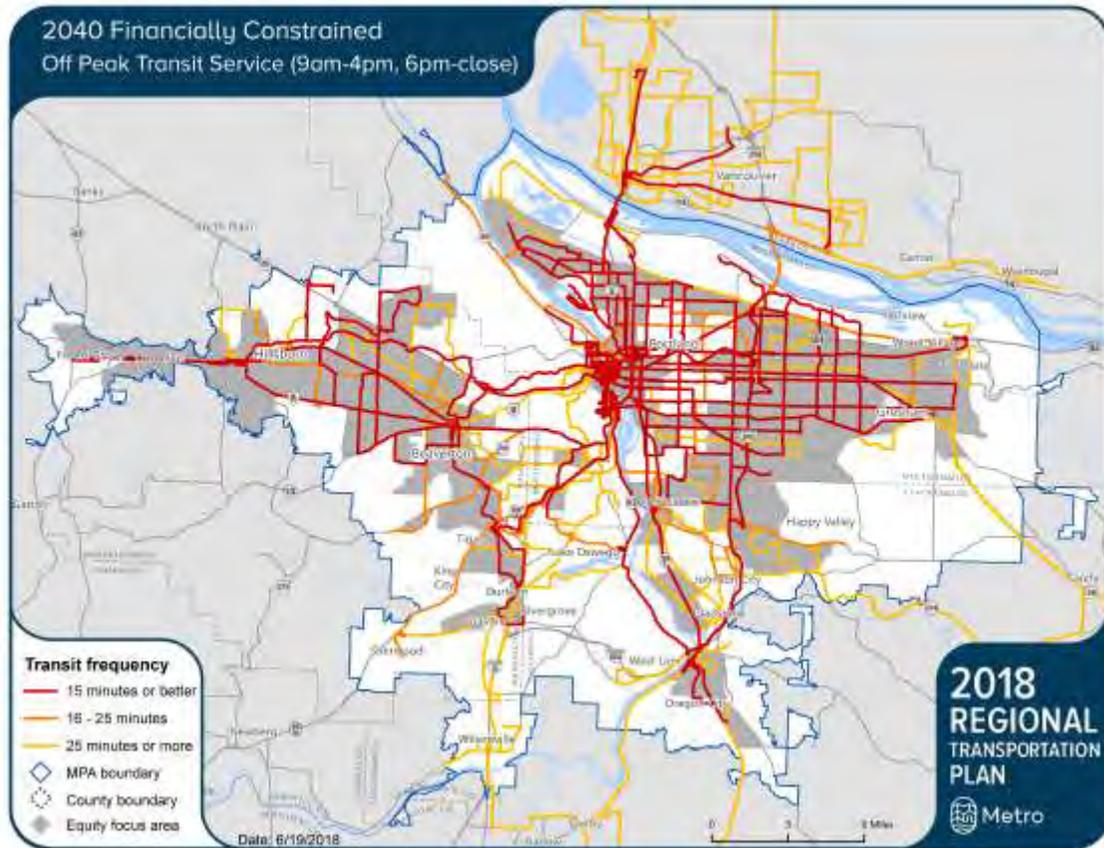
Figure 7.16 2040 Constrained Rush Hour Transit Service



Estimated of jobs and households near 15-minute or better rush hour service by 2040:

- 79% of jobs
- 66% of households
- 75% of low-income households
- 85% of low-income households in the equity focus areas

Figure 7.17 2040 Constrained Off-Peak Transit Service Access



Estimated share of jobs and households near 15-minute or better daytime and evening service by 2040:

- 72% of jobs
- 58% of households
- 69% of low-income households
- 79% of low-income households in the equity focus areas

7.4.8 Access to industry and freight intermodal facilities

Data source: Metro travel forecast model

Description: Extent that industrial land and freight intermodal facilities are transportation constrained. This measure was developed and tested, but not fully implemented or evaluated. The intent is 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).

Target or desired direction: There is no target for this measure. The desired direction is to reduce truck hours of delay on the freight network that provide access to intermodal facilities and industrial lands in 2040.

Findings: Incomplete and inconclusive due to testing 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 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.

Equity findings: Not included in transportation equity analysis.

7.4.9 Multimodal travel times

Motor Vehicle Travel Times

Data source: Metro travel forecast model

Description: Evaluates mid-day and pm peak travel time between 20 regional origin-destination pairs.

Target or desired direction: No target. Maintain motor vehicle travel times between key origin-destinations.

Findings: With the exception of the Central City to Vancouver corridor, motor vehicle travel time increases, generally by a few minutes, for all three 2040 investment strategies compared to the 2015 Base Year, for both travel periods and all origin-destinations. Evening peak travel times grow at a faster pace the mid-day travel times.

Overall, the 2040 Constrained and the 2040 Strategic investment strategies decrease motor vehicle travel time when compared to the 2040 No Build. Central City to Vancouver shows a 4-6 minute improvement in travel time in the 2040 Constrained.

Refer to Appendix I for tables showing travel times for each of the mobility corridors.

Equity findings: Not included in transportation equity analysis.

Transit Travel Times

Data source: Metro travel forecast model

Description: Evaluates mid-day and pm peak transit travel times between 18 origins and destinations across the region.

Target or desired direction: No target. Reduce transit travel times between key origin-destinations.

Findings: In general, most corridors see a decrease or maintaining of travel times in from 2015 Base Year to the 2040 Constrained; some corridors see decreases in transit time between 10 and 46 minutes. There are modest increases in transit travel times during the PM peak travel period from 2015 Base Year to the 2040 Constrained in some corridors. For example:

- Gateway to Vancouver Mall - decrease in travel time of 15.4 minutes in the 12-1 travel period and an decrease of 13.2 minutes in the 4-6 PM peak.
- Gateway to Oregon City - decrease in travel time of 12.4 minutes in the 12-1 travel period and an decrease of 12.8 minutes in the 4-6 PM peak.
- Clackamas Town Center to Oregon City- decrease in travel time of 13.4 minutes in the 12-1 travel period and an decrease of 9.5 minutes in the 4-6 PM peak.
- Tualatin to Oregon City - decrease in travel time of 35.3 minutes in the 12-1 travel period and an decrease of 12.4 minutes in the 4-6 PM peak.
- Tigard to Sherwood decrease in travel time of 10.5 minutes in the 12-1 travel period and an increase of 6.2 minutes in the 4-6 PM peak.
- Tualatin to Sherwood - decrease in travel time of 46.4 minutes in the 12-1 travel period and an decrease of 26.9 minutes in the 4-6 PM peak.

Refer to Appendix I for tables showing travel times for each of the mobility corridors.

Equity findings: Not included in transportation equity analysis.

Freight Travel Times

Data source: Metro Travel Forecast Model

Description: 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.).

Target or desired direction: No target. Maintain or decrease truck travel times for routes on the regional freight network within mobility corridors.

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

- CEID to Vancouver CBD: 12-1 PM = 20-21% less; 2-3 PM = 18-19% less
- CEID to Vancouver CBD: 5-6 PM = 23-24% less
- I-5 @Morrison Bridge to Tualatin Industrial: 12-1 PM = 7% less; 2-3 PM = 2-3% less
- I-5 @Morrison Bridge to Tualatin Industrial: 5-6 PM = 2% less
- I-84/I-205 to Fed Ex Troutdale: 12-1 PM & 2-3PM = stay the same
- I-84/I-205 to Fed Ex Troutdale: 5-6 PM = stay the same
- I-5 @Morrison Br. to Hillsboro Industrial: 12-1 PM = 3% less; 2-3 PM = stay the same
- I-5 @Morrison Br. to Hillsboro Industrial: 5-6 PM = stay the same

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 percent over the 2040 No Build strategies. However, for the other 3 major freeway corridors in the region (I-5 south, I-84 east of I-205 and US 26 west of Hillsboro) the truck travel times stay virtually the same or have only a slight reduction (3-7 percent) during off-peak travel times.

Refer to Appendix I for tables showing travel times for each of the mobility corridors.

Equity findings: Not included in transportation equity analysis.

Bicycle travel times

Data source: Metro Travel Forecast Model

Description: Evaluate changes in bicycle travel times between key origins and destinations.

Target or desired direction: No target. Decrease or maintain bicycle travel times between key origins and destinations.

Findings: Bicycle travel times do not change significantly in most corridors – bicycle travel times remain reliable. One notable exception is that the travel time between Lake Oswego and the Park Avenue MAX Station reduces by over 68 percent (from approximately 39

minutes to 12 minutes) due to the RTP project that will construct a bicycle and pedestrian bridge over the Willamette River between Lake Oswego and Oak Grove. See Appendix I for a table showing bicycle travel times within all origin/destination pairs.

Refer to Appendix I for tables showing travel times for each of the mobility corridors.

Equity findings: Not included in transportation equity analysis.

7.4.10 Congestion

National Highway System Travel Reliability

Data source: TBD

Description: Measures the change in reliable person-miles traveled on the Interstate System and on the non-Interstate National Highway System

Target or desired direction: By 2040, increase the TBD% of reliable person-miles traveled on the Interstate System and on the non-Interstate National Highway System.

Findings: This measure is under development and will be reported as the RTP is finalized.

Vehicle Hours of Delay Per Person

Data source: Metro travel forecast model

Description: Measures the change in vehicle hours of delay (VHD) per person within congested throughway corridors in the region compared to the 2040 No Build.

Target or desired direction: By 2040, reduce vehicle hours of delay per person by 10%, within the metropolitan planning area (MPA).

Findings: This measure is under development and will be reported as the RTP is finalized.

Interim Regional Mobility Policy

Locations of throughways, arterials, and regional freight network facilities that do not meet regional mobility policy.

Data source: Metro travel forecast model

Description: Identifies number and percent of network miles and locations within the Metropolitan Planning Area (MPA) that exceed the interim regional mobility policy for congestion in the one hour mid-day and two hour pm peak. Note that the mileage calculation is based on the length of the modeled network link associated with the point of congestion. It does not include the length of the queuing that occurs as a result of the congested link. Refer to Chapter 3 for interim regional mobility policy thresholds for congestion.

Target or desired direction: No Target. Desired direction is to reduce total miles of throughways and arterials that exceed the interim regional mobility policy thresholds for congestion.

Findings: All three 2040 investment strategies (2027 and 2040 Constrained and 2040 Strategic) see an increase the number of network miles that are congested, compared to the 2015 Base year.

Total congested miles ($v/c = 0.9$ to <1.0) in the 2040 No Build strategies are 50 miles greater during the mid day one hour and 71 miles greater during the two hour peak than they are in the 2015 Base. Total severely congested miles ($v/c \geq 1.0$) in the 2040 No Build strategies are 14 miles greater during the mid-day one hour and 76 miles greater during the two hour peak than they are in the 2015 Base. In 2040, total congested miles in the region are reduced by 41 percent in the mid day one hour in the 2040 Constrained compared to the 2040 No Build. Total severely congested miles in the region are reduced by 26 percent in the mid day one hour in the 2040 Constrained compared to the 2040 No Build.

The following tables show the number of miles of throughways and arterials that are congested or severely based on the volume/capacity ratio. Though congested, many of these miles meet the interim regional mobility policy. For example, in the 2040 Constrained investment strategy there are 53 throughway miles that are congested in the 4-6 PM time period, but only 33.7 of those miles do not meet the interim regional mobility policy at some point during the 4-6 PM commute time period. For all three 2040 investment strategies (2027 Constrained and 2040 Constrained and 2040 Strategic) there is an increase in the number of throughway and arterial network miles that do not meet the mobility policy, compared to the 2015 Base year.

Table 7.22 Congested Throughway Network Miles

	2015 Base Year		2027 No Build		2027 Constrained		2040 No Build		2040 Constrained	
	Mid Day (12-1)	PM Peak (4-6)								
Total Congested Throughway Miles ($v/c = 0.9$ to <1.0)	8	30	12	44	12	41	34	50	17	53
Total Severely Congested Throughway Miles ($v/c \geq 1.0$)	2	15	5	25	5	19	9	31	6	23

Table 7.23 Congested Arterial Network Miles

	2015		2027		2027		2040		2040	
	Base Year		No Build		Constrained		No Build		Constrained	
	Mid Day (12-1)	PM Peak (4-6)								
Total Congested Arterial Miles (.v/c= 0.9 to <1.0)	4	30	10	56	10	47	27	82	18	74
Total Severely Congested Arterial Miles (v/c >= 1.0)	3	16	5	38	5	34	10	60	8	50

The following tables identify number of miles of throughways and arterials that do not meet the interim regional mobility policy. Mileage is counted twice if both directions of a throughway or arterial segment do not meet the mobility policy. In the tables below “Both hours 4-6 PM” means the miles of throughways or arterials that do not meet the mobility policy during the full two hour peak period. Segments that do not meet the policy in only the 4-5 or 5-6 PM hours are not included in the miles of segments in the “Both hours 4-6 PM hours.”

Table 7.24 Throughway Network Miles Not Meeting Regional Mobility Policy

Travel period	2015	2027	2027	2040	2040
	Base Year	No Build	Constrained	No Build	Constrained
12 -1 PM	2.2	10.1	8.2	30.7	15.4
Both Hours 4-6 PM	4.7	21.0	12.9	27.6	17.7
One hour 4-5 PM*	9.7	13.0	13.6	14.1	13.0
One Hour 5-6 PM*	5.1	3.5	1.1	1.7	3.0
Total miles 4-6 PM	19.6	37.4	27.6	43.5	33.7

**Not included in “Both Hours 4-6 PM” network miles*

Table 7.25 Arterial Network Miles Not Meeting Regional Mobility Policy

Travel period	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained
12 -1 PM	5.8	11.2	12.1	28.9	19.1
Both Hours 4-6 PM	14.4	34.0	29.1	58.9	46.0
One hour 4-5 PM*	2.4	4.0	4.0	4.1	5.1
One Hour 5-6 PM*	2.8	7.3	5.9	6.6	7.1
Total miles 4-6 PM	19.6	45.3	39.0	69.6	58.1

**Not included in "Both Hours 4-6 PM" network miles*

Table 7.26 Percent Throughway Network Miles Not Meeting Regional Mobility Policy

Travel period	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained
12 -1 PM	1.46%	2.82%	3.04%	7.25%	4.73%
Both Hours 4-6 PM	3.61%	8.53%	7.32%	14.76%	11.36%
One hour 4-5 PM*	0.61%	1.00%	1.00%	1.04%	1.26%
One Hour 5-6 PM*	0.71%	1.83%	1.48%	1.64%	1.74%
Total miles 4-6 PM	4.93%	11.36%	9.80%	17.44%	14.36%

**Not included in "Both Hours 4-6 PM" network miles*

Table 7.27 Percent Arterial Network Miles Not Meeting Regional Mobility Policy

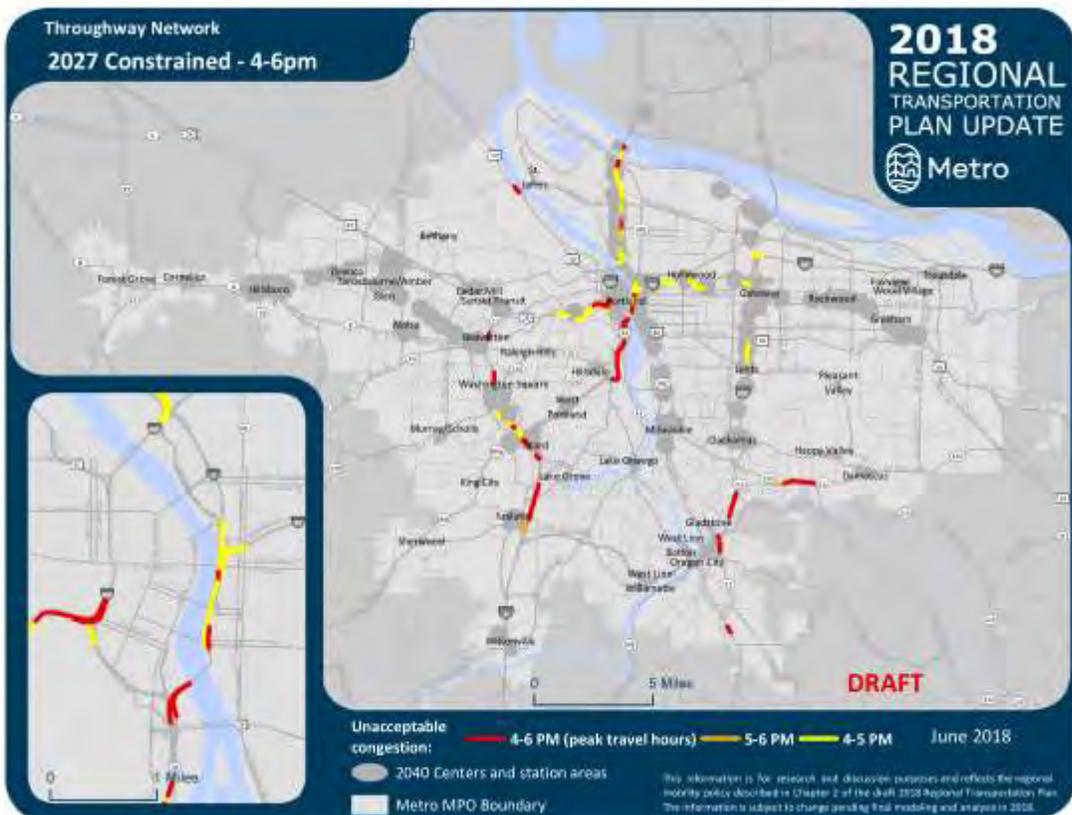
Travel period	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained
12 -1 PM	0.06%	0.26%	0.21%	0.80%	0.39%
Both Hours 4-6 PM	0.12%	0.54%	0.33%	0.71%	0.45%
One hour 4-5 PM*	0.25%	0.34%	0.35%	0.37%	0.33%
One Hour 5-6 PM*	0.13%	0.09%	0.03%	0.05%	0.08%
Total miles 4-6 PM	0.51%	0.97%	0.71%	1.13%	0.86%

**Not included in "Both Hours 4-6 PM" network miles*

Findings: The percent of throughway network miles not meeting the regional mobility policy, for total miles during 4-6 PM, climbs from 4.93% in the 2015 Base to 11.36% in 2027 and 17.44% in 2040 with the No Build strategies. However, the 2027 Constrained and 2040 Constrained improves those numbers to 9.5% and 14.36% respectively. Overall, the percent of throughway network miles not meeting the regional mobility policy keeps going up over time due to the large increases in regional population, and constrained investment strategies help reduce those increases, but are still greater than 2015.

The following maps highlight locations exceeding the mobility policy in either direction (identified as "unacceptable congestion"), showing the most congested segments in red.









Findings: On the throughway network during the PM peak, the 2027 Constrained on I-205 from Stafford Road to Highway 99E meets the regional mobility policy, where the 2027 No Build failed to meet the mobility policy in that segment of I-205 during both hours from 4-6 PM. The segment of I-5 between I-84 and the Fremont Bridge has more segments that meet the regional mobility policy in the 2027 Constrained than in the 2027 No Build. In the 2027 No Build the length of I-5 that does not meet the mobility policy during the 4-5 PM hour is much longer than in the 2027 Constrained, and a short segment fails to meet the policy during both hours from 4-6 PM.

On the throughway network during the PM peak, the 2040 Constrained on Highway 224 from 122nd to Rock Creek Junction (224/212 split) meets the regional mobility policy, where the 2040 No Build failed to meet the mobility policy in that segment of Highway 224 during both hours from 4-6 PM.

Freight Truck Delay

Data source: Metro travel forecast model

Description: Evaluates truck delay for freight movement using the regional freight roadway network in the two-hour AM peak (7-9 AM), the two-hour mid-day travel period (1-3 PM) and in the two-hour pm rush hour (4-6 PM). Figure 2.15 provides a map of the regional freight system which includes the roadway network. The hours of delay are reported in the table below for trucks. The truck delay is only accrued when the volume of all vehicles exceeds 90 percent of the roadways capacity.

Target or desired direction: By 2040, reduce vehicle hours of delay per truck trip by 10% compared to 2015.

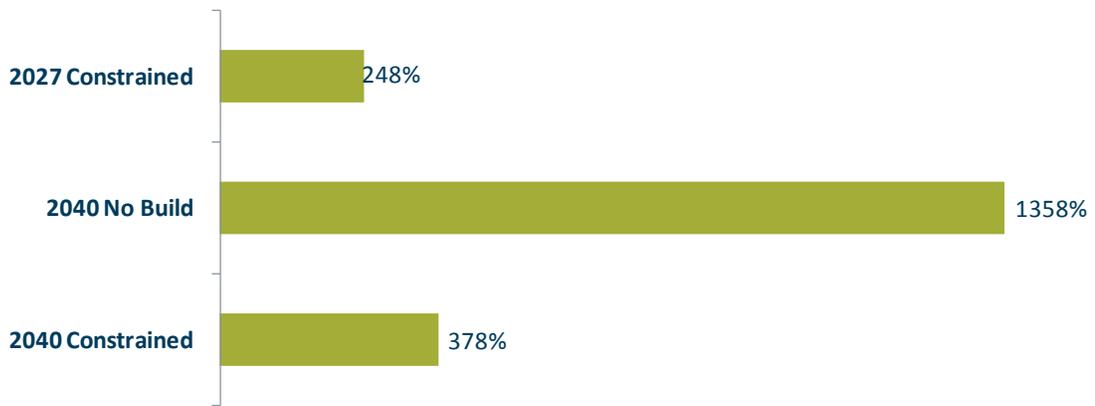
Findings: Between 2015 and 2040, truck delay on the regional freight network increases significantly for all investment strategies during all three time periods. However, when compared with the 2040 No Build both 2040 RTP investment systems show a slower pace of growth in delay in each travel period (example is 1-3 PM as shown in bar chart below). In the two-hour mid-day (1-3 PM) the 2040 Financially Constrained truck delay is 65 percent less than the 2040 No Build and the 2040 Strategic truck delay is 69 percent 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 percent and 29 percent, respectively.

Table 7.28 Truck Vehicle Hours of Delay (VHD) on the Regional Freight Network

Travel period	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained
7-9 AM peak hours of delay	219	456	393	724	500
1-3 PM Mid-day hours of delay	55	217	164	802	263
4-6 PM peak hours of delay	154	364	290	576	409

Figure 7.18 Percent change in truck hours of delay on the regional freight network, 1-3 pm

Truck hours of delay from 1-3pm on regional freight network
(percent change from 2015)



Total Cost of Traffic Delay on Freight Network

Data source: Metro travel forecast model

Description: Evaluates average cost of delay for freight movement in the two hour am peak period (7-9am), the two-hour mid-day travel period (1-3pm) and in the two-hour pm peak period (4-6pm). Values of time are taken from ODOT report The Value of Travel-Time: Estimates of Hourly Value of Time for Vehicles in Oregon in 2016. The cost of delay takes into account both auto and truck delay that occurs on the regional freight network. Auto value of time is calculated at \$23.68 per hour. The value of time for trucks include both time of the driver as well as operating expenses. The travel forecast model distinguishes medium and heavy trucks. Medium trucks are identified as two-axle, six-tire, single-unit vehicles (Class 5). The value of time for medium trucks is calculated at \$28.20 per hour. Heavy trucks are vehicles with 3 or more axle single unit or trailers (Class 6 and above). The value of time for heavy trucks is calculated at \$30.72 per hour. The travel

forecast model allocates 35 percent of trucks to medium category and 65 percent to heavy category. All values are held constant for both 2015 and 2040.

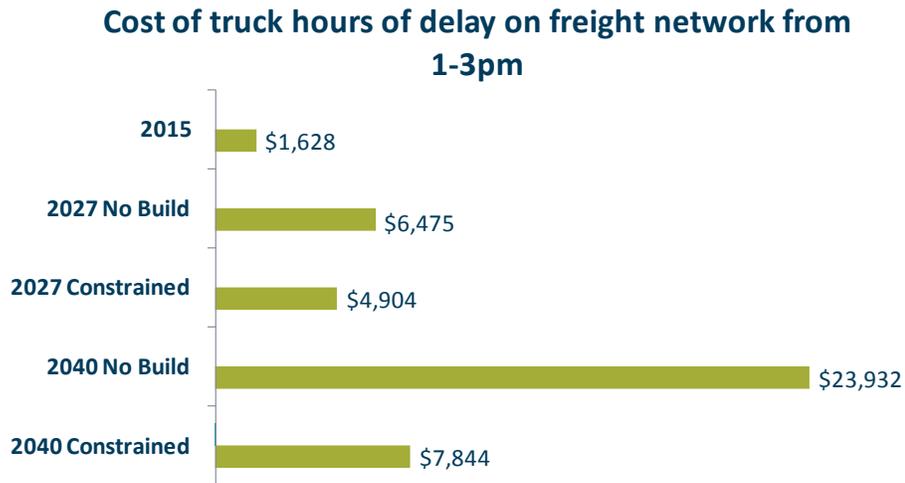
Target or desired direction: No target. Desired direction is to reduce growth in cost of delay (in constant dollars) on the regional freight network in the two-hour mid-day and two-hour pm peak as compared to the 2040 No Build strategies.

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 65 percent - 70 percent 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 Packages reduce cost of delay by 27 percent -29 percent compared to the 2040 No Build.

Table 7.29 Cost of Truck Vehicle Hours of Delay (VHD) on the Regional Freight Network within the MPA (delay accrued where v/c exceeds 0.9)

Travel period	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained
7-9 AM peak hours Cost of delay	\$6,534	\$13,604	\$11,715	\$21,598	\$4,921
1-3 PM Mid-day Cost of delay	\$1,628	\$6,475	\$4,904	\$23,932	\$7,844
4-6 PM peak hours Cost of delay	\$4,594	10,852	\$8,646	\$17,185	\$12,203

Figure 7.19 Cost of truck hours of delay on the freight network, 1-3 pm



7.4.11 Transit efficiency and ridership

Data source: Metro Travel Forecast Model and area transit agencies

Description: Evaluates average weekday (AWD) transit boarding rides per revenue hour for high capacity transit and bus combined.

Target or desired direction: No Target. Increase AWD transit boarding rides and revenue hours of service

Findings: Total boardings and revenue hours of transit service both increase dramatically between 2010 and 2040. The 2027 and 2040 Financially Constrained Investments Strategies show and increase in AWD boardings and revenue hours of service over the 2027 and 2040 No Build reflecting the addition of new high capacity transit and expanded bus service.

Table 7.30 Transit productivity

Transit productivity	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Total Boardings	428,740	615,330	769,150	740,000	1,084,520	Not evaluated
Daily Revenue Hours	6,430	7,390	8,880	7,560	10,290	9,400
AWD transit boardings/revenue hour*	65	80	85	100	105	Not evaluated

*For the entire region including transit agencies serving Clark, Clackamas, Multnomah and Washington counties

Figure 7.20 Boardings per revenue hour

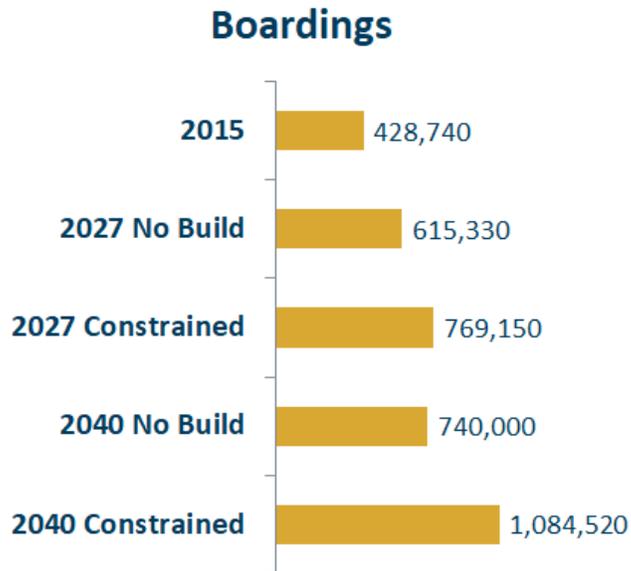


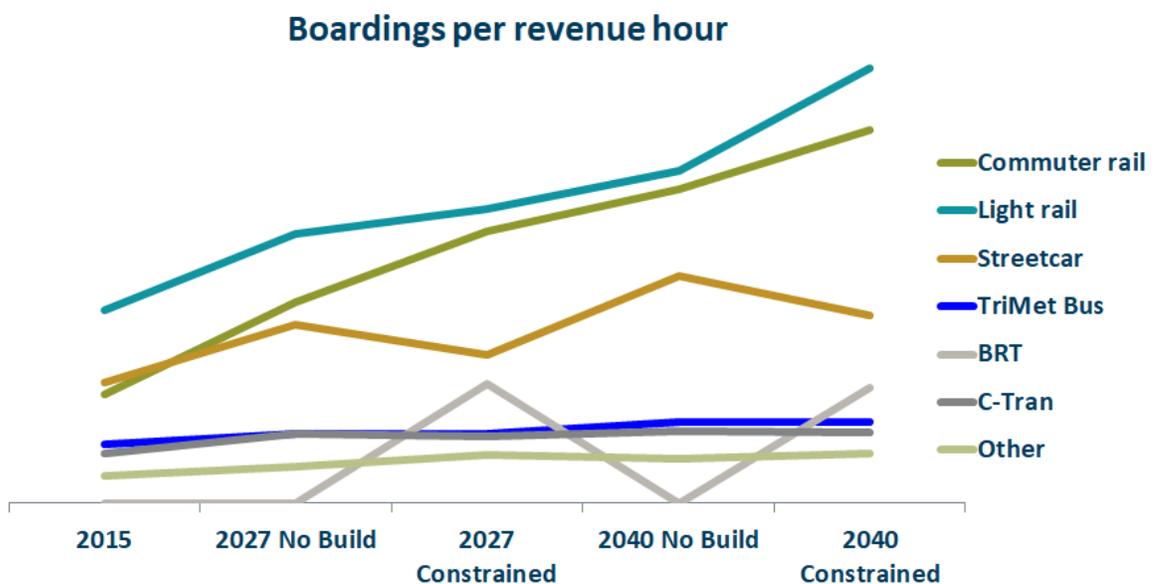
Figure 7.21 Revenue hours of service



Figure 7.22 Average Weekday (AWD) Transit Boardings per Revenue Hour



Figure 7.23 Average Weekday (AWD) Transit Boardings per Revenue Hour by transit mode



7.4.12 Climate change

Data source: Transportation project information input into Metro’s travel demand model for outputs to be included in the U.S. EPA approved MOVES2014a emission model.

Description: Evaluates projected mobile source emissions of carbon dioxide (CO₂) a primary greenhouse gas pollutant. Determines greenhouse gas emissions per capita in the base year and for 2027 and 2040 to determine if greenhouse gas emissions are declining per capita.

Metro estimates future mobile source greenhouse gas emissions by using existing and proposed transportation project information and inputting the project information into the travel demand model to understand the travel behavior in the region with and without proposed investments at key times in the future. Key travel behavior outputs include trip generated, mode split (i.e. percentage of trips taken by different transportation modes), trip distances, and vehicles miles traveled. This information is then taken into a post-processing emissions model (known as MOVES2014a) which includes information about vehicle fleet mix, fuel composition, and emissions rates to determine what the projected emissions of greenhouse gases would be with and without the proposed transportation investments for the Portland airshed in 2027 and 2040. Then the emissions are divided by projected population estimates to understand emissions per capita and ultimately the reduction level.

Target or desired direction: The target adopted in the 2014 Climate Smart Strategy is to reduce per capita greenhouse gas emissions from cars and small trucks by 20 percent by 2035 and 25 percent by 2040, compared to 2005 levels.

To assess progress towards the target, the region's Climate Smart Strategy calls for the implementation of nine key land use and transportation policies to reduce greenhouse gas emissions and meet a regionally set target of 29 percent below 2005 emissions levels. Monitoring targets are used to track progress. One of the most significant transportation strategies outlined in the Climate Smart Strategy is increasing transit service hours. The Climate Smart Strategy called for 9,400 transit service revenue hours to meeting the region's greenhouse gas reduction target. Refer to Appendix J for details on the monitoring targets and performance outcomes.

Findings: The 2018 RTP investment strategy reduces daily tons of greenhouse gas emissions from 2015 by 12 percent in 2027 and 19 percent by 2040. Annual per capita tons of greenhouse gas emissions go down in the 2027 and 2040 Constrained investment strategies. The 2040 Constrained investment strategies does not quite reach the Climate Smart Strategy of a 25 percent reduction by 2035, but the 2040 Strategic strategies does, with a 27 percent reduction of annual greenhouse gas emissions per person. This indicates that additional funding and prioritization of Climate Smart Strategy policies may be needed to achieve greenhouse gas emission targets by 2035.

The reduction in greenhouse gas emissions is a positive sign recognizing the region is expected to grow by over 500,000 people and 300,000 more jobs by 2040. In general the mix of multimodal transportation projects combined with fleet turnover, technology, and fuel economy assumptions is making progress in addressing climate change and helping to achieve the region's Climate Smart Strategy.

By 2040 it is expected that the region's transit system will be delivering 9,513 transit service revenue hours, exceeding the Climate Smart Strategy monitoring target of 9,400 transit service hours.

Equity findings: Not included in transportation equity analysis.

Table 7.31 Projected Mobile Source Greenhouse Gas Emissions by Investment Strategy

	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Average daily transportation-source GHG emissions (Carbon dioxide (in tons, measured in summer))	14,420	12,774	12,627	11,944	11,673	11,596
Percent Reduction Per/Day	N/A	11%	12%	17%	19%	20%
Annual Per Person Reduction from 2015 (Tons)	N/A	.3	.3	.4	.5	.5
Annual Per Person Reduction from 2015 (Percent)		-10%	-12%	-16%	-21%	-20% in 2035 -25% in 2040

Note: Annual per person greenhouse gas emissions in 2015 were 3.3 tons

7.4.13 Clean air

Data source: Transportation project information input into Metro’s travel demand model for outputs to be included in the U.S. EPA approved MOVES2014a emission model.

Description: Evaluates projected mobile source emissions of criteria pollutants: carbon monoxide (CO), nitrogen oxide (NO_x), volatile organic compounds (VOC), and particulate matter (PM₁₀ and PM_{2.5}) and transportation-related air toxics.⁸

Metro estimates future mobile source emissions by using existing and proposed transportation project information and inputting the project information into the travel demand model to understand the travel behavior in the region with and without proposed investments at key times in the future. Key travel behavior outputs include trip generated, mode split (i.e. percentage of trips taken by different transportation modes), trip distances, and vehicles miles traveled. This information is then taken into a post-processing emissions model (known as MOVES2014a) which includes information about vehicle fleet mix, fuel composition, and emissions rates to determine what the projected

⁸ Nitrogen oxide and volatile organic compounds are precursors to Ozone. Transportation-related air toxics are: Acrolein, Arsenic, Benzene, 1,3-Butadiene, Chromium 6, Diesel particulate matter plus diesel exhaust organic gases (Diesel PM), Formaldehyde, Naphthalene, Polycyclic organic matter

emissions of individual air pollutants would be with and without the proposed transportation investments for the Portland airshed in 2027 and 2040.

Target or desired direction: Decrease the amount (e.g. grams, ounces, pounds, or tons) of mobile source air pollutants in the 2027 Constrained and 2040 Constrained compared to the 2015 Base Year.

Findings: The 2018 RTP investment strategy in 2027 and 2040 show a significant reduction of criteria pollutants and transportation-related air toxics mobile source pollution compared to 2015 base year emissions. Certain pollutants including carbon monoxide, volatile organic compounds, benzene, and naphthalene gas see significant reductions in the pounds or grams of emissions reduced by 2027 and further in 2040. In looking more closely, the investment strategy also provides further reductions from the no-build conditions in 2027 and 2040, meaning despite projected population growth and economic activity, the region’s investment in a multimodal transportation system is making progress in reducing mobile source air pollution emissions.

Equity findings: Not included in transportation equity analysis.

Table 7.32 Projected Mobile Source Emissions by Investment Strategy and by Air Pollutant

Average daily pollutant emissions	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Carbon monoxide (CO) (Winter)(pounds)	223,827	147,341	146,386	77,891	77,256	Not evaluated
Nitrogen oxide (NOX) (Summer) (pounds)	61,159	14,558	14,466	8,630	8,535	
Volatile organic compounds (VOC) (Summer) (pounds)	13,309	4,273	4,219	3,024	2,936	
Particulate Matter 10 exhaust (PM ₁₀) (Winter) (pounds)	1,739	566	562	319	314	
Particulate matter 2.5 exhaust (PM _{2.5}) (Winter) (pounds)	1,575	509	505	285	281	
Acrolein (Summer) (pounds)	16	5	5	3	3	
Arsenic (Summer)(grams)	68	79	79	90	88	
Benzene (Summer) (pounds)	356	83	82	46	45	

Average daily pollutant emissions	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
1,3-Butadiene (Summer) (pounds)	41	5	5	2	2	
Chromium 6 (Summer)(grams)	0.4	0.4	0.4	0.5	0.4	
Diesel Particulate Matter* (Summer) (pounds)	621.7	145.0	143.8	53.1	52.4	
Formaldehyde (Summer) (pounds)	252	85	84	65	64	
Naphthalene Gas (Summer)(grams)	14,398	3,953	3,913	2,470	2,410	

Note: Results show Summer or Winter pollution

Figure 7.24 Projected Mobile Source Criteria Pollutant Emissions by Investment Strategy

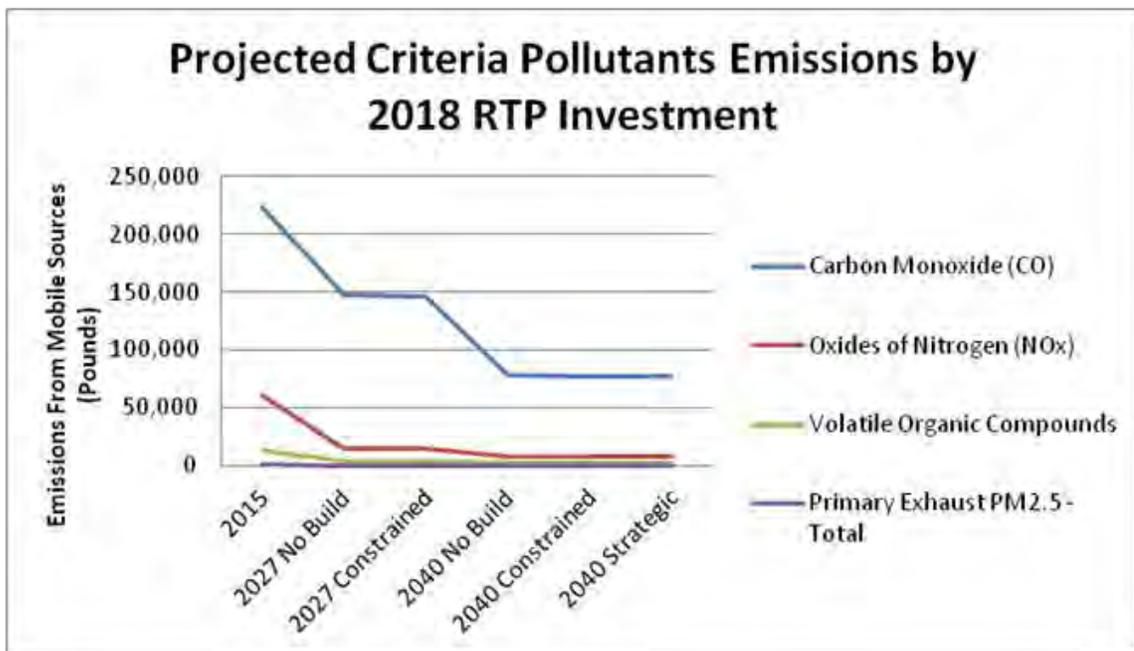
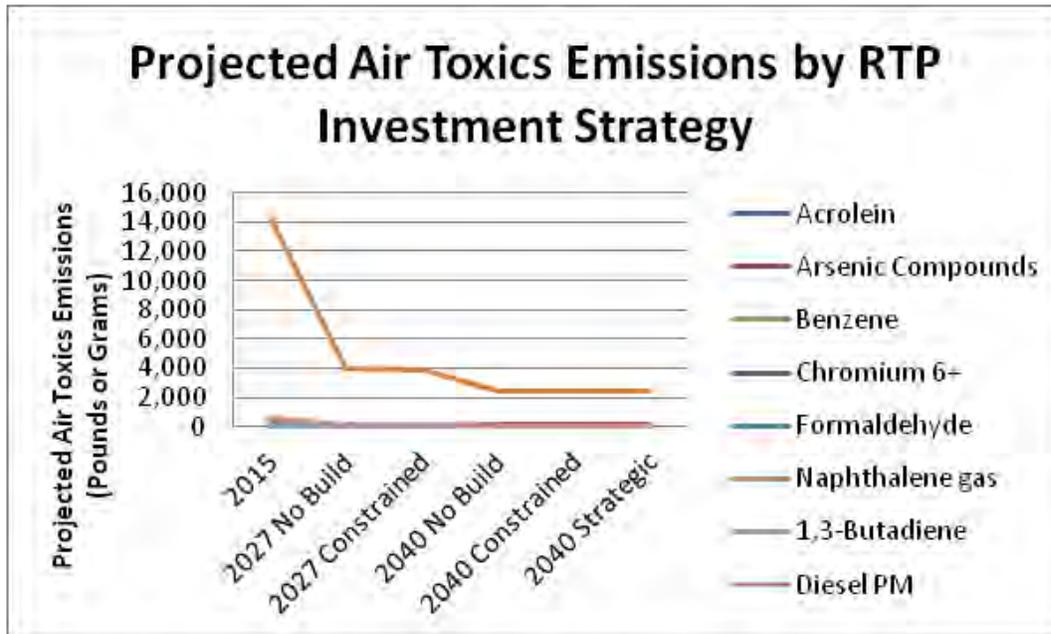


Figure 7.25 Projected Mobile Source Air Toxics Pollutant Emissions by Investment Strategy



7.4.14 Potential habitat impact

Data source: Regional Conservation Strategy data developed and maintained by the Intertwine Alliance in partnership with Metro.⁹

Description: Evaluates the potential impacts of transportation projects on identified regional and urban high value habitat areas defined in the Regional Conservation Strategy.¹⁰

This analysis used the Regional Conservation Strategy’s high value habitat as its basis. The Regional Conservation Strategy serves as a framework for efforts to conserve biodiversity within the greater Portland-Vancouver region. Data was developed from 2010 to 2013 by the Intertwine – a broad coalition of public, civic, private, and nonprofit organizations. The analysis considered many features, including existing vegetation, wetlands, hydric soils, floodplains, habitat patch size and shape, distance from streams and wetlands, and the presence of roads. High Value areas ranked in the top quarter of all areas because of the type, location, and size of their habitat.

The RTP project lists in Appendix A, B and C identify projects that intersect with high-value habitat areas. It is important to note a project’s inclusion on this list does not guarantee the project will impact a given environmental resource; rather, the agency

⁹ Information about development of the Regional Conservation Strategy and data can be found at: www.regionalconservationstrategy.org

¹⁰ A map of the regional and urban high value habitat areas can be found at: www.regionalconservationstrategy.org/document/8

responsible for the project should be aware of its potential impacts and work to mitigate any potential issues during the project development phase. Potential environmental mitigation activities are described in Chapter 3 of the Plan.

Target or desired direction: There is no target for this measure. The desired direction is to avoid sensitive habitats

Findings: Potential project impacts are shown in **Table 7.31** for each investment strategies. A total of 508 projects in the 2040 Constrained list intersect with high value habitats identified in the Regional Conservation Strategy. Overall, these projects make up nearly 60 percent of the total 2018 RTP investment strategy, excluding operations and programmatic projects.

While many RTP projects overlap with identified high value habitats, it is important to note that the potential alignments for many proposed projects are conceptual until more detailed project development work is conducted. Projects that intersect high value areas should consider alignment options that avoid the resource area as well as environmental mitigation strategies during future project development as described in Chapter 3 of the Plan. Identifying these areas of potential conflict early in the transportation planning process allows for more meaningful consideration of mitigation strategies, including project alignment, design and construction features that avoid or minimize impacts on the resource area. Many of these strategies are addressed specifically during the project development phase as part of the environmental and land use review, consultation and permitting processes all construction projects must undergo.

Table 7.33 Potential Habitat Impact Analysis

	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Number of projects that intersect high value habitat areas	N/A	N/A	245	N/A	508	Not evaluated
Percent of all RTP projects that intersect high value habitat areas	N/A	N/A	35%	N/A	73%	Not evaluated

Note: Operations and programmatic projects were not included in this analysis.

Table 7.34 2040 Constrained RTP Projects Potentially Impacting Environmental Resources by Project Type

Type of capital project	High value habitat areas
Roads and bridges	199
Throughways	22
Transit capital	22
Freight	13
Bike and pedestrian	225
Transportation System Management	27

Note: Operations and programmatic projects were not included in this analysis.

7.4.15 Potential impacts to historic and cultural resources and tribal lands

Data source: Tribal lands data from the Bureau of Indian Affairs and listed historic properties data from the National Register of Historic Places.

Description: Evaluates the potential impacts of proposed RTP projects on listed historic and cultural resources and tribal lands identified in the metropolitan planning area.

Target direction: None.

Findings: Metro reviewed tribal lands data available from the Bureau of Indian Affairs to identify potential federally recognized tribal lands in the planning area. No tribal lands were identified within or adjacent to the metropolitan planning area.

In addition, Metro reviewed data from the National Register of Historic Places. More than 650 historic places and structures have been listed in the National Register in the planning area. The data is available upon request from the Metro Research Center. ¹¹

Using Geographic Information System (GIS) mapping software and data from National Register of Historic Places, the analysis identified 72 projects within the planning area that are located within 100 feet of historic properties listed in the National Register, of which 62 projects are in the 2040 Constrained list.

¹¹ For more information on each site visit www.nationalregisterofhistoricplaces.com/or/state.html and click on Clackamas, Multnomah or Washington County.

Table 7.35 2040 Constrained RTP Projects Potentially Impacting Historical and Cultural Resources by Project Type

Type of capital project	Number of projects located within 100 feet of listed historic and cultural resources	Number of projects located on tribal lands
Roads and bridges	21	0
Throughways	1	0
Transit capital	17	0
Freight	1	0
Bike and pedestrian	17	0
Transportation System Management	5	0

Note: Operations and programmatic projects were not included in this analysis.

The historic and aesthetic value of the built environment is also recognized as key to the quality of life of the region’s residents. Where transportation improvements are developed which may impact on such resources, appropriate mitigation and design elements should be addressed. Section 106 of the National Historic Preservation Act (NHPA) requires all federal agencies to take into account the effects of their undertakings on historic properties. All properties listed in the National Register are protected by the Oregon State Historic Preservation Office (SHPO).

Oregon Revised Statute (ORS) 358.653 requires state agencies and all “political subdivisions” of the state—including counties, cities, universities, school districts and local taxing districts—to consult with the Oregon State Historic Preservation Office to avoid inadvertent impacts to historic properties for which they are responsible. Impacts are usually the result of construction projects, but may also include the transfer of properties out of public ownership.

Potential transportation project related impacts to historic and cultural resources may include physical changes to historic transportation infrastructure, effects of road widening on historic settings or structures, effects on historic roadside elements, effects of air pollution on resources due to increased traffic, and disturbance or infringement on cultural landscapes. The nature of these impacts is highly location and project specific, and the information about historic and cultural resources is constantly evolving. It is important for each project to be evaluated in the specific context and timeframe in which it is designed with up-to-date information. Typically mitigation activities include the preservation and documentation of these assets along with context-sensitive design of new or renovated infrastructure to complement existing streetscape or architectural features as closely as possible. Identifying these areas of potential conflict early in the

transportation planning process allows for more meaningful consideration of mitigation strategies, including project alignment, design and construction features that avoid or minimize impacts on the historic and cultural resources in the project area. Many of these strategies are addressed specifically during the project development phase as part of the environmental and land use review, consultation and permitting processes all construction projects must undergo.

7.4.16 Public health

Data source: Integrated Transport and Health Impacts Model (ITHIM), MOVES model and regional travel model, Oregon Health Authority vital statistics

Overall description: Metro partnered with Multnomah County Public Health and the Oregon Health Authority to estimate the health effects of regional transportation investments using the Integrated Transport and Health Impacts Model (ITHIM). ITHIM uses information about travel behavior to estimate changes in chronic disease and premature deaths associated with lack of physical activity and from air pollution – two documented leading causes of death and chronic disease in the greater Portland region. (Metro and the Oregon Health Authority (OHA) used ITHIM in a series of Health Impact Assessments (HIAs) during the Climate Smart Strategy planning process that concluded in 2014.)

For the 2018 RTP, Metro, Multnomah County Public Health and the OHA used ITHIM to estimate changes in death and disease resulting from a change in travel behavior attributed to the investments proposed in the 2018 RTP. Three key pieces of information are needed to run ITHIM: average minutes of walking and cycling per person per week, and change in fine particle (PM2.5) pollution.

Metro modeled travel behavior for the Base Year and each of the investment strategies; walking and cycling minutes include trips accessing transit stops. Using the MOVES model, Metro estimated change in the mass of fine particulate matter (PM2.5) released by mobile sources for each scenario. MOVES outputs are in units of mass (e.g. grams per year), but ITHIM uses a concentration to estimate health benefits. Although there is not a standard practice for converting a mass estimate to a concentration, the analysis used a recent PM2.5 inventory provided by the Oregon Department of Environmental Quality for Multnomah County suggesting that on-road emissions account for approximately 11% of fine particle pollution. Using 2015 monitor data from three air monitors in the region, an average baseline concentration was calculated. The final step was applying the percentage changes from MOVES to the portion of PM2.5 attributable to on-road sources in the region, resulting in estimates for each investment strategy. These estimates do not account for changes in particle pollution from other sources, such as residential wood combustion or industrial point sources.

2015 Base Year death and burden of disease estimates for each disease were compiled from Oregon Health Authority vital statistics. Number of deaths between 2011-2015 were

downloaded from the Oregon Public Health Assessment Tool (OPHAT) and averaged for the five year period. Disability Adjusted Life Years (DALY) are calculated by summing Years of Life Lost (YLL) and Years of Living with a Disability (YLD) for each disease. DALYs are a unit of disease burden that combine years of life lost with years of living with a disability. When summed across a population, changes in DALYs can be thought of as changes in the burden of disease within that population. YLL are calculated using the World Health Organization (WHO) DALY Template from number of deaths by age group, gender and life expectancy at the time of death. YLD are imputed for the Metropolitan Planning Area from WHO Global Burden of Disease 2010 estimate for the US.

For future years, population numbers changed but the age distribution was kept the same across all investment strategies. This enables more direct comparisons with 2027 Constrained investment strategy and isolates the effect of changes in travel behavior.

As in most scenario modeling exercises, these results should be interpreted primarily as a way to compare investment strategies, as opposed to a prediction of what will likely come to pass. The results reported here are not a comprehensive estimate of health effects. ITHIM omits several diseases and causal pathways that are related to transportation, but for which no model module has been created. Among the effects not modeled are diseases and deaths associated with traffic noise, non-particle air pollution, and traffic injuries. Both noise and air pollution are associated with cardiovascular disease and diabetes (Babisch, 2014; Dzhambov, 2015). The estimate of risks from air pollution are not adjusted for noise. Although ITHIM includes a model for injuries, the input data necessary to use it was not available. This shortcoming is notable because of the high burden of death and disability from traffic crashes. Unintentional injuries were the fourth leading cause of death in the 3-county area from 2012-2016. Including traffic crashes could therefore substantially alter estimates of health impacts from the RTP. Finally, estimates are based on present disease rates, not projected rates based on estimated trends.

Overall findings: The burden of premature death and disease decreases under all investment strategies, with the 2040 Strategic slightly outperforming the 2040 Constrained in comparison to the 2040 No-Build Scenario. The 2040 Constrained investment strategy achieves substantially greater benefits than the 2040 No Build, a 26% larger reduction in the burden of disease. Benefits from reduced air pollution accrue mostly in the first 10 years of the planning period, resulting in minimal additional benefits between 2027 and 2040.

The bulk of the health benefits from the proposed RTP are attributable to the reductions in air pollution. This is a departure from past studies and is a result of relatively small changes in total physical activity estimated by the travel model. Air pollution reductions are primarily driven by improvements in vehicle efficiency anticipated under current regulations, which is why health benefits are seen even in the No Build investment strategies. Health benefits from air quality could increase if vehicle emissions became further curtailed through regulation, infrastructure investment, or by faster than anticipated adoption of technologies such as electric vehicles. Similarly, health benefits

could be greater if additional pollution reductions occur outside of the transportation sector – changes not modeled for this measure.

Average per person weekly minutes of biking and walking

Description: The regional travel model estimates an average # of weekday miles traveled walking and biking per person. This is converted to an average weekly minutes per person spent walking or biking.

Target or desired direction: No target for this measure. The desired directions to increase weekly minutes of biking and walking, ideally to reach the recommended 150 minutes of moderate intensity physical activity.

Findings: As shown in **Table 7.36** the 2040 Constrained investment strategy increases weekly minutes of biking and walking per person to 59.4 minutes, compared to 48 minutes in the 2015 Base Year, a 24 percent increase. Though beneficial, the increase does not meet national guidelines, as published by the US Dept of Health & Human Services (2008), which recommend at least 150 minutes per week of moderate intensity physical activity.

Table 7.36 Average per person weekly minutes of biking and walking

	2015 Base Year	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Average per person weekly minutes walking	31.6	33.4	36.5	34.4	39.6	Not comparable
Average per person weekly minutes of biking	16.4	17.8	18.3	19.3	19.8	Not comparable
Total average per person weekly minutes of biking and walking	48	51.2	54.8	53.7	59.4	Not comparable

Estimated lives saved annually from increased physical activity and reduced air pollution

Description: For physical activity, ITHIM first converts time spent walking and biking into metabolic equivalent tasks (METs), a consistent unit of energy expenditure from exercise. For air pollution, the model uses average annual PM2.5 concentrations to estimate disease related to air pollution. The outputs of ITHIM are expressed as change in deaths and change in disability adjusted life years (DALYs).

Target or desired direction: No target for this measure. The desired directions to increase the number of lives saved and increase the number of years lived.

Findings: The burden of premature death and disease decreases under all investment strategies, with the 2040 Strategic investment strategy outperforming the 2040 Constrained in comparison to the 2040 No-Build Scenario. As detailed in **Table 7.36**, the 2040 Constrained Scenario achieves substantially greater benefits than the 2040 No Build, a 26% larger reduction in the burden of disease. Benefits from reduced air pollution accrue mostly in the first 10 years of the planning period, resulting in minimal additional benefits between 2027 and 2040.

Table 7.37 Estimated lives and years saved from increased physical activity and reduced mobile source air pollution

	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Estimated lives saved annually	15	17	19	22	Not comparable
Estimated Disability Adjusted Life Years (DALY)	209	260	272	354	Not comparable

Healthcare costs saved

Description: ITHIM uses a cost-of-illness approach consistent with the method used for the Climate Smart Strategy HIAs (Iroz-Elardo et al. 2014) and the US EPA (US EPA, 2007). This method uses large-scale studies of the cost of treating specific illnesses in the US and estimates the regional share of that cost. In this case, we used the CDC Chronic Disease Cost Calculator to arrive at estimates for direct (medical treatment) and indirect (absenteeism) costs of illness for the greater Portland region in 2027 and 2040. The Chronic Disease Cost Calculator does not provide estimates for specific cancers, nor for dementia. Therefore this method does not estimate avoided costs associated with dementia or cancer (lung, breast, and colon) even though it estimates the change in the burden of these diseases. This means that the total cost estimate is an underestimate. Consistent with methods from previous studies, it applies the population attributable fraction (percent change in DALYs from baseline) to arrive at an estimated change in treatment cost.

Target or desired direction: Lower healthcare costs

Findings: Over \$30 million in health care costs are avoided in the 2040 Constrained and 2040 Strategic investment strategies.

Table 7.38 Health care costs avoided (\$2017)

	2027 No Build	2027 Constrained	2040 No Build	2040 Constrained	Climate Smart Strategy
Annual health care costs saved	\$17 million	\$20 million	\$26 million	\$31 million	Not comparable

Note: Estimates rounded to the nearest million

2018 Regional Transportation Plan



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2018 Regional Transportation Plan

Chapter 8

Moving Forward Together

June 29, 2018

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PURPOSE

Metro is the metropolitan planning organization (MPO) designated by Congress and the State of Oregon, for the Oregon portion of the Portland-Vancouver urbanized area, serving 1.5 million people living in the region's 24 cities and three counties. As the MPO, Metro formally updates the Regional Transportation Plan every five years in cooperation and coordination with the Oregon Department of Transportation and the region's cities, counties and transit agencies.



Learn more about the 2018 Regional Transportation Plan at oregonmetro.gov/rtp

The Regional Transportation Plan is a blueprint to guide investments for all forms of travel – motor vehicle, transit, bicycle and walking – and the movement of goods and freight throughout the greater Portland region. The plan identifies current and future transportation needs, investments needed to meet those needs, and what funds the region expects to have available over the next 25 years to make those investments a reality.

Updates to the plan and subsequent implementation must meet the requirements of the federal Fixing America's Surface Transportation (FAST) Act, Oregon's Transportation Planning Rule (which implements Statewide Planning Goal 12), Oregon's Metropolitan Greenhouse Gas Emissions Reduction Targets Rule and Metro's Regional Framework Plan. In combination, these requirements call for development of a multimodal transportation system plan that is integrated with and supports implementation of local and regional land use plans and adopted Climate Smart Strategy, and meets federal, state and regional planning requirements.

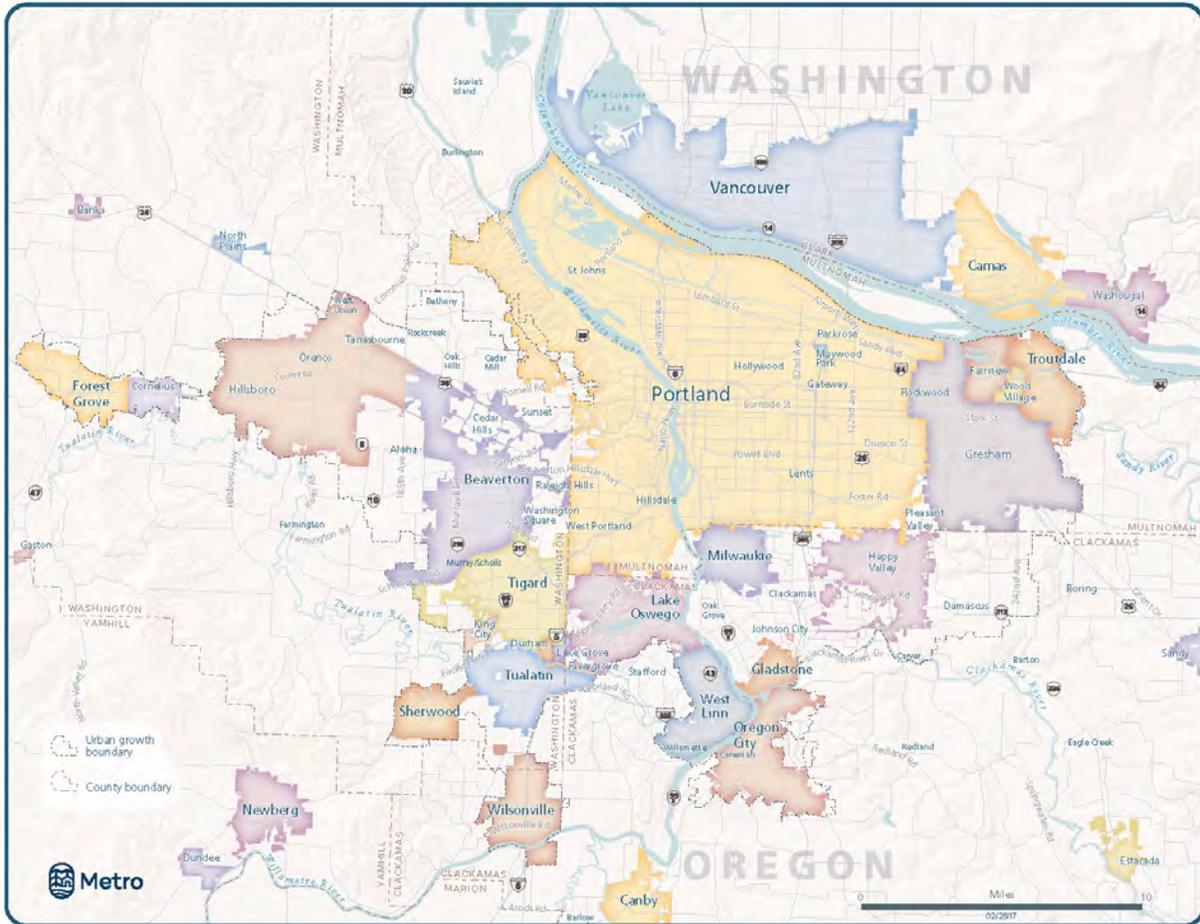
Chapter organization

This chapter summarizes future work to implement the RTP, consistent with federal, state and regional requirements.

The chapter is organized as follows:

- 8.1. Introduction:** This section summarizes the purpose and content of the chapter.
- 8.2. Planning and Programs:** This section summarizes local, regional and state planning and programs that advance implementation of the plan
- 8.3. Projects:** This section summarizes major project development activities and the allocation of federal transportation funds to implement projects in the RTP at the regional and state level
- 8.4. Amending the Plan:** This section summarizes the process for making revisions to the plan between scheduled updates.

8.5. Data and Tools: This section summarizes data and research activities to address existing and emerging planning and policy priorities and innovative practices in transportation planning and analysis and ensure that the region has the resources to fulfill its transportation performance measurement and reporting responsibilities.



Metro serves more than 1.5 million people in Clackamas, Multnomah and Washington counties. The agency’s boundary encompasses Portland, Oregon and 23 other cities – from the Columbia River in the north to the bend of the Willamette River near Wilsonville, and from the foothills of the Coast Range near Forest Grove to the banks of the Sandy River at Troutdale.

Among its other responsibilities, Metro is authorized by Congress and the State of Oregon to coordinate and plan investments in the transportation system for the three-county area. Metro uses this authority to expand transportation options, make the most of existing streets and improve public transit service. As the designated metropolitan planning organization, Metro works collaboratively with cities, counties and transportation agencies to decide how to invest federal highway and public transit funds within its service area. It creates a long-range transportation plan, leads efforts to expand the public transit system and helps make strategic use of a small subset of transportation funding that Congress sends directly to metropolitan planning organizations.

8.1 INTRODUCTION

Connecting Our Shared Values and Vision for the Future: Setting a Course for Transportation

Metro worked with federal, state and local government partners as well as residents, community groups, and businesses to develop the 2018 Regional Transportation Plan. The result of that work is a set of regionally identified goals and policies that guide our transportation planning and investment decisions overall, strategies to help meet those goals and policies, a shared understanding about existing financial resources, and a recommended set of projects that make progress addressing the region’s significant and growing transportation needs and challenges. The goals, policies, projects and strategies in this plan also address federal, state and regional planning requirements based on our shared values and the outcomes we are trying to achieve as a region.

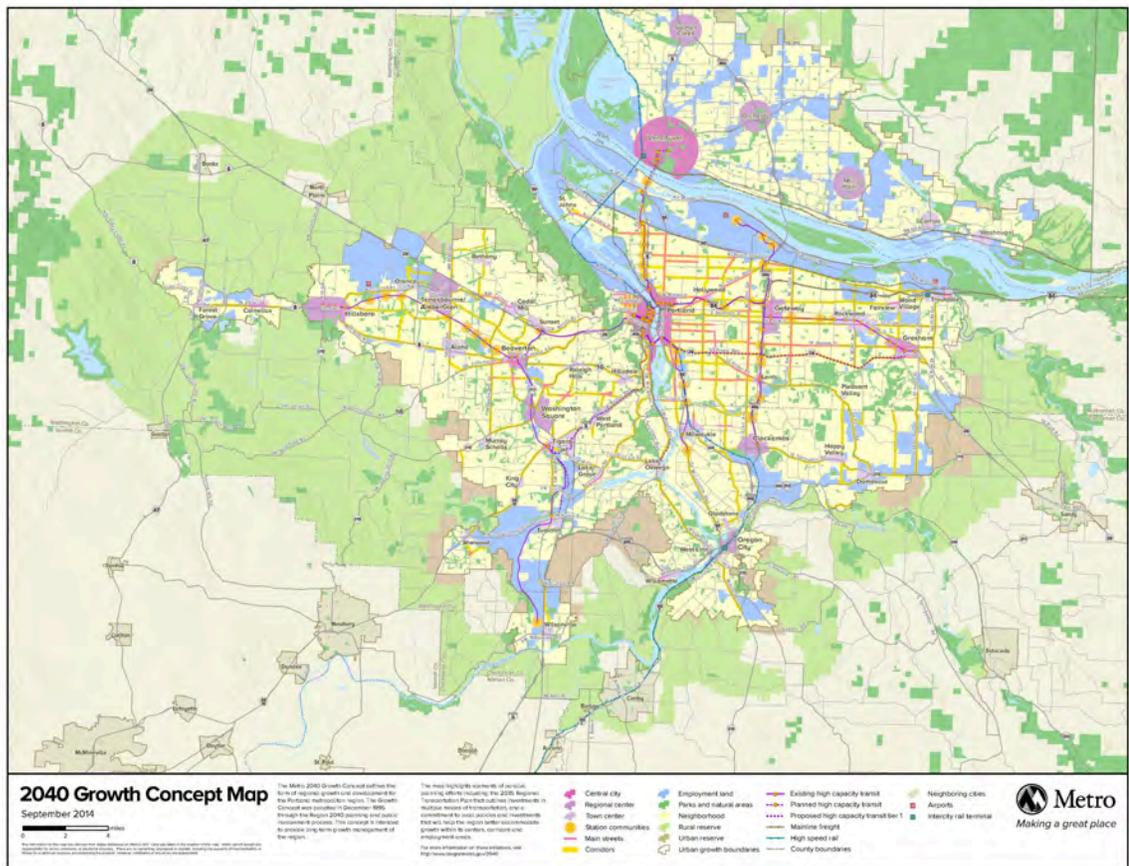


Figure 8.1 2040 Growth Concept (2014)

The 2018 Regional Transportation Plan is a key tool for implementing the 2040 Growth Concept – our shared land use and transportation strategy for managing growth

The plan sets an updated course for future transportation planning and investment decisions and continued implementation of the 2040 Growth Concept – the region’s adopted land use and transportation strategy for managing growth and building healthy, equitable communities and a strong economy.

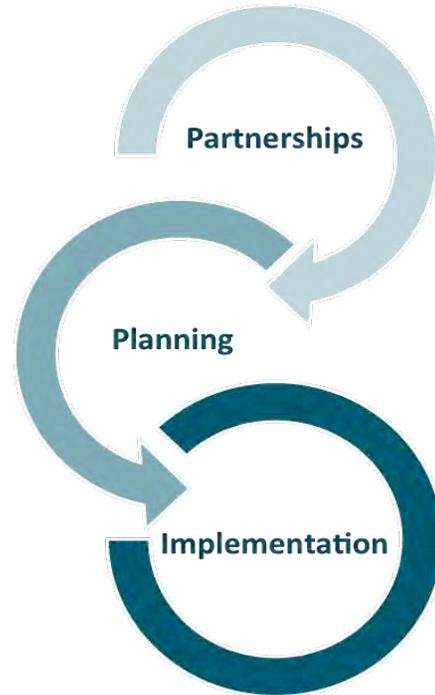
The plan takes into account the changing circumstances and challenges we face and addresses them directly, adopting new approaches for addressing safety, accessibility, mobility and transportation equity that distinguish this plan from past RTPs, and that align with existing funding challenges and opportunities.

Central to this plan are innovative approaches to connect community land use aspirations and transportation investments and use of regional mobility corridor strategies to comprehensively address our growing transportation needs. Each mobility corridor strategy is uniquely tailored by optimizing operations on existing throughways, and arterial streets that also serve as transit and freight routes, completing gaps in biking and walking connections and strategically expanding the transit and roadway system.

This RTP continues to broaden how performance of the system is measured to define system needs. This plan builds on the broader system completion policy adopted in 2010, adopting new accessibility, transportation equity and safety measures to evaluate performance of the investments recommended in this plan. These new measures will also be used to monitor how the transportation system is performing in between scheduled RTP updates.

Through its policies, projects and strategies, the RTP aims to attract jobs and diverse housing to our region’s downtown centers, main streets and employment areas. It seeks to increase the use of public transit, bicycling and walking, and reduce the amount of miles that our region’s residents, employers and visitors need to drive in order to get around. It also seeks to increase the safety, reliability and efficiency of the roadway and transit systems for all users. When we measure our performance, we find we have some successes, but overall the RTP falls short of meeting several performance targets set forth in Chapter 7.

To make more progress toward the goals and objectives of the plan, the region must take additional steps together and individually to address a wide range of planning, programmatic and project activities that will make it easier to implement adopted policies, projects and strategies. This chapter outlines those activities.



The plan will be implemented through a variety of policies, projects, strategies and actions at the local, regional, state and federal levels.

The plan will be implemented through a variety of strategies and actions at the local, regional, state and federal levels. The various jurisdictions in the region are expected to pursue policies, projects and strategies that contribute to meeting the agreed upon goals, objectives and policies of this RTP.

Implementation of this plan will require a cooperative effort by all jurisdictions responsible for transportation planning in the region, and will involve:

- Adoption of regional policies and strategies in local plans, including functional classifications for all modes and land use and transportation needs and agreed upon solutions identified in each mobility corridor strategy.
- A concerted regional effort to secure needed funding to build planned transportation investments needed to serve our growing and changing region.
- Focusing investments and system management strategies to support implementation of the 2040 Growth Concept and preserve the function of the region's mobility corridors in order to ensure that our land use and transportation policies are mutually supportive and make it easier for people to live and move around our region.
- Ongoing monitoring for consistency of changes to local transportation system plans (TSPs) and local Comprehensive Plans and land use designations with the RTP and other agency plans, including the Oregon Department of Transportation's Oregon Transportation Plan, Oregon Highway Plan and four-year State Transportation Improvement Program (STIP), the Oregon Department of Land Conservation and Development's Transportation Planning Rule (TPR), the Oregon Metropolitan Greenhouse Gas Emissions Reduction Rule and TriMet's Transit Implementation Plan (TIP).

The Regional Transportation Plan is a living document and will continue to evolve and be updated on a regular basis to address existing and emerging issues. Metro will continue to engage and collaborate with regional partners and stakeholders on all topics and provide support to ensure successful implementation of this plan.

8.2 PLANNING AND PROGRAMS

This section summarizes local, regional and state planning and programs that advance implementation of the plan and 2040 Growth Concept.

8.2.1 Local Implementation

Local planning efforts which help implement the Regional Transportation Plan, include updates to the local transportation system plans, concept plans for designated urban reserves and topical, modal or subarea plans needed for consistency with the RTP or to address specific local or subarea transportation needs or emerging issues.

Local plans and projects are developed and updated to meet local transportation needs consistent with local land use plans and to implement the RTP and Regional Transportation Functional Plan (RTFP) as well as local needs and priorities. The RTFP directs how city and county plans will implement the RTP through their respective comprehensive plans, local transportation system plans (TSPs) and land use regulations. All of the actions included in the RTFP will help the region proactively address climate change, improve access and mobility and support other desired outcomes.



The TPR includes provisions for local TSPs to be updated within one year of adoption of the updated RTP, but allows for the RTP to determine a schedule for local plan compliance. A schedule for local transportation system plan updates is available at www.oregonmetro.gov/tsp. The local plan updates are phased appropriately to support local desires for completing plan updates in a timely manner, in coordination with other planning efforts and to take advantage of state and regional funding opportunities. The schedule will be updated following adoption of the Regional Transportation Plan.

In addition, the Portland metropolitan region has emerging communities--areas that have been brought into the urban growth boundary since 1998, that have 2040 land use designations, and that lack adequate transportation and transit infrastructure and financing mechanisms. Additional work is needed to define the needs of emerging communities and strategies needed to facilitate development in these areas, consistent with the 2040 Growth Concept.

8.2.2 Metro's Regional Programs

Metro is responsible for several on-going regional programs that provide a combination of grants, technical assistance and planning to support local jurisdictions in implementing the 2040 Growth Concept and RTP. Modal experts provide expertise and support on freight, bicycle, pedestrian, motor vehicle, transit, Intelligent Transportation Systems (ITS) and operations planning, and topic experts provide support on climate change, equity, safety, emerging technology, shared mobility, connected and automated vehicles, street design, safe routes to school, resilience, transportation funding, brownfields, equitable housing and transit-oriented development. Metro's Regional Flexible Funds provide programmatic funding to help support that technical assistance, and capital funds to support implementation. The region's 2040 Grant Program supports planning processes to align land use and transportation goals, and the Equitable Housing grant program specifically focuses on supporting planning efforts to increase access to affordable housing across the region.

Regional programs identified in the Unified Planning Work Program, adopted annually by the Joint Policy Advisory Committee on Transportation (JPACT) and the Metro Council, are described below.

8.2.2.1 Civil Rights and Environmental Justice program

Metro's transportation planning policies and programs ensure compliance with Title VI of the 1964 Civil Rights Act; the Executive Order on Environmental Justice; Section 504 of the 1973 Rehabilitation Act and Title II of the 1990 Americans with Disabilities Act; Goal 1 of Oregon's Statewide Planning Goals and Guidelines; and Metro's organizational values of Respect and Public Service. The program is advancing methods on identifying potentially affected populations, engaging those populations in the development of policy and program decisions, and analyzing the effects of policies and programs for historically marginalized communities.

Metro's work to ensure compliance includes implementing outreach strategies that help marginalized populations overcome barriers to participation; demographic data collection and mapping; assessing outcomes of plans and programs on historically marginalized communities; and trainings provided to staff on Title VI compliance requirements and environmental outreach best practices.

Program work on compliance is found across many areas of transportation planning: developing the Regional Transportation Plan (RTP), the Metropolitan Transportation Improvement Program (MTIP); corridor planning projects that follow NEPA regulations and in the Regional Travel Options program, which conducts federally-funded outreach that promotes non-automobile transportation options. In 2012, Metro created a new public engagement review process, designed to ensure that Metro's public involvement is effective, reaches diverse audiences and harnesses emerging best practices. One of the three criteria for selection of members of the Public Engagement Review Committee, an

advisory committee to the Metro Council, is ability to represent diverse communities in the region. Other components of the public engagement review process that will contribute to more inclusive engagement and accountability include an annual public survey, meetings of public involvement staff from around the region to address best practices, an annual community summit to gather input on priorities and engagement techniques, and an annual report.

Metro addresses compliance agency-wide as well as within transportation planning functions and program-by-program. A key way that Metro complies across the agency is with implementation of its Diversity Action Plan, updated and adopted by the Metro Council in May 2017. The plan identifies goals, strategies and actions to increase diversity and cultural competence at Metro in four key areas: internal awareness and diversity sensitivity, employee recruitment and retention, committee membership and public involvement, and procurement. Metro's Strategic Plan to Advance Racial Equity, Diversity and Inclusion was adopted by the Metro Council in June 2016 and identifies goals and actions under five goals: Metro convenes and supports regional partners to advance racial equity; Metro meaningfully engages communities of color; Metro hires, trains and promotes a racially diverse workforce; Metro creates safe and welcoming services, programs and destinations; and Metro's resource allocation advances racial equity. Through the 2017-18 fiscal year, four departments are developing racial equity plans to reach the goals of the racial equity strategy: Planning and Development, Parks and Nature, Property and Environmental Services and the Oregon Zoo.

8.2.2.2 Regional Transportation Safety Program

Metro is formalizing regional transportation safety activities in a new Regional Safety Program to support Vision Zero and achieving federal, state, regional and local safety performance targets. The work program will be based on the strategies and actions identified in the 2018 Regional Transportation Safety Strategy and the Regional Safe Routes to School Program. Tasks in the Regional Transportation Safety Program work plan will annual reporting of federally mandated safety performance targets, annual reports to the Metro Council and JPACT, coordination with local, regional, state, and federal plans to ensure consistency in approach to safety needs and issues across the region, updates to regional plans and the Regional Transportation Functional Plan to reflect current policy direction, safety data collection, maintenance, analysis and interpretation, activities to coordinate with partners and increase awareness of Vision Zero and Safe Routes to School, encouraging best practices in transportation safety and roadway design with funding and programmatic support identifying legislative priorities, and collaborating on efforts to highlight safety in materials, messaging and campaigns. The program will be closely coordinated with other regional transportation programs and region-wide planning activities.

8.2.2.3 Regional Active Transportation Program

The Regional Active Transportation Program manages updates to and implementation of pedestrian, bicycle and access to transit in the Regional Transportation Plan (RTP) and the Regional Active Transportation Plan. The program provides guidance to jurisdictions in planning for safe, efficient and comfortable active transportation access and mobility on the regional transportation system (including regional trails and multi-use paths). The program is closely coordinated with other regional transportation programs and region-wide planning activities, and with Metro's Parks and Nature Department. Additionally, the program supports coordination with local, regional, state, and federal plans to ensure consistency in approach to active travel needs and issues across the region. The program ensures that prioritized regional bicycle and pedestrian projects are competitively considered within federal, state, and regional funding programs. Ongoing data collection, analysis, education, and stakeholder coordination are also key elements of Metro's active transportation program.

8.2.2.4 Regional Freight Program

The Regional Freight Program manages updates to and implementation of multimodal freight elements in the Regional Transportation Plan (RTP) and supporting Regional Freight Strategy. The program provides guidance to jurisdictions in planning for freight movement on the regional transportation system. The program supports coordination with local, regional, state, and federal plans to ensure consistency in approach to freight-related needs and issues across the region. Metro's coordination activities include ongoing participation in the Oregon Freight Advisory Committee (OFAC), and Portland Freight Committee (PFC). The program ensures that prioritized freight projects are competitively considered within federal, state, and regional funding programs. Ongoing freight data collection, analysis, education, and stakeholder coordination are also key elements of Metro's freight program. The program is closely coordinated with other regional transportation programs and region-wide planning activities.

8.2.2.5 Transportation System Management and Operations (TSMO) Program

With the intent of supporting TSMO investments and activities in the greater Portland metropolitan region, the TSMO program encompasses three activity areas that include regional policy development and implementation, MTIP grant management and system performance management:

- **Regional policy development and implementation.** The program maintains and periodically updates the Transportation System Management and Operations Strategy. The program provides leadership on the Regional Intelligent Transportation System (ITS) Architecture in order to comply with the FHWA rule that requires federally funded transportation projects to be in compliance with the National ITS Architecture. The program also guides implementation of the region's ITS communications network

under the Communications Master Plan. It will continue to seek and support opportunities for research, education, and training on TSMO.

- **MTIP Grant Management.** The program manages the allocation of Regional Flexible Funding dedicated to TSMO. The TSMO program coordinates projects that were prioritized for a sub-allocation of federal funds for 2016-2018 and 2018-2021, consistent with the adopted Regional TSMO strategy. The program will continue to coordinate and manage the allocation of TSMO-designated regional flexible funds to partner agencies. It will provide support for applying systems engineering to regionally-funded ITS projects.
- **Congestion Management Process Support.** The program supports the federal mandates to maintain a CMP and promote TSMO, including intelligent transportation systems (ITS). The program implements actions identified in the Arterial Performance Management Regional Concept of Traffic Operations (RCTO) to advance the region's performance measurement capabilities on arterial streets. CMP performance monitoring will continue (e.g., Regional Mobility Corridor Atlas) in order to support development of the RTP, local TSPs and MTIP programming. The program will continue to enhance PORTAL, a regional archived data user service managed by Portland State University. PORTAL will continue to expand the collection, archiving, and uses of multimodal performance data in a way that will enhance the region's ability to diagnose and address congestion and support multimodal operations consistent with the region's CMP.

The program is closely coordinated with other regional transportation programs and region-wide planning activities.

8.2.2.6 Regional Travel Options (RTO) and Safe Routes to School Programs

The Regional Travel Options Program implements RTP policies and the Regional Travel Options Strategy to reduce drive-alone auto trips and personal vehicle miles of travel and to increase use of travel options. The program improves mobility and reduces greenhouse gas emissions and air pollution by carrying out the travel demand management components of the RTP. The program maximizes investments in the transportation system and eases traffic congestion by managing travel demand, particularly during peak commute hours. Specific RTO strategies include promoting transit, shared trips, bicycling, walking, telecommuting and the Regional Safe Routes to School Program. The program is closely coordinated with other regional transportation programs and region-wide planning activities. The program is closely coordinated with other regional transportation programs and region-wide planning activities.

8.2.2.7 Air Quality and Climate Change Monitoring

The Air Quality and Climate Change Monitoring Program ensures the Regional Transportation Plan (RTP) and the Metropolitan Transportation Improvement Program (MTIP) address state and federal regulations and are carrying out the commitments and

rules set forth as part of the Portland Area State Implementation Plan (SIP), the Climate Smart Strategy and the Metropolitan Greenhouse Gas Emissions Reduction Target Rule. The program also coordinates with other air quality and climate change initiatives in the region.

8.2.2.8 Complete Streets Program

Metro's Complete Streets Program was established to provide transportation design guidelines, regional arterial and throughway design classifications and other tools to support local jurisdictions to design streets that implement context-sensitive design solutions that support the 2040 Growth Concept and achieving regional goals, including Vision Zero, increased transportation options for people of all ages and abilities, efficient and reliable travel for all modes, healthy people and environment, security, reduced greenhouse gas emissions, sustainable economic prosperity, racial and income equity, vibrant communities, resiliency and fiscal stewardship. Program elements include providing technical assistance to cities and counties as transportation projects go through project development and design, and convening workshops, forums and tours to increase understanding and utilization of best practices in transportation design. The program is closely coordinated with other regional transportation programs and region-wide planning activities, and with Metro's Parks and Nature Department.

8.2.2.9 Regional Transit-Oriented Development Program

Since 2001, Metro's Transit-Oriented Development (TOD) program has had a unique and critical role in implementing the 2040 Growth Concept vision for vibrant, walkable centers and station areas linked by transit. The program invests in compact mixed-use projects near light rail stations, along frequent service bus corridors and in regional and town centers throughout the region increasing opportunities for people live, work and shop in neighborhoods with easy access to high-quality transit. The program provides financial incentives for TOD projects to increase transit ridership, stimulate private development of mixed-use buildings that would otherwise not proceed, and increase affordable housing opportunities near transit in high cost and gentrifying neighborhoods through land acquisition and project investments. With an increased focus on affordable housing, the program supports construction of housing near transit and services that is more affordable for older adults and lower- and lower incomes households compared to what would otherwise be built on a property. Related program activities include opportunity site acquisition, investment in urban living infrastructure, and technical assistance to communities and developers.

8.2.2.10 Investment Areas Program

Metro's Investment Areas program helps communities build their downtowns, main streets and corridors and leverage public and private investments that implement the region's 2040 Growth Concept. Projects include supporting compact, transit oriented development in the region's mixed use areas, evaluating high capacity transit and other

transportation improvements that cross city and county lines, and integrating freight and active transportation projects into multimodal corridors.

Major public infrastructure investments do not stop at city or county lines. Our transportation system connects the communities within greater Portland with the rest of the state and the rest of the world. When our region spends billions of dollars on expanding our road, transit and highway system to keep up with the continued population and employment growth, those public investments can both benefit and burden nearby communities. Over time, the region has become more strategic at linking together our transportation, housing, economic, racial equity and environmental goals, policies, and investments so that we can intentionally preserve and create great places that serve all people throughout the region, even as change and growth occurs.

The Investment Areas program completes system planning and develops multimodal projects in transportation corridor refinement plans identified in the Regional Transportation Plan. It also works on finance plans to align public investments in areas that support the region's growth economy. It includes ongoing involvement in local and regional transit and roadway project conception, funding, and design. Metro provides assistance to local jurisdictions for the development of specific projects as well as corridor-based programs identified in the RTP.

Metro's Investment Areas program has been connecting the planning for major transportation projects with the community's broader goals and needs. While each area's conditions and needs are different, the approach of bringing together government, community, and business partners provides a framework to produce a shared plan of action to guide the investments and decisions of multiple agencies. Including a broader set of stakeholders in a collaborative decision making process allows for decisions that once seemed unclear or unfair to stakeholders to be more transparent. This approach improves our ability to involve and include those who are affected by these decisions and investments.

Investment areas can set the stage for a range of major capital investments beyond high capacity transit. Other Metro investment areas have focused on freight routes connecting major highways through small communities, redevelopment of brownfields in employment areas, and leveraging the opportunities of a regionally significant riverfront destination. The program is closely coordinated with other regional transportation programs and region-wide planning activities, including corridor refinement planning activities.

8.2.2.11 Emerging Technology Program

Metro's Emerging Technology program is new and will be guided by the Regional Emerging Technology Strategy. The Emerging Technology Strategy identifies steps that Metro and our partners can take to harness new developments in transportation technology—including automated, connected and electric vehicles; new mobility services

like car share, bike share and ride-hailing services (for example, Uber and Lyft); and the increasing amount of data available to both travelers and planners—to create a more equitable and livable greater Portland region and meet the goals in the 2018 Regional Transportation Plan.

The Strategy forecasts how technology is likely to impact transportation over the coming decades, discusses how transportation agencies can respond in an era of increasingly rapid change and identifies policies and actions that Metro and partners can take to stay on track to achieve our regional goals as technology continues to develop.

Metro has identified four **next steps** to take in the next two years that will advance the region’s work on emerging technology and support local partners in implementing the policies in the Strategy:

- Fund **technology pilot projects** to test new approaches to connecting people to transit, promoting shared and active trips and providing more equitable transportation options.
- Convene partners to establish **new mobility policies** that are consistent across the region and aligned with this strategy to ensure new travel options operate safely, equitably and transparently.
- Develop **better data and tools** so that we can account for the impacts of emerging technology in transportation planning efforts.
- Advocate for **state and federal technology policy that supports our regional goals** and preserves local and regional authority to manage the transportation system.

8.2.3 Region-wide Planning

This section summarizes near-term planning at the regional-scale to advance implementation of the plan. Each planning effort is needed to address regional transportation policy or planning issues that could not be resolved during the plan update.

These efforts will be completed consistent with the Regional Transportation Plan goals, policies and strategies. A lead agency, project partners and proposed timing for completion is identified for each planning effort along with a description of the issues to be addressed and expected outcomes from the work.

This work will be completed by multiple partners as resources are available and pending future Metro Council and JPACT policy direction.

8.2.3.1 Regional Mobility Policy Update

Lead agency	Partners	Proposed timing
Metro	ODOT, cities, counties, TriMet, SMART, FHWA, SW RTC	2019-20

As part of adopting the 2000 RTP, the first transportation plan to fully implement the Region 2040 Growth Concept, Metro developed a new approach to managing mobility. The new policy came from an extensive conversation with regional elected officials and policy makers over a two-year period, including an alternatives analysis to help officials better understand the tradeoffs with making mobility investments.

Originally adopted by JPACT and the Metro Council in 2000 and amended into the Oregon Highway Plan by the Oregon Transportation Commission in 2002, the interim regional mobility policy reflects a level of performance that regional policymakers and the Oregon Transportation Commission deemed acceptable at the time of its adoption. The policy was also recognized as an incremental step toward a more comprehensive set of measures that consider system performance, as well as financial, social equity, environmental and community impacts. The policy allows for more congestion during the peak period in locations that have good travel options available, such as high capacity transit, while aiming to protect the off-peak period for freight mobility.

The mobility policy broke from the historic practice of "one size fits all" congestion standards for roads and freeways to a more tailored approach that coordinates our region's land use goals with the role of our major streets, focuses auto and freight mobility expectations on the freeway system and emphasizes the role of transportation choices in moving people throughout the region. This new emphasis on a tailored mobility policy and multimodal solutions was also incorporated into the Oregon Transportation Plan (OTP) in 2006, the policy document that frames and organizes all of the state's modal plans for transportation.

The policy also recognizes that past practice of "building your way out" of peak-hour highway congestion is not only fiscally and technically unattainable, but also has unintended impacts that are inconsistent with the adopted 2040 Growth Concept vision, including encouraging development on rural lands outside the urban growth boundary and undermining the broader public and private investments being made in centers and transit corridors. The policy prioritizes investment in a multimodal transportation system in order to make sure that our transportation investments also help us meet our economic development, public health, climate change and fiscal responsibility goals.

In the 2010 RTP, Metro expanded on the concept with the development of a series of regional mobility corridors that provide the geography for monitoring and reporting on mobility. Twenty-four mobility corridors, encompassing the entirety of the region's transportation system, were developed, with each corridor framed by Region 2040 land use outcomes, and bundling throughways, transit, arterial streets and bikeways in each

mobility corridor as complementary parts of an integrated system. Metro publishes a periodic Regional Mobility Atlas to provide ongoing tracking of these corridors as a foundation for planning and project development work in the region.

In 2013, ODOT published the Corridor Bottleneck Operations Study (CBOS), another tool for understanding and responding to congestion bottlenecks on throughways within the regional mobility corridors. This tool has since been used to prioritize system management and operational investments on the region's throughways system with an eye toward fine-tuning a mature throughway system with strategic capacity improvements. The few major throughway projects envisioned in the RTP are focused on bottlenecks that are part of this shift toward maintaining, managing and operating a mature system.

Despite these efforts to keep pace with traffic growth in the region, congestion has continued to grow since the 2000 RTP mobility policy was adopted. During this time, the region has experienced significant population and employment growth, straining all parts of our transportation system. During the same period, state investments in the region's freeway system continued to decline from historic levels due to slowing state and federal transportation funding.

ODOT's 2016 Traffic Performance Report¹ shows what many of us have experienced: traffic congestion in the greater Portland region today can occur at any time of the day or week, and is no longer only a weekday peak hour problem. In 2013, about 11 percent of all travel in the greater Portland region occurred during congested periods. This increased to nearly 14 percent in 2015. This increase in congestion is a reflection of the both the region's continued growth, including our substantial economic rebound from the Great Recession that began in 2008.

More recently, the U.S. Department of Transportation issued new regulations (through MAP-21 and the FAST Act) for states and MPOs that will require greater monitoring of mobility on our throughway 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 better address growing congestion on the region's throughway system, ODOT and Metro propose to work in partnership on a refinement plan to update the regional mobility policy upon completion of the 2018 RTP. 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 and demand management and investments in the region's mobility corridors.

¹ The 2016 Traffic Performance Report establishes a baseline for long-term monitoring that will help Metro and ODOT better understand the performance of the region's freeway system and supports the

This work is expected to take 2 years and will produce two major policy refinements for consideration by JPACT, the Metro Council and the Oregon Transportation Commission.

Expected outcomes of the update include:

- A corridor-specific mobility strategy will be developed for the National Highway System for the purpose of meeting federal requirements, and because the NHS generally corresponds to the interstate and statewide highway system defined in the Oregon Highway Plan (OHP). This strategy will be incorporated into the RTP and Oregon Highway Plan (OHP).
- 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 will be developed and incorporated into the RTP.

Together, these new policy frameworks will guide system development as part of future RTP updates and the development of city and county Transportation System Plans (TSPs) and the region’s ongoing Congestion Management Process (CMP).

8.2.3.2 Regional Congestion Pricing Technical Analysis

Lead agency	Partners	Proposed timing
Metro and ODOT	Cities, counties, FHWA	2019-TBD

Growing congestion on the greater Portland area’s throughways is increasing travel delays and unpredictability. This congestion affects quality of life as travelers sit in cars or on the bus, and impacts the economy through delayed movement of merchandise and lost productivity.

Ongoing efforts to address congestion in the region include investments in system and demand management strategies, improving transit service and reliability, increasing bicycle and pedestrian access and adding highway capacity in targeted ways. But it is clear that these strategies are not sufficient, and will result in continued congestion in our region. We cannot address congestion through supply alone; we must also manage demand.

Through the end of 2018, ODOT is conducting a feasibility analysis to explore the options available and determine how value pricing, also know as congestion pricing, could help ease congestion in the greater Portland area.

Oregon’s House Bill 2017, also known as Keep Oregon Moving, directs the Oregon Transportation Commission to develop a proposal for value pricing on I-5 and I-205 from the state line to the junction of the two freeways just south of Tualatin, to reduce congestion. The State Legislature directed the OTC to seek approval from the Federal Highway Administration no later than December 31, 2018. If FHWA approves the proposal, the OTC is required to implement value pricing.

The OTC formed a policy advisory committee in fall 2017 to provide a recommendation after considering technical findings, likely effects (traffic operations, diversion, equity, environmental and air quality, and others), mitigation opportunities and public input. This work is focused on identifying potential strategies to manage demand on I-205 and I-5. In its early stages, it has focused attention on the need to price comprehensively, rather than High Occupancy Toll lanes and to identify key mitigation strategies, such as increased transit service.

The project’s limited scope has raised larger questions about how demand management pricing strategies could be implemented throughout the region; further study is needed in this area and should be undertaken to better understand different ways that pricing could work regionally and the different policy outcomes each scenario would create. This should include an analysis of the potential importance and role of increased transit service and the mutual benefits congestion pricing and expanded transit service can bring depending on the type of pricing strategy and transit service implemented. A comprehensive, regional study should be undertaken before the next update to the RTP in order to provide policy guidance as to how to most effectively implement pricing to reduce congestion and improve the overall function of the transportation system.

8.2.3.3 Transportation System Management and Operations Strategy Update

Lead agency	Partners	Proposed timing
Metro	Cities, counties, ODOT, TriMet, SMART, C-TRAN, RTC, FHWA	2019-20

The region’s Transportation System Management and Operations (TSMO) program follows a 10-year plan that ends in 2020. Consequently, the Metro will update the TSMO Strategy before it expires, and to reflect the changing transportation technology-driven infrastructure and system needs.

The strategy will be adopted as an appendix to the RTP when the update is complete. The TSMO Strategy will guide program investments using federal funding allocated by Metro through the Regional Flexible Fund Allocation process, state funding, additional federal grant funds and local funds, building on investments to increase transportation system efficiency and support innovative ways to use technology to actively manage demand, manage the system and to improve operations, such as building on the foundation of the region’s Intelligent Transportation Systems (ITS) investments. The TSMO Strategy will include key components of the system monitoring, performance measurement and the federally-required Congestion Management Process (CMP) defined in the RTP. Most of the required CMP activities are related to performance measurement and monitoring.

While the current TSMO plan continues to serve the region, an update is needed to formalize new concepts among regional TSMO partners, including systems, operations and infrastructure for connected and automated vehicles following policy defined in the region’s Emerging Technology Strategy. TSMO planning and systems support smarter

operations through integrated corridor management, decision support systems, cloud-based applications and “Smart City” urban applications of the Internet-of-Things (IoT) in service of sensing real-time demand to improve operations.

The update will engage a broad range of stakeholders to understand issues and needs from operators and the traveling public. It will focus on empowering local and regional jurisdictions to analyze multimodal performance data to advance the region’s ability to diagnose and manage congestion, support multimodal operations, reduce climate and other emissions and improve safety to achieve Vision Zero. The update will also include planning for next generation transit signal priority to improve transit travel time reliability and speeds system-wide. The update will result in an updated set of policies, projects and specific actions to guide TSMO investments and activities in the greater Portland region and further implement the Regional Transportation Plan.

8.2.3.4 Jurisdictional Transfer Assessment Program

Lead agency	Partners	Proposed timing
Metro and ODOT	Cities, counties, TriMet, FHWA	2019-20

Purpose

The purpose of a jurisdictional highway transfer assessment program is to identify which state-owned routes in the Portland metropolitan region should be evaluated and considered for a jurisdictional transfer, identify gaps and deficiencies on those routes, to regionally prioritize the routes, and address some of the barriers and opportunities to transfer the prioritized routes from state ownership to local ownership.

Problem Statement

In Oregon, and specifically in the Portland metropolitan region, ownership patterns of streets, roads and highways reflect historical patterns but do not necessarily reflect current transportation uses, land use and development patterns. While many of the state-owned roads with an arterial classification carry freight, they also serve short distance local vehicle trips, transit, bicycle, and pedestrian travel. A road under Oregon Department of Transportation (ODOT) jurisdiction that no longer fulfills its original role in the context of the larger state highway system may be a very important route to the city or county where it is located in the context of the local and regional system. These roadways can be found throughout the region: from Hall Boulevard to the west, McLoughlin Boulevard to the south, Powell Boulevard to the east and Lombard Street to the north.

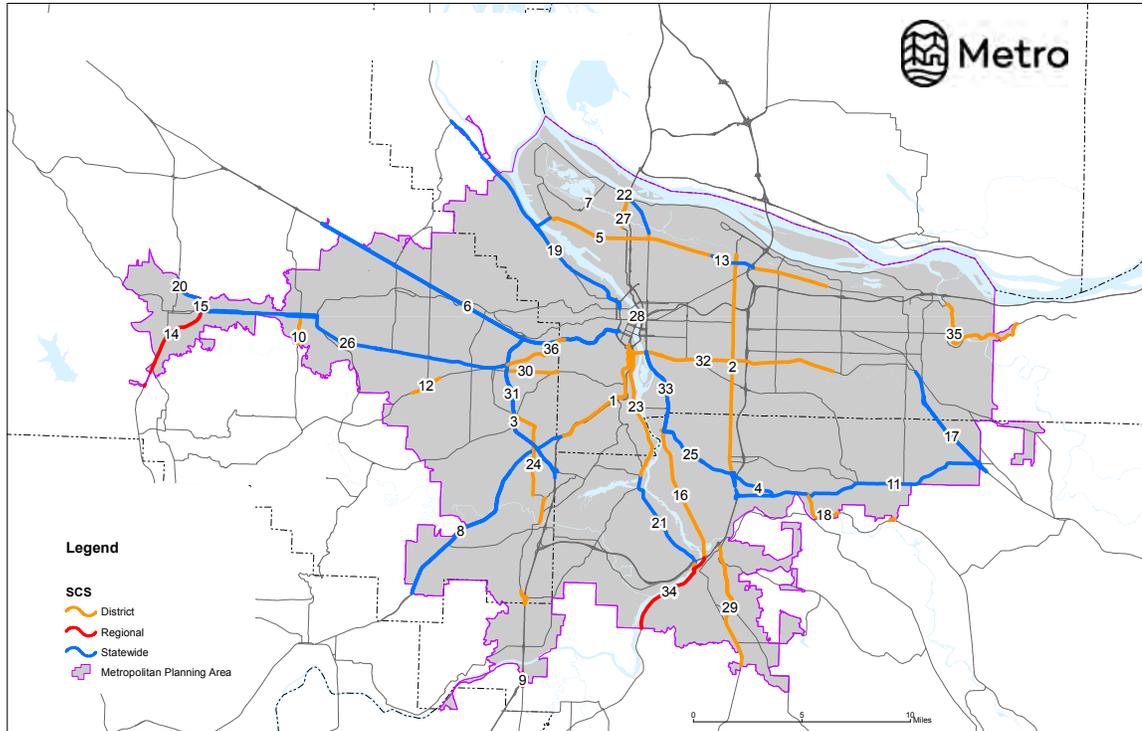


Figure 8.2 Oregon Highway Plan State Highway Classifications

The history of each road also provides important context for decision-making. Sometimes called an "orphan highway," many roadways in the Portland metropolitan region were originally constructed as rural or farm-to-market roads. But as city limits expanded many of these roads became surrounded by increasingly dense urban environments that put pressure on them to function more as city streets. Due to increased commercial activity and access over time, these arterial highways now serve more of an accessibility than a mobility function, and often carry multiple modes of transportation each day. For example, 82nd Avenue is a major transit and pedestrian corridor. In 1983, Interstate 205 opened just 10 blocks east, creating a new north-south throughway. At this point, 82nd Avenue was no longer needed for long-distance travel.

In the Regional Transportation Plan (RTP), these roadways are often identified as key travel corridors for freight, transit, vehicle, bicycle and pedestrian trips. There is a strong correlation between the 2018 RTP High Injury Network, where road users face higher than average probability of being killed or seriously injured, and arterial highways. It is a regionally recognized issue: how to balance mobility and reliability for all modes with accessibility, safety and livability. Maintaining these roads and implementing capital improvements is further complicated when local expectations and needs do not match state investment priorities.

According to the Oregon Highway Plan (OHP) Policy 2C (Interjurisdictional Transfers), it is the policy of the State of Oregon to consider jurisdictional transfers that rationalize and

simplify management responsibilities, reflect the appropriate functional classification, and lead to increased efficiencies in the operation and maintenance of a particular roadway segment or corridor. ODOT's *A Handbook for Making Jurisdictional Transfers* reiterates that it is in ODOT's interest to concentrate state responsibility for the road system on highways with statewide or inter-regional significance and to increase the efficiency of operation and maintenance of the highway system.²

Most of these roadways have a backlog of pavement maintenance as well as gaps or deficiencies in basic urban pedestrian and bicycle facilities. Funding for near- or long-term investments has not been identified by the state or local jurisdictions. Furthermore, there is no agreement in the region on which roads are the highest priorities when it comes to what to transfer, when, and at what cost.

Process

Metro will work with ODOT to lead a collaborative and inclusive process for decision-making to prioritize highways and address some of the next steps for transfer in the Portland region. Because Metro does not own any roadways, Metro will act as a facilitator and convener of partners to move the process forward.

While this process aims to assess and prioritize roadways for transfer in the Portland region, it is not intended to discourage any transfers from occurring prior or during the assessment process. There are certain roadways and jurisdictions that may be ready for a transfer without going through this assessment process.

Jurisdictional Transfer Assessment Program Process

STEP 1: Identify roadways in the Portland region that might be candidates for jurisdictional transfer

STEP 2: Compile existing data

STEP 3: Evaluate costs and local readiness of corridors

STEP 4: Prioritize roadways for jurisdictional transfer in the Portland region

STEP 5: Identify risk issues and legal mechanisms for Tier 1 corridors

STEP 1: Identify roadways in the Portland region that might be candidates for jurisdictional transfer

The first step is a planning phase that necessitates Metro, ODOT and their partners to take a look at classifications in the context of today's transportation system, or what is planned in future investments.

Metro, ODOT and local jurisdictions (the project partners) will identify the state-owned roadways to be included in the study, including most arterials but excluding throughways. The map below displays the State Highway Classifications for all state-owned roads in the region. Action 2C.1 of the Oregon Highway Plan (OHP) suggests that potential candidates for jurisdictional transfer may include: urban arterials serving primarily local travel

² Transferring Roads: A Handbook for Making Jurisdictional Transfers (2003) can be accessed online at: <https://digital.osl.state.or.us/islandora/object/osl%3A9571/datastream/OBJ/view>

needs; urban streets that have remained state-owned after a parallel major improvement has been constructed; frontage roads; farm-to-market roads; other roads that function like county roads; and connector roadways between highways.

Road classifications will be used to determine the highways to review. The starting assumption is that:

- “Interstate Highways” will not be included.
- Roads owned by the state and classified as “Regional” or “District” will be included on the list of potential roadways for jurisdictional transfer.
- Roads owned by the state and classified as “Statewide” will be evaluated on a case-by-case basis according to existing and planned function, as defined in the OHP. In cases where a reclassification of the highway from Statewide to Regional or District is warranted, changes to the OHP may be sought before considering jurisdictional transfer.

The “Statewide” classification will likely require the most analysis and discussion. According to the OHP, the “Statewide” classification is defined as providing “inter-urban and inter-regional mobility and to provide connections... not served by Interstate Highways” and “the management objective is to provide a safe and efficient, high-speed, continuous-flow operation.” These criteria will be used for determining which Statewide Highways remain in the classification and which should be reclassified as District or Regional.

In addition, the designations of state classifications have not been updated since the adoption of the OHP in 1999. The process for reconsideration will take into account National Highway System (NHS) and other freight-related designations that have been updated more recently. More research is needed if and how NHS designations affect a potential transfer. The RTP also provides a means to revisit the Statewide Highway classification, as the RTP already differentiates facilities with the OHP classification and the regional functional classification system. Those facilities that are designed as (or planned to include) limited-access, high-speed routes (per the OHP definition of Statewide Highways) are part of the RTP Principal Arterial network. Examples include the Sunset Highway, Highway 217 and Highway 99E/224/Sunrise.

Once roadways are identified, partners will also assess whether the current conditions of the highway are consistent with the RTP and local TSP design and modal classifications, local land use plans, past planning efforts, and submittals of projects to the RTP project list.

The potential roadways vary in length and often cross multiple jurisdictions. Since local jurisdictions are the likely recipients of the transferred highway, it is proposed to define segments, and beginning and end points based on jurisdictional boundaries.

STEP 2: Compile existing data

In the second step, data sources will be identified and cataloged at the corridor segment level to identify infrastructure gaps and deficiencies.

Below is a list of potential criteria and data sources that could inform this step in the process:

- **Safety score**
 - Evaluation of crash data and relation to the High Injury Network/High Crash Network identified in the RTP and/or ODOT's SPIS process.
 - Resources: ODOT crash data, Metro Regional Transportation Safety Strategy, Metro State of Transportation Safety Report, ODOT Region 1 SPIS Analysis
- **Asset score**
 - Evaluation of pavement conditions, may also take into account status of other assets on roadways, such as signals.
 - Resources: ODOT pavement rankings, TSMO/ITS evaluation
- **Pedestrian network completeness score**
 - Evaluation of gaps in the pedestrian network and ADA network. Analysis may include crossings.
 - Resources: ODOT Region 1 Active Transportation Needs Inventory and Metro Regional Active Transportation Network
- **Transit score**
 - Evaluate whether existing or planned frequent service route, Verify whether transit reliability is an issue. Determine whether it may be designated for Enhanced Transit.
 - Resources: Enhancement Plans from transit providers, and Metro Regional Transit Strategy

These scores will be used to assess deficiencies will be the starting point for the analysis in Step 4. In the next step, a consideration of equity could be used to further prioritize the roadways.

STEP 3: Evaluate costs and local readiness of corridors

Step 3 is a pivotal step to move toward improvements on identified roadways. The partners involved in a potential transfer must be ready for transfer and come to an agreement on how to assess the costs of transfer. Costs to bring the highway up to a state of good repair will be estimated for corridors, based on the analysis done in Step 2. The cost assessment will take into account maintenance needs, signals, pavement condition, pedestrian and transit needs and, if applicable, safety needs. Transfer recipients may want

to develop cost estimate ranges for long term investments that would be implemented after a transfer is complete.

Second, partners will consider likely timeframes to complete repairs and transfers. It may not make sense for the state to upgrade a roadway if the recipient jurisdiction has near-term plans to make significant improvements that would result in rework.

STEP 4: Prioritize roadways for jurisdictional transfer in the Portland region

In Step 4, the partners will prioritize the corridors for transfer, further narrowing the number of corridors to be considered for transfer.

The project partners will review the data compiled in Step 2 and the cost information in Step 3, and use that information to rank priority corridors in the region. For example, the safety score could be considered the most urgent factor. The pavement condition score is a strong indicator of how much repair needs to be done. Based on initial feedback from partners, the roads could be tiered based on safety and pavement ratings.

Based on the agreed-upon criteria, the roadway or roadway segments will be divided in three tiers:

- Tier 1: Highest priority roadways for transfer
- Tier 2: Medium priority roadways for transfer
- Tier 3: Lowest priority roadways for transfer

The roadways in Tier 1 will be further analyzed in Step 5. Equity is also a criterion that should be taken into account as applicable in the ranking process and could move a roadway up or down a tier. Equity focus areas are defined in Metro's Regional Transportation Plan, reflecting areas of the region with the highest concentrations of people of color, people with low income and/or people with limited English proficiency.

STEP 5: Identify risk issues and legal mechanisms for Tier 1 corridors

The purpose of Step 5 is to identify and understand that liability and risk issues involved in a transfer, and learn from successful transfers. Project partners will consult with the Office of Metro Attorney, and solicit input from partner's attorneys, such as the DOJ, to document any liability and legal issues for consideration during a potential transfer.

Metro will summarize ODOT's requirements as set forth in the Handbook for making Jurisdictional Transfers, and document best practices from past transfers that have been successful. Examples include inner Sandy Blvd. MLK Blvd., and portions of Hall Blvd. and Farmington Road.

Conclusion

These steps will help prepare the region, local governments and the state to identify priorities and readiness. The process will not commit funding sources, but it will help project partners identify roadways that are good candidates for transfer, expected cost ranges to fund state of good repair improvements, cost ranges to fund additional improvements and potential funding sources and timelines.

Note: This process does not include decision-making on whether improvements on these roadways should be made before or after a jurisdictional transfer. Those decisions are context-sensitive and may be best determined based on the corridor and the partners involved.

8.2.3.5 Transit Planning

Lead agency	Partners	Timing
TriMet and SMART	Cities, counties, Ride Connection, other transit providers	Annually

The TriMet and SMART (South Metro Area Regional Transit) conduct annual transit service planning in coordination with Metro, cities, counties and other transit providers to implement the RTP, Regional Transit Strategy, Coordinated Transportation Plan for Seniors and People with Disabilities, TriMet Service Enhancement Plans and the SMART Master Plan. One of the key themes of this RTP is the need for more transit capital investment and service, in order to provide more of our region with safe, convenient, reliable, and affordable transit options and prioritize roadway capacity for freight mobility and trips that do not have functional alternatives.

In July 2017, the Oregon Legislature passed House Bill 2017, also known as the Keep Oregon Moving bill. This historic piece of legislation was the largest transportation bill passed by the Oregon Legislature in many years. Among the many transportation investments in the bill is a statewide investment in public transportation. This investment is funded by a 0.1% payroll tax on all employee salaries in the state. This will result in approximately \$50+ million in funds for TriMet in FY20. The bill requires TriMet to develop a plan in conjunction with a citizen's advisory committee for improving public transit. The legislation specifically calls out the following projects as examples of what could be funded:

- Expansion of transit service frequency, hours, and coverage, especially to low income communities;
- Implementation of a fare mitigation program for low income communities;
- Purchase of zero carbon emitting vehicles via compressed natural gas or electricity;
- Improved connections between communities inside and outside transit district boundaries;

- School transportation for grades 9-12 equaling 1 percent of total funding.
- Light rail construction was called out as ineligible for HB 2017 funding.

TriMet’s HB 2017 Transit Advisory Committee has been meeting to develop a plan for the funding since October 2017. TriMet and the committee have been engaged in an outreach process that has included an online survey and five public workshops throughout the region to better understand how the community would like to see the transit system improved. TriMet contracted with the Immigrant Refugee Community Organization (IRCO) to design, promote and facilitate the public workshops. Workshops are being held throughout the region, with extra outreach conducted to communities of color, youth, seniors, immigrants, and people with disabilities. TriMet and the advisory committee must complete their work in the fall of 2018.

8.2.3.6 Enhanced Transit Concept (ETC) Pilot Program

Lead agency	Partners	Proposed timing
Metro and TriMet	ODOT, cities, counties, SMART	2018-22

This is a critical time in our region to consider how transit fits into our larger regional goals. As our region deals with significant population and employment growth, we must turn to more efficient modes of moving people around in order to ensure that our freeway system meets a basic level of mobility necessary for freight movement. The Climate Smart Strategy, adopted by JPACT and the Metro Council in 2014, provided clear direction to invest more in our transit system in order to meet regional goals and objectives related to sustainability and carbon emissions.

Recent, current and future growth rates require us to expand transit service to provide people with attractive transportation options while minimizing congestion. Significant and coordinated investment is needed to continue providing today’s level of transit service as our region grows. Increasing transit service will require dedicated funding, policies, and coordination from all jurisdictions. Improving transit also helps the region meet its equity and access goals as it is a primary mode of transportation for the elderly, people with disabilities, and youth, providing them with a way to get to work, school, and attain access to daily needs. Transit will become even more critical as our region’s population ages. In order to make transit a more attractive mode in a quick timeframe with limited financial resources, the region is rolling out a new tool box of “enhanced transit concepts” which are implemented quickly and lead to faster, more reliable transit service.

To meet the greater Portland region’s environmental, economic, livability and equity goals today and as we grow over the next several decades, new partnerships are needed to deliver transit service that provides increased capacity and reliability yet is relatively low-cost to construct, context-sensitive, and able to be deployed quickly throughout the region where needed. Producing “Enhanced Transit,” through the co-investment of multiple partners could be a major improvement over existing service such as our region’s existing

and future Frequent Service bus lines, but less capital-intensive and more quickly implemented than larger scale high capacity transit projects the region has built to date. Investments serve our many rapidly growing mixed-use centers and corridors and employment areas that demand a higher level of transit service but may not be good candidates for light rail, or bus rapid transit with fully dedicated lanes at this time.

Goals of the ETC pilot program are:

- Increase transit ridership to a level that will be sufficient to meet regional and local mode split goals by improving transit reliability, speed, and capacity through hotspot bottleneck locations in congested corridors and throughout the region. This will be accomplished through moderate capital and operational investments from both local jurisdictions and transit agencies.
- Identify, design and build a set of Enhanced Transit projects, either to relieve hotspot bottlenecks or across whole congested corridors or in partnership with local jurisdictions and facility owners where improvements are most needed and can be deployed quickly to produce immediate results.
- Develop a pipeline of Enhanced Transit projects so they are ready to advance forward to construction as jurisdictions identify funding.

On October 2017, JPACT authorized utilization of bond proceed revenue of \$5 million to support the funding of the Enhanced Transit Concept Pilot Program. The program will support the development of ETC projects and build partnerships between transit agencies and jurisdictions to implement improvements quickly.

ETC can include regional scale, corridor scale, and/or spot-specific improvements that enhance the speed and reliability for buses or streetcar. The table below lists the different types of treatments appropriate for each scale.

Enhanced Transit Concept Workshops

The ETC Pilot Program is focusing on hotspot improvements that can be implemented quickly on frequent service lines that are experiencing the most reliability issues. As part of the pilot program, Metro and TriMet held a series of 14 workshops, between January and April 2018, to identify where and what kind of ETC treatments could be implemented. Each workshop looked at 3-5 roadway segments or hotspots across the region where existing and future frequent service bus lines have the highest ridership and are experiencing the most congestion and reliability issues. These hotspots were reviewed with local partners and potential ETC treatments were recommended to understand feasibility and project readiness based on context and local jurisdictional partner input.

Metro issued the Request for Interest (RFI) in May of 2018 and received a total of 38 ETC applications, demonstrating significant interest from regional partners. The applications built upon the series of workshops conducted with regional partners earlier in the year. Within the ETC applications, 49 individual projects were identified. While the pilot

program has \$5 million to spend, the total value of requested design services is estimated to be between \$15 million and \$20 million.

Projects received through the RFI process will be evaluated based on their readiness, transit need and potential benefit. ETC projects will include concept design, traffic analysis and transit benefit depending on the transit need and potential improvement. A portion of these projects will continue through project development, design and construction.

8.2.3.7 Central City Transit Capacity and Steel Bridge Analysis

Lead agency	Partners	Proposed timing
Metro and TriMet	ODOT, city of Portland, Portland Streetcar, Inc., FTA	TBD

This study would explore ways to alleviate transit operational issues caused by the Steel Bridge. As the critical link between downtown Portland and the east side of the greater Portland region for the Blue, Green, Red, and Yellow MAX Lines, as well as for several bus routes, the 106 year old bridge constrains light rail throughput, requires frequent maintenance that impacts system-wide light rail reliability, and presents structural risks. The Steel Bridge with its current two-track configuration cannot reliably accommodate anticipated growth in service.

Preliminary analysis by TriMet identified more than 20 concepts that were consolidated into representative alternatives and evaluated to understand the potential benefits and drawbacks, While TriMet will consider a full range of options at the start of any formal project, initial study suggests that two concepts appear most promising:

- a new transit bridge south of and parallel to the Steel Bridge
- a transit tunnel between Lloyd Center station and Goose Hollow station

Current issues

Capacity and travel time

Today, transit on-time performance around the Steel Bridge does not meet TriMet's 90 percent target. TriMet is in the process of making a \$12 million investment in the Steel Bridge to improve travel times and address system reliability issues. Some projects have already been completed resulting in fewer delays for TriMet riders. However, with the tight headways required to accommodate additional trains, on-time performance could fall to 55 percent in 2040 and minor delays could impact the entire system.

Conflicting train and traffic movements

The ability to get trains across the Steel Bridge is about more than just capacity on the bridge itself. The traffic signal on the bridge's east side at North Interstate Avenue impacts light rail operations. Though light rail trains can preempt vehicular traffic at the signal, trains often must wait while the pedestrian cycle clears. At both the bridge's west and east

approaches, signals are located at the same place as track switches leading to delay from conflicting train movements as well as vehicles.

Operational and structural risks

Light rail operations on the Steel Bridge are complex and pose risks to TriMet. The bridge, built in 1912, would not likely survive a major earthquake. Even without a natural disaster, the bridge requires maintenance as it ages and bridge loads increase. The bridge is a unique link for all light rail lines and if the bridge is closed for any reason it would create system-wide operational challenges. Further, the bridge is owned by Union Pacific Railroad and any structural or seismic changes to the bridge would need to be approved by Union Pacific Railroad.

Long-Term Improvement Concepts

A new transit bridge option: A new transit bridge south of the Steel Bridge would include four light rail tracks. Station locations would remain as they are today. It would increase system ridership by 3,000 riders and decrease travel time by approximately two minutes. Planning of a new bridge would need to consider navigational clearance, structure type, and approach locations and bridge uses. The bridge would cost an estimated \$300-650 million (\$2017) without right-of-way or utility relocation.

A new tunnel option: A tunnel would extend from the vicinity of the Lloyd Center Station to the Goose Hollow Station, with approximately four underground stations in between. TriMet would retain some service on the existing surface alignment to continue to serve all stations. The tunnel would increase system ridership by 7,500 to 15,200 riders and decrease travel time by approximately 15 minutes between Lloyd Center and Goose Hollow, while improving system resiliency and redundancy. Planning of a tunnel would need to evaluate the locations of portals and determine the optimal number and locations of stations. Estimated cost is \$900 million to 1.94 billion(\$2017) without right-of-way or utility relocation.

With either project, reconfiguration at the Rose Quarter and the west approaches to the Steel Bridge could create opportunities to support redevelopment in concert with other anticipated projects in the area. Either concept would represent a long-term project requiring a formal planning and impact assessment compliant with the National Environmental Policy Act (NEPA). Such assessment would include a funding strategy, development on a timeline for implementation, stakeholder engagement and coordination and study of alternatives.

8.2.3.8 Transportation Equity Analysis and Monitoring

Lead agency	Partners	Proposed timing
Metro	Cities, counties, ODOT, TriMet, SMART, community organizations	2019-23

The 2018 RTP transportation equity analysis identified the need for improved data to inform future planning and decision-making. The improved data will help develop a disparities baseline of communities of color and lower-income communities in terms of access, affordability, safety, and environmental health outcomes. Information about the disparities these communities experience will help to facilitate ongoing monitoring and evaluation of how transportation projects are making progress towards implementing regional goals and objectives regarding transportation equity, accessibility, affordability, and safety.

The disparities baseline should include an in-depth existing conditions analysis which would be disaggregated by demographic characteristics, with a particular focus on different dimensions of accessibility, affordability (see H + T expenditure tool described in section 5 – Data and Research), safety, and environmental health outcomes, such as localized air pollution exposure.

8.2.3.9 Funding Strategy for Regional Bridges

Lead agency	Partners	Proposed timing
Counties	Cities, Metro, ODOT, TriMet	2019-21

The region continues to struggle with a long-term strategy for maintaining major bridges that serve regional travel, particularly local bridges spanning the Willamette River. Currently, Multnomah County has primary responsibility for five of the ten bridges. Within 20 years, four of Multnomah County’s five Willamette River Bridges will be 100 years old. The county’s capital program for these bridges is estimated to cost \$450 million, yet only \$144 million in federal, state and county revenues has been identified. All the region's bridges face maintenance challenges that come from age and use.

More collaboration and work is needed to develop a financial plan for ensuring ongoing operations and maintenance and other transportation needs of regional bridges, given the regional economic importance of keeping the Willamette River Bridges and other regional bridges fully functional in the long-term.

8.2.3.10 Emergency Transportation Routes Project

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

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

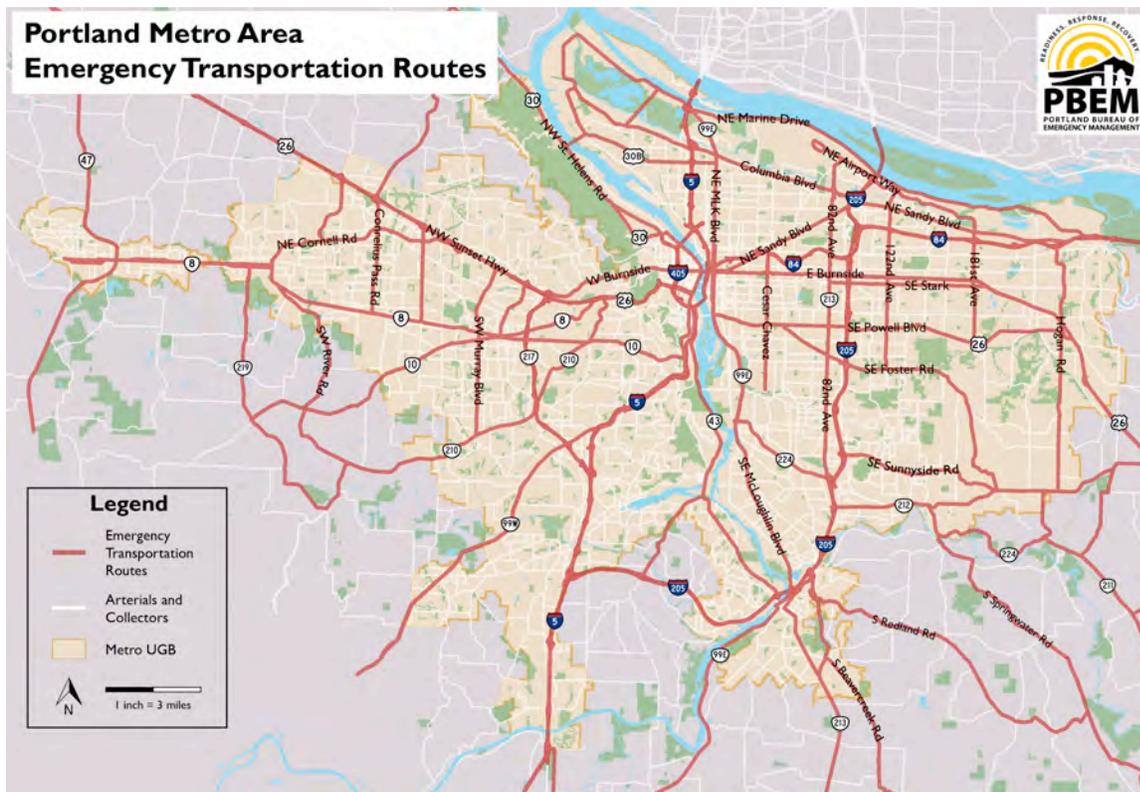


Figure 8.3 Designated Regional Emergency Transportation Routes (2006)

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

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

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

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

Expected outcomes of the project include:

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

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

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

8.2.3.11 Regional Freight Delay and Commodities Movement Study

Lead agency	Partners	Proposed timing
Metro and ODOT	Cities, counties, Port of Portland, FHWA	2022

As a critical West Coast domestic hub and international gateway for commerce, the greater Portland area must maintain well-functioning river ports, rail connections and highways. ODOT completed the Freight Highway Bottlenecks Project in March of 2017, which identified locations on Oregon’s highway network that are experiencing significant freight truck delay, unreliability, and increased transportation costs. The ODOT project showed that the greater Portland area has the bulk of the identified freight delay areas in Oregon. Based on ODOT’s work, the Regional Transportation Plan and Regional Freight Strategy identify a small set of key highway bottlenecks on National Highway System facilities critical to state and regional truck mobility. The RTP and Regional Freight Strategy also note freight rail bottlenecks impacting critical access the region’s ports and intermodal facilities, as well as the need for rail to efficiently carry its full share of existing and future commodities.

The Regional Freight Strategy identified this study to address these long-standing rail and truck bottlenecks and increase understanding of their economic importance to the region. The study would evaluate the level of commodity movement on the regional freight network within each of the mobility corridors identified in the Regional Mobility Corridor Atlas. The study would use Metro’s new freight model to evaluate the general types of commodities, the tonnage of the commodities and the value of the commodities that are using the regional freight network within each of region’s mobility corridors. The study would also evaluate the need for improved access and mobility to and from regional industrial lands and intermodal facilities. The Regional Mobility Policy update described in Section 8.2.3.1 will establish a policy foundation for this work.

Potential outcomes of the study include:

- 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 would inform freight project priorities for the next RTP (due in 2023) and Regional Freight Strategy.

8.2.3.12 Regional Freight Rail Study

Lead agency	Partners	Proposed timing
Metro and Port of Portland	Cities, counties, ODOT	2023

Identified in the Regional Freight Strategy, this study would seek to identify and produce increases in rail capacity, safety, land use compatibility and operational efficiencies to support freight and goods movement in the region which is important to our long-term economic and environmental sustainability, and will help to maintain the region's competitive advantage in a global marketplace.

Potential outcomes of the study include:

- 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:
 - An updated list of regional freight rail project priorities focused on improving capacity constraints and targeting industrial access to the rail networks.
 - A strategy to fund regional freight/passenger rail bottlenecks.
 - A strategy to fund needed grade separations.
 - A strategy to fund critical modernization projects on the short rail lines.

8.2.3.13 Regional Transportation Functional Plan Update

Lead agency	Partners	Proposed timing
Metro	Cities, counties, ODOT, DLCD, TriMet, SMART	TBD

Since the adoption of the 2040 Growth Concept in 1995, cities and counties across the region have updated their comprehensive plans, development regulations and transportation system plans to implement the 2040 Growth Concept in locally tailored ways. The Regional Transportation Plan provides a long-range blueprint for implementing the transportation element of the 2040 Growth Concept and presents the overarching vision, policies and goals, system concepts for all modes of travel and strategies for funding and local implementation for the region. Projects submitted to the Regional Transportation Plan are from adopted local, regional or state planning efforts that provided opportunities for public input. Cities and counties are responsible for creating transportation system plans that are periodically updated to stay consistent with the Regional Transportation Plan and reflect local transportation priorities and needs. Each city and county develops its own process for engaging the public in the development of the plans.

Most communities throughout the region have an adopted transportation system plan that serves as the transportation element of a comprehensive plan consistent with the Regional Transportation Functional Plan (RTFP). The functional plan implements the goals, objectives and the policies of the Regional Transportation Plan and its constituent strategies, including the Climate Smart Strategy and strategies for safety, freight, transit, transportation system management and operations, regional travel options and emerging technology.

Under state law, the RTFP directs cities and counties within the metropolitan planning area boundary as to how to implement the Regional Transportation Plan through local transportation system plans and associated land use regulations and transportation project development. Local implementation of the RTP will result in a more comprehensive approach for implementing the 2040 Growth Concept, help communities achieve their aspirations for growth and support current and future efforts to achieve the goals and objectives of the RTP.

A targeted review and update is needed to:

- ensure the functional plan language and provisions are consistent with and adequately reflect new and updated goals, objectives and policies adopted in the 2018 Regional Transportation, with a focus on safety, equity, transit, and freight;
- make miscellaneous technical corrections and clarifications, such as outdated references to maps and figures in the 2010 Regional Transportation Plan; and
- update the timeline for local TSPs updates.

8.2.3.14 Parking Management Policy Update

Lead agency	Partners	Proposed timing
Metro	Cities, counties, ODOT, TriMet, SMART	TBD

Parking management refers to various policies and programs that result in more efficient use of parking resources. Managing parking works best when used in a complementary fashion with other strategies; it is less effective in areas where transit or bicycle and pedestrian infrastructure is lacking. Parking management is implemented through locally-adopted zoning and development codes.

This update is needed because current regional parking requirements were adopted more than 20 years ago and, despite minor updates, they are out of date in terms of where they are applied and the amount of parking to be provided. Some of the factors affecting parking include: presence of high capacity transit, presence (or absence) of frequent bus service as well as infrastructure supporting bicycling and walking in an area and population and employment density of an area.

The region needs to be prepared to consider parking management programs as a tool to meet greenhouse gas emissions reduction, transportation demand management and stormwater management goals. New parking management approaches may be required as a tool to effectively reduce greenhouse gas emissions and the region needs to know more about the effect of different approaches on emissions to inform policy development.

New 'smart' technologies and other approaches to financing and managing parking may be available. The region may be missing new applications or technologies that can facilitate parking management and would benefit from a quick survey of best practices.

8.2.3.15 Green Corridor Implementation

Lead agency	Partners	Proposed timing
Metro	Cities, counties, ODOT	TBD

Green corridors were adopted as part of the 2040 Growth Concept in 1995. The purpose of green corridors is to prevent unintended urban development along these often heavily traveled routes, and maintain the sense of separation that exists between neighbor cities and the greater Portland region. The green corridor concept calls for a combination of access management and physical improvements to limit the effects of urban travel on the routes on adjacent rural activities. Following adoption of the 2040 Growth Concept, Metro worked with the cities of North Plains, Canby and Sandy from 1998-2000 to develop intergovernmental agreements (IGAs) but did not formalize these agreements. This remains as an outstanding issue in fully implementing the Growth Concept.

In 2010 and 2011, the elected governing bodies of Clackamas, Multnomah and Washington counties and Metro entered into agreements that determine the location and scale of urban development for the future. These agreements were the result of a two-year region-

wide planning effort that identified areas for future urban use and other areas that should remain rural for the next 40 to 50 years. The urban and rural reserve decision provides a more certain framework for transportation improvements along the urban edge. Metro will work with interested local jurisdictions to complete IGAs for green corridors that reflect updated plans for urban and rural reserves.

8.2.4 Corridor Refinement Planning

This section identifies areas in the region – called mobility corridors - that are recommended for more detailed refinement planning to identify multimodal investment strategies adequate to serve regional transportation needs in the corridor.³

This RTP calls for an update to the region’s mobility policy and related performance targets beginning in 2019, and is expected to affect corridor refinement planning identified in this section. Many of the areas identified for refinement planning in the RTP are identified because they do not meet the adopted regional mobility policy. Individual corridor refinement planning descriptions have been updated to reflect work remaining and are being carried forward in this RTP pending recommendations and findings from the Regional Mobility Policy Update. JPACT and the Metro Council will provide further policy direction on the Mobility Policy Update in 2019.

Corridor Refinement Planning and the Transportation Planning Rule

Corridor refinement planning is a response to the Oregon Transportation Planning Rule (TPR). Section 660-012-0020 of the TPR requires that transportation system plans (TSPs) establish a coordinated network of planned transportation facilities adequate to serve regional transportation needs. The RTP is the region’s TSP. Section 660-012-0025 of the TPR allows jurisdictions to defer decisions regarding mode, function, and general location of improvements to address identified needs as long as it can be demonstrated that the refinement effort will be completed in the near future.

A corridor refinement plan must identify the capital and operational improvements that a mobility corridor needs consistent with the region’s congestion management process. This is particularly critical for planning efforts that may result in significant expansion of roadways beyond the planned system. A CMP analysis is required for capacity-increasing projects that go beyond the planned RTP system before federal funds may be applied. For such projects, the CMP looks at road expansions beyond the planned system as a last resort and, as appropriate, requires that they be coupled with complementary operational and travel demand management strategies.

³ Twenty-four subareas of the region – called mobility corridors - have been identified in the RTP. Each mobility corridor is defined by the designated 2040 Growth Concept land uses that are connected by an integrated system of throughways, arterial streets, transit and freight routes, and regional pedestrian and bike networks located within the subarea.

In the Portland region, in order to stay consistent with our regional transportation and land use goals, our corridor refinement process includes a multimodal look at transportation needs, as well as a review of existing and planned land use and projected growth. See Section 8.5.4 and Appendix L for more information about the region's CMP.

A corridor refinement plan includes the following steps:

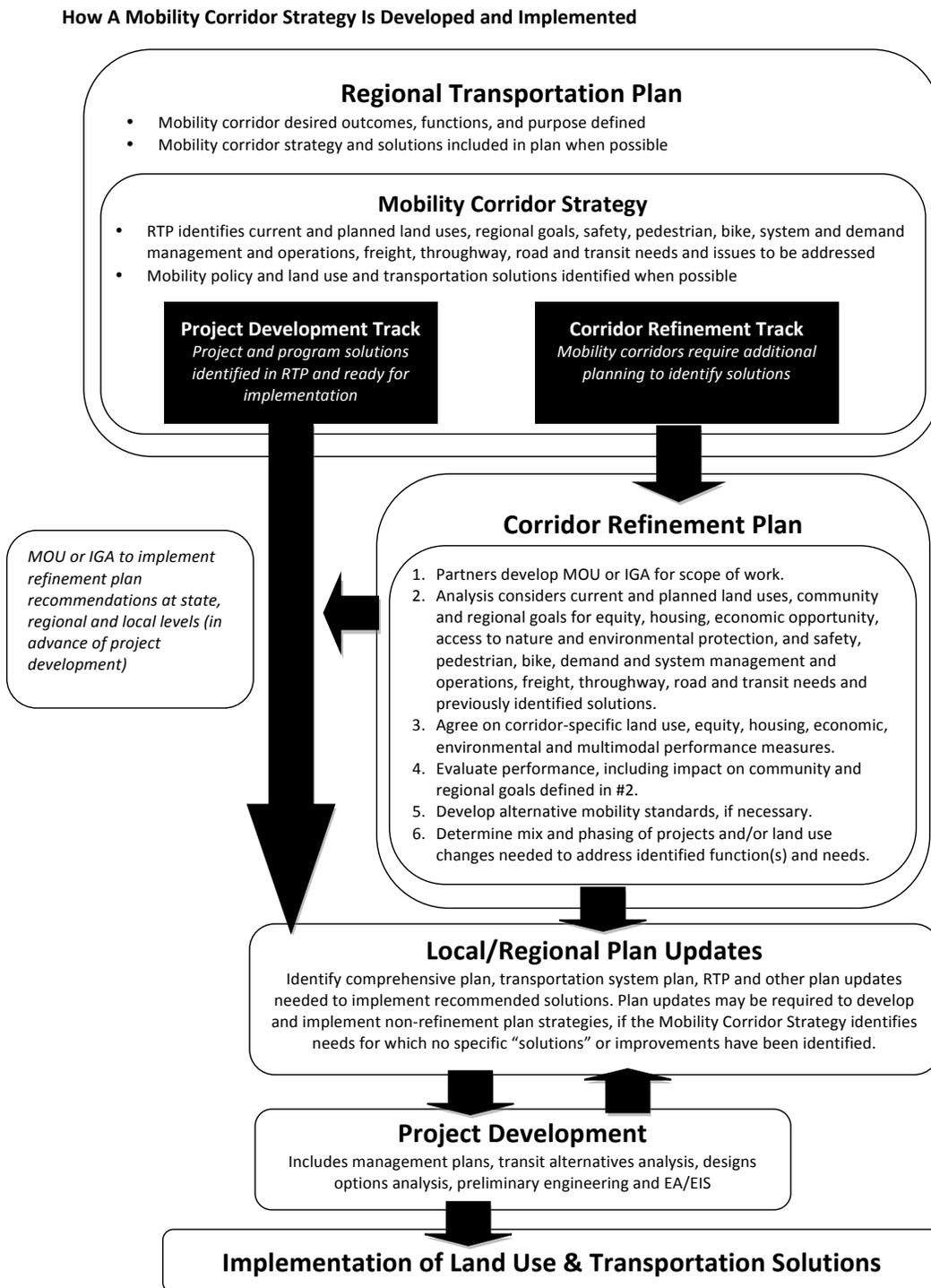
1. **Develop MOU or IGA** for refinement plan scope of work that includes identification of roles and responsibilities, methods of collaboration and consultation with Metro, if the refinement planning work is not led by Metro.
2. **Conduct analysis** that considers current and planned local land uses, regional and community goals for equity, housing, economic opportunity and environmental protection, and safety, pedestrian, bike, system and demand management and operational strategies, freight, throughway, road and transit needs and previously identified solutions.
3. **Agree on corridor specific multimodal performance measures.**
4. **Evaluate multimodal performance** and potential impact on regional and community goals for equity, economic development and environmental protection; and, if applicable, apply HCT system expansion assessment and readiness criteria.
5. **Develop alternative mobility or other performance standards**, if necessary.
6. **Determine mix and phasing of projects and/or land use changes** needed to address identified needs.
7. **Prepare local, regional and/or state plan amendments and MOU or IGA to implement** refinement plan recommendations at state, regional and local levels.

Consistent with the region's congestion management process, corridor refinement plans will provide decision-makers with more comprehensive information regarding safety, accessibility, mobility, reliability and congestion as they relate to the movement of persons and goods in the mobility corridor and consider land use, economic opportunity, equity, travel demand and system management, street connectivity, walking and biking solutions in addition to increasing transit and road capacity. The corridor refinement plan will recommend a wide range of strategies and projects to be implemented at the local, regional and/or state levels.

Individual project and program solutions identified in the RTP may move forward to project development at the discretion of the facility owner/operator. Planning and project development efforts should be conducted with an understanding of the corridor refinement planning anticipated in the RTP and not preclude any strategies or potential solutions identified for consideration in the corridor refinement plan. The MOU or IGA from a corridor refinement plan is intended to provide more accountability and to formalize agreements across implementing jurisdictions on moving forward to implement

the corridor refinement plan recommendations. This is particularly important in mobility corridors with multiple jurisdictions. **Figure 8.5** shows the framework for how the mobility corridor strategy will be incorporated into the RTP or developed through a corridor refinement plan.

Figure 8.4 How A Mobility Corridor Strategy Is Developed and Implemented



Mobility Corridors Recommended for Future Corridor Refinement Plans

The main objective of the RTP mobility corridor framework is to organize information needed to help define the need, mode, function, performance standards, and general location of facilities within each mobility corridor consistent with the Transportation Planning Rule to ensure land use and transportation planning and decision-making are integrated. The needs assessment was developed based on the RTP policy framework and guided the identification of projects and programs during development of the RTP.

Under the mobility corridor framework, when determinations of need(s), mode(s), function(s), and general location(s) of solutions cannot be made, the mobility corridor needs a refinement plan. Corridor refinement plans are intended to be multimodal evaluations of possible land use and transportation solutions to address identified needs and develop a shared investment strategy, consistent with RTP goals, objectives and policies. This includes conducting an evaluation that considers the potential impact on regional and community goals for equity, housing, economic development, environmental protection and access to nature.

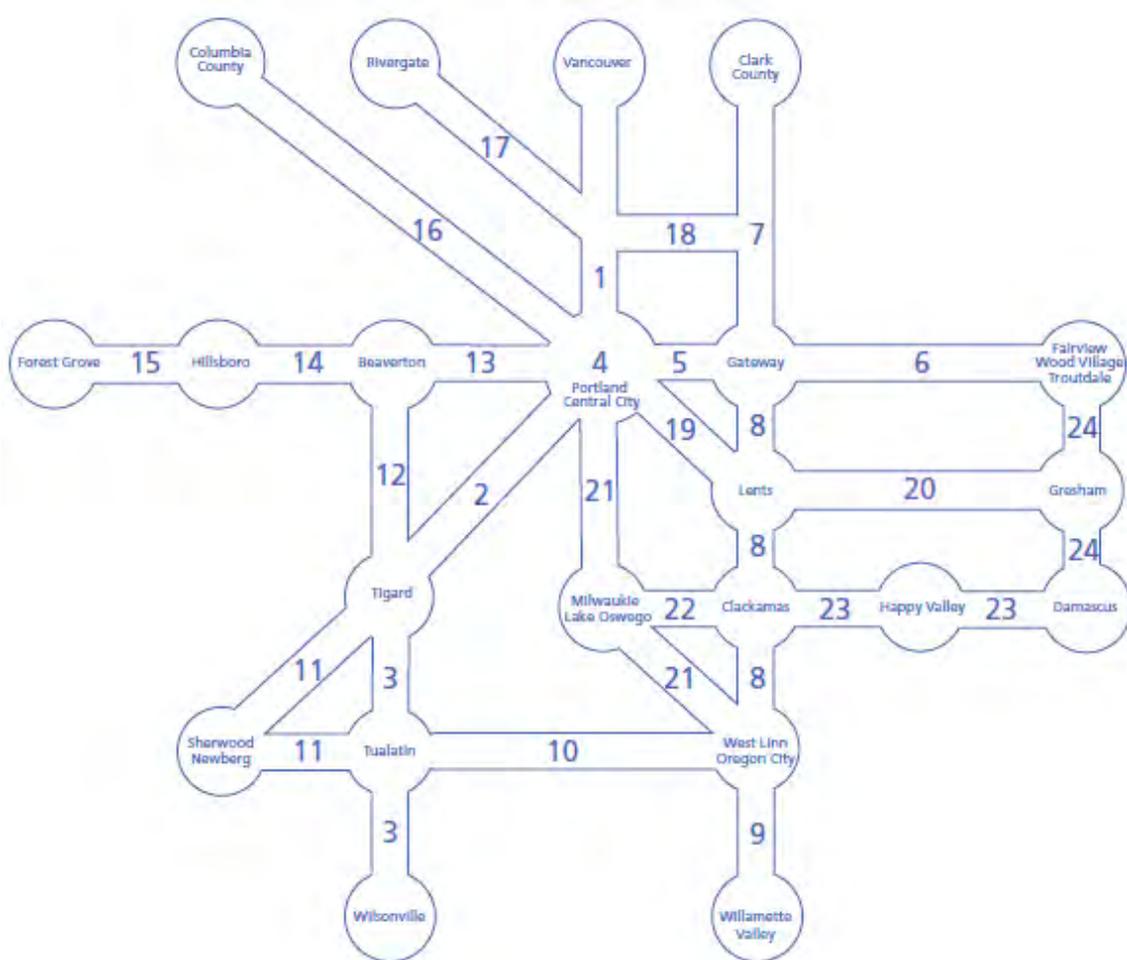
The RTP has identified a list of mobility corridors that do not meet the outcomes-based performance standards of the RTP and/or do not fully answer questions of mode, function and general location. These corridors need refinement planning and are listed in **Table 8.1**. The corridors are not listed in priority order. In addition, potential high capacity transit corridors identified in the Regional Transit Strategy are likely to require corridor refinement plans to develop shared land use and transportation investment strategies and determine transit mode, function, general location and any associated changes in road or freight rail functions and performance standards of existing transportation facilities. The Regional Mobility Policy update described in Section 8.2.3.1 will establish an updated policy foundation for this work.

Table 8.1 Mobility Corridors Recommended for Future Corridor Refinement Planning

Regional Mobility Corridor	General Geographic Scope of Mobility Corridor
Mobility Corridors # #3	Tigard to Wilsonville which includes I-5 South ⁴
Mobility Corridor #4	Portland Central City Loop, which includes I-5/I-405 Loop
Mobility Corridors #7, #8 and #9	Clark County to I-5 via Gateway, Oregon City and Tualatin, which includes I-205
Mobility Corridor #14 and #15	Beaverton to Forest Grove, which includes Tualatin Valley Highway
Mobility Corridors #13, #14 and #16	Hillsboro to Portland, which includes US 26 and US 30
Mobility Corridors #19 and #20	Portland Central City to Lents and Lents to Gresham, which includes US 26/Powell Boulevard
Mobility Corridor #24	Clackamas to Fairview/Wood Village/Troutdale, which includes OR 212 and Sunrise Corridor

⁴ In coordination with project development activities for Mobility Corridor #10.

Figure 8.5 Illustrative Map of Mobility Corridors in the Portland Metropolitan Region



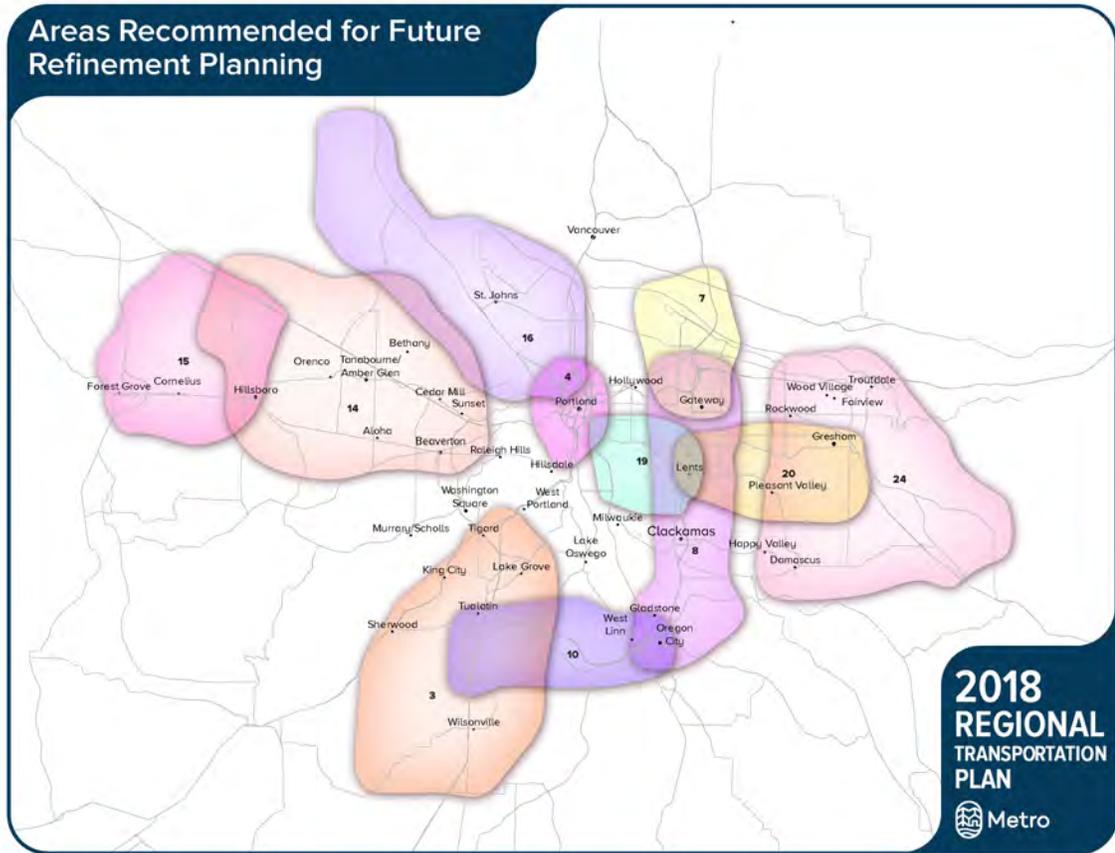
Corridor Refinement Plans that have been partially completed since 2014

- Portland Central City Loop (Mobility Corridor #4)
- Tualatin Valley Highway Corridor Plan (Beaverton to Forest Grove - Mobility Corridor #14 and 15)

Corridor refinement plans that have been completed since 2014

- Southwest Corridor Plan and Shared Investment Strategy (Portland central city/Southwest Portland, Tigard, Durham, King City, Tualatin, Sherwood, east Beaverton, small portion of west Lake Oswego – Mobility Corridor #2)
- East Metro Connections Plan (Gresham/Fairview/Wood Village/Troutdale to Damascus – Mobility Corridor #24)

Figure 8.6 Regional Mobility Corridors Recommended for Future Refinement Planning



8.2.4.1 Tigard to Wilsonville (Mobility Corridor #3)

This mobility corridor provides the major southern access to and from the central city. The corridor also provides important freight access, where Willamette Valley traffic enters the region at the Wilsonville “gateway,” and provides access to Washington County via OR 217.

In 2002, a joint ODOT and Wilsonville study⁵ concluded that in 2030 widening of I-5 to eight lanes would be required to meet Oregon Highway Plan and RTP mobility standards, and that freeway access capacity would not be adequate with an improved I-5/Wilsonville Road interchange. The appropriate improvements in this corridor are unclear at this time. However, I-5 serves as a critical gateway for regional travel and commerce, and an acceptable transportation strategy in this corridor has statewide significance. Projections for I-5 indicate that growth in traffic between the Metro region and the Willamette Valley will account for as much as 80 percent of the traffic volume along the southern portion of I-5, in the Tualatin and Wilsonville area.

Graphic illustrating geographic extent of mobility corridor to be developed during the public comment period and added to the final RTP.

In 2017-2018, ODOT and the City of Wilsonville partnered on a Southbound I-5 Boone Bridge Congestion Study. They evaluated and developed solutions for a southbound bottleneck in the bridge area, in order to manage congestion and reliability for private vehicles, freight, and transit in the evening peak. This geographically focused study was timed to identify operational improvements in advance of upcoming seismic rehabilitation of the Boone Bridge, so that they could proceed as one project and allow the state to reduce total costs. The study led to the adoption (anticipated July 2018) of the I-5 Wilsonville Facility Plan, which documented a southbound auxiliary lane concept consistent with implementation recommendations for this corridor (see Project 11990 on the 2018 RTP Financially Constrained List). It did not preclude a larger I-5 south corridor refinement plan, and many of the broader multimodal needs in this corridor still need to be addressed.

A corridor refinement plan is proposed to address the following in coordination with project development activities for Mobility Corridor #10:

- Effects of widening I-205 on the I-5 South corridor.
- Effects of the I-5 to 99W Connector study recommendations on the N. Wilsonville interchange and the resultant need for increased freeway access.

⁵I-5/Wilsonville Freeway Access Study, DKS Associates, November 2002

- Effects of peak period and mid-day congestion in this area on regional freight reliability, mobility and travel patterns.
- Ability of inter-city transit service, to/from neighboring cities in the Willamette Valley, including commuter rail, to slow traffic growth in the I-5 corridor.
- Ability to maintain off-peak freight mobility with capacity improvements.
- Potential for better coordination between the Metro region and Willamette Valley jurisdictions on land-use policies.
- Effects of a planned long-term strategy for managing increased travel along I-5 in the Willamette Valley.
- Effects of UGB expansion and Industrial Lands Evaluation studies on regional freight mobility.
- Effects to freight mobility and local circulation due to diminished freeway access capacity in the I-5/Wilsonville corridor.
- Identify and implement safety and modernization improvements to I-5 defined by the Tigard to Wilsonville Corridor Refinement Plan.
- I-5/OR217 Interchange Phase 2: SB OR217/Kruse Way Exit – Complete interchange reconstruction: Braid SB OR 217 exit to I-5 with Kruse Way exit.
- I-5/OR217 Interchange Phase 3: SB OR217 to I-5 NB Flyover Ramp – Complete interchange reconstruction with new SB OR217 to NB I-5 flyover ramp.

In addition, the following design elements should be considered as part of the corridor refinement plan:

- Peak period pricing and HOV lanes for expanded capacity.
- Provide regional transit service, connecting Wilsonville to the central city.
- Provide additional freeway access improvements in the I-5/Wilsonville corridor to improve freight mobility and local circulation.
- Add capacity to parallel arterial routes, including 72nd Avenue, Boones Ferry, Lower Boones Ferry and Carman Drive.
- Add overcrossings in vicinity of Tigard Triangle and City of Wilsonville to improve local circulation.
- Extend commuter rail service from Salem to the Portland Central City, Tualatin transit center and Milwaukie, primarily along existing heavy rail tracks.
- Additional I-5 mainline capacity.
- Provision of auxiliary lanes between all I-5 freeway on- and off-ramps in Wilsonville.

8.2.4.2 Portland Central City Loop (Mobility Corridor #4)

Context

In 2005, the I-5/405 Freeway Loop Advisory Group (FLAG) completed its review of the near- and long-term transportation, land use, and urban design issues regarding the I-5/405 Freeway Loop. Appointed by Mayor Vera Katz and the ODOT Director in 2003, the 24-member group developed and evaluated concepts to address identified transportation issues and needs. The concepts represented a range of options that included modest improvements within existing right-of-way, a One-Way Loop System, and a full tunnel that would connect the Freeway Loop to I-84 and Sunset Highway. The three concepts were evaluated against the region's proposed transportation system, along with projected employment and household growth, for the year 2030.

Graphic illustrating geographic extent of mobility corridor to be developed during the public comment period and added to the final RTP.

In completing its initial review, FLAG found that additional master planning work is needed to identify, prioritize and fund specific projects, and that short-term or interim investments should move forward while the master planning work is being completed. FLAG recommended that planning on I-84/I-5 interchange and the I-5 elements of South Portland Plan contemplated in the area of the interchange of I-405 and I-5 may proceed independent of the Master Plan with the understanding that the final plan for any such project would be consistent with the Master Plan. In addition, the study recommended advancing a corridor refinement plan to begin to identify short-term and long-term investments and a recommended scope, problem statement and set of principles:

Scope

- Develop an overall Freeway Loop Corridor Refinement Plan that will guide public investment for improvements to the I-5/405 Freeway Loop.
- Develop a phasing strategy for implementation of the Master Plan. Include the currently approved Regional Transportation Plan improvements as well as new elements.
- Identify and pursue a funding strategy.

As directed by the FLAG's recommendations, planning proceeded on the I-84/I-5 section of the Loop under the N/NE Quadrant and the I-5 Broadway-Weidler Interchange Improvement Planning process. The key recommendations from the adopted 2012 N/NE Quadrant Plan include:

- Preserving and enhancing Lower Albina by protecting the working harbor and increasing land use flexibility that promotes a mix of uses on historic Russell Street and greater employment densities;
- Protecting historic neighborhoods and cultural resources;
- Concentrating high density development in the Lloyd District, with a focus on new residential development that will add activity and vibrancy to the district;
- Providing amenities, such as parks, street improvements and green infrastructure to support and encourage new development;
- Improving regional access and local street safety and connectivity for all modes;
- Encouraging sustainable development that supports the Lloyd EcoDistrict and goals for improved environmental health;
- Future changes to zoning and building height regulations that implement the plan goals.

Key recommendations for the I-5 Broadway-Weidler Plan include:

- Adding auxiliary lanes and full-width shoulders to improve traffic weaves and allow disabled vehicles to move out of traffic lanes;
- Rebuilding structures at Broadway, Weidler, Vancouver and Williams and adding a lid over the freeway that will simplify construction, increase development potential and improve the urban environment;
- Moving the I-5 southbound on-ramp to Weidler to improve circulation and safety;
- Improving conditions for pedestrian and bicycle travel by adding new connections over the freeway and safer pedestrian and bicycle facilities in the interchange area.

The recommendations of the N/NE Quadrant Plan were incorporated in the recently adopted Central City 2035. In addition, as part of the plan, ODOT and the City worked to designate the Central City as a Multimodal Mixed-Use Area (MMA). MMAs are State designated high density, mixed use areas that are well served by multimodal transportation. MMA areas are exempt from mobility standards as part of land use amendments (safety and other State mandated policies remain in effect). As a condition of the MMA, the City and ODOT worked to identify safety improvements for the Loop (including the I-5 Broadway/Weidler Project), which were subsequently added to the City's list of TSP projects and submitted to Metro as part of the 2018 RTP.

Proposed Mobility Corridor Purpose Statement

The purpose of the study is to develop alternative design concepts for Portland Central City Loop. Improvements to the I-5/4-5 Freeway Loop must address long-term transportation and land use needs in a system-wide context. Because the movement of people and goods is a vital economic function, changes must be considered in relation to local, regional, and statewide geographies. Freeway Loop improvements should enhance,

not inhibit, high-quality urban development, and should function as seamless and integral parts of the community.

Proposed Principles

These objectives will guide the selection and evaluation of options in the next phase:

- Maintain or enhance transportation performance, including safe and reliable highway operations and enhanced transit performance.
- Support a multi-modal strategy for automobiles, transit, trucks, bicycles, and pedestrians.
- Support the designation of the Central City as a Multimodal Mixed-Use Area (MMA).
- Support trade and freight movement to facilitate regional and state economic development.
- Support local, regional, and state land use plans.
- Ensure regional accessibility to and from the Central City to reinforce its significant statewide, regional, and national economic role.
- Support economic activities and new investments in the Central City and in adjacent industrial areas.
- Improve the quality of the built environment and multimodal connections across facilities.
- Avoid or minimize negative impacts on the natural and built environments.
- Evaluate facility improvement costs relative to the distribution of benefits and impacts.
- Develop strategies that can be implemented in phases, including consideration of value pricing.

8.2.4.3 Clark County to I-5 via Gateway, Oregon City and Tualatin (Mobility Corridors #7, 8, and 10)

Improvements are needed in this corridor to address existing deficiencies and expected growth in travel demand in Clark, Multnomah and Clackamas counties. Transportation solutions in this corridor should address the following needs and opportunities:

- Provide for some peak period and off-peak mobility and reliability for longer trips.
- Preserve freight mobility from I-5 to Clark County, with an emphasis on connections to Highway 213, Highway 224 and Sunrise Corridor.

Graphic illustrating geographic extent of mobility corridor to be developed during the public comment period and added to the final RTP.

- Maintain an acceptable level of access to the Oregon City, Clackamas and Gateway regional centers and Sunrise industrial area.
- Maintain acceptable levels of access to PDX, including air cargo access.
- Adding general purpose lanes to I-205 should be considered to meet state and regional policies, to bring the freeway up to three through lanes in each direction in the southern section from Oregon City to I-5 and allow for potential for bus-on-shoulder operations for bypassing of traffic queues on I-205 during periods of congestion.
- Expanded transit service in the corridor including provision of I-205 express bus service between Clackamas regional center and Bridgeport in Tualatin, and frequent bus service between Clackamas regional center and Clackamas Community College via downtown Oregon City.
- Extend high capacity transit service from Milwaukie to Oregon City along McLoughlin Boulevard.
- Interchange improvements, auxiliary lanes and other major operational improvements such as ramp improvements and other weaving area improvements in the corridor should also be considered. Specific projects to be considered to meet identified needs include:
 - Southbound truck climbing lanes from Willamette River to 10th St. interchange;
 - Interchange improvements at locations including: Division/Powell, Airport Way, OR213, OR 212/224, Sunrise, Johnson Creek Boulevard and others;
 - Auxiliary lanes, northbound and southbound in the following locations: Airport Way to Columbia Blvd., Columbia Blvd. to I-84, I-84 to Glisan, Glisan to Division/Powell, Division/Powell to Foster, Foster to Johnson Creek Boulevard, OR 212/224 to Gladstone, Gladstone to OR 99E;
 - Widen to 6 lanes from Stafford Interchange to Willamette River;
 - Widen Abernethy Bridge to 6 lanes plus auxiliary lanes;
 - Improvements needed on OR 213 (82nd Avenue) include bicycle/pedestrian and streetscape improvements.

Potential transportation and land use solutions in this corridor should evaluate the potential of the following design concepts:

- Auxiliary lanes added from Airport Way to I-84 East.
- Consider express, peak period pricing or HOV lanes as a strategy for expanding capacity.
- Relative value of specific ramp, overcrossing and parallel route improvements.
- Evaluate crash history of arterials and throughways in study area, with a focus on fatal and serious injury crashes, to inform potential transportation solutions and phasing.

- Eastbound HOV lane from I-5 to the Oregon City Bridge.
- Truck climbing lane south of Oregon City.
- Potential for inter-city transit service, vanpool services and other travel options, to/from rural areas and neighboring cities in Clackamas County, to expand travel options and slow traffic growth in the I-205 corridor.
- Potential for rapid bus transit service or light rail from Oregon City to Gateway.
- Potential for extension of rapid bus service or light rail north from Gateway into Clark County.
- Potential for refinements to 2040 land-use assumptions in this area to expand potential employment in the sub-area and improve jobs/housing imbalance.
- Potential for re-evaluating the suitability of the Beavercreek area for urban growth boundary expansion, based on ability to serve the area with adequate regional transportation infrastructure.
- Explore opportunities to support economic and land use goals with the Columbia Connections Strategy.
- Provide recommendations to the Bi-State Coordination Committee prior to JPACT and Metro Council consideration of projects that have bi-state significance.

8.2.4.4 Beaverton to Forest Grove (Mobility Corridor #14 and #15)

A number of improvements are needed in this corridor to address existing deficiencies and serve increased travel demand. One primary function of this route is to provide access to and between the Beaverton and Hillsboro regional centers. Tualatin Valley Highway also serves as an access route to Highway 217 from points west along the Tualatin Valley Highway corridor. As such, the corridor is defined as extending from Highway 217 on the east to Forest Grove to the west, and from Farmington Road on the south to Baseline Road to the north.

Graphic illustrating geographic extent of mobility corridor to be developed during the public comment period and added to the final RTP.

The TV Highway Corridor Plan (TVCP) is a “mobility corridor refinement” plan completed in June 2013. The TVCP studied the Beaverton to Hillsboro portion of the Beaverton to Forest Grove mobility corridor between Cedar Hills Boulevard (Beaverton Regional Center) and SE 10th Avenue/Maple Street (Hillsboro Regional Center). The northern boundary of the study area was Baseline Road/Jenkins road and the southern boundary was Farmington Road, Oak Street, Davis Street and Allen Boulevard. There are still two

outstanding sections of the corridor left to be studied: within Beaverton (OR 217 to SW Cedar Hills Blvd) and from Hillsboro (west of SE 10th Avenue/Maple Street) to Forest Grove.

The TVCP was a joint effort between ODOT, Metro, the City of Hillsboro, the City of Beaverton and Washington County that focused an examination of the transportation system to identify needs and improvements for all modes of transportation. A number of improvements have been identified in this corridor to address existing deficiencies and safety concerns and serve increased travel demand.

A long-term transit solution for Tualatin Valley Highway has yet to be identified. In advance of this transit study additional land area is to be preserved for Business Access Transit (BAT) / High Capacity Transit (HCT) uses. This land area is not intended to be used for general purpose through lanes. Development along Tualatin Valley Highway shall consider opportunities so as to not preclude a future Business Access and Transit lane in the westbound direction, and to not preclude Bus pullouts in the eastbound direction.

RTP Design and Functional Classifications.

Early in the project, the TVCP PG gave policy direction to maintain the design and function of TV Hwy as an urban arterial that will not exceed motorized vehicle capacity of two through travel lanes in each direction. Consistent with this decision, proposed actions along TV Hwy will be developed during subsequent refinement planning and design work to maximize the use of the typical 100 feet to 107 feet of existing right-of-way (ROW) to serve multimodal travel. Additionally, the RTP Arterial & Throughway map and System Design Classification maps are amended. TV Highway will be changed from “Principal arterial” to “Major Arterial” on the Arterial & Throughway map. It will be changed from “Throughway” to “Regional Street” on the System Design map.

The TVCP recommendations fall into 3 categories: 1) Near Term Actions, 2) Opportunistic Actions, and 3) Longer Term Refinement Planning Needs.

Near Term Actions

The proposed improvements described below will address existing needs, including multimodal system completeness and safety, and can reasonably be expected to be completed within the next 15 years with a strong commitment from one or more of the partner agencies that have jurisdiction over subject transportation facilities.

- Complete detailed multi-agency study to determine future potential for high capacity transit solutions within the Tualatin Valley Highway corridor.
- The Moving Forward TV Highway Plan will be developed as a multi-agency study that determine nature and feasibility of HCT in the TV Highway corridor between SW 160th Ave and Cornelius Pass Rd.
- Improve bus stops along Tualatin Valley Highway
- More frequent bus service

- Add street lighting on Tualatin Valley Highway
- Improve Tualatin Valley Highway pedestrian crossings
- Complete Planning and Conceptual design for a Multi-use path
- Fill gaps in sidewalks and add landscape buffers along Tualatin Valley Highway
- Add directional way finding signs
- Complete the (currently discontinuous and narrow) bike lanes on Tualatin Valley Highway
- Improve bike crossings of Tualatin Valley Highway
- Develop continuous east-west parallel bike routes north and south of Tualatin Valley Highway
- Public community rail safety education
- Support and promote employer incentive programs to reduce driving
- Improve signal timing, transit prioritization and traffic operations monitoring
- Signal prioritization for transit
- Adaptive signal control (“smart signals” that adjust timing to congestion levels)
- Improve operations at signalized intersections along Tualatin Valley Highway
- Intersection modification to address safety and mobility
- Left-turn signal improvements

Opportunistic Actions

Understanding that funding opportunities (whether public funding or public funding in combination with private sources) may arise for transportation improvements within the TVCP Project Area to work towards to meet the goals and objectives of the TVCP, while attempting to:

- Encourage private contributions by developers to implement the near term improvements, including reserving ROW for future transportation improvements (*City of Hillsboro, City of Beaverton, Washington County*).
- Acquire the ROW to develop a westbound business access transit (BAT) lane as redevelopment opportunities arise on Tualatin Valley Hwy. The City of Hillsboro may also require all half-street improvements be constructed to include the setback curb, planter strip, and sidewalk improvement to create an amenable environment for future transit solutions on Tualatin Valley Highway. This redevelopment should be consistent with ODOT standards. The City of Hillsboro has determined that a BAT lane would not provide the anticipated benefit for transit service and therefore the city isn't acquiring ROW to develop the BAT lane as redevelopment opportunities occur on TV Hwy check with Gregg Snyder about this. The Moving Forward TV Highway

Enhanced Transit and Access Plan will look at whether there are benefits of using a BAT lane in part of the corridor from 160th to Cornelius Pass Road.

- As projects arise from appropriate categories examine whether opportunities are available to use other funds to leverage this funding (e.g., safety) (*ODOT, consulting with partners*).
- As land use and transportation system conditions change and near term improvements are completed, consider the opportunity to update this adaptive corridor management strategy (*all partners*).
- Improve existing north-south routes for all modes to reduce travel demand on Tualatin Valley Highway and congestion at intersections. Improvements to roadways such as Brookwood Avenue, Century Boulevard, Cornelius Pass Road, 209th Avenue, 198th Avenue, 185th Avenue, and 170th Avenue would provide the greatest benefit to the overall transportation system. Five improvements on 198th Avenue south of Tualatin Valley Highway are scheduled in the next five years through Washington County's Major Streets Transportation Improvement Program. The other three corridors will require a more opportunistic approach, including working with developers of South Hillsboro to help improve 209th Avenue (*City of Hillsboro, City of Beaverton, Washington County*).
- Improve east-west connectivity (such as those proposed in the upcoming South Hillsboro UGB development mitigation) in addition to the near term actions proposed in South Hillsboro such as the Kinnaman and Rosa Road extensions (*City of Hillsboro, City of Beaverton, Washington County*).
- Complete the bicycle and pedestrian system in the TVCP Project Area to increase connectivity and access.
- Examine transit service for enhancements and improvements in the near term improvements list to leverage added service or other capital enhancements. TriMet has been awarded two Statewide Transportation Improvement Program (STIP) projects (Highway 8 Corridor Safety and Access to Transit) for improved safety, active transportation, access to transit and transit operations by improving bus stops, constructing landing pads, and enhancing crossings. ODOT will be enhancing two pedestrian crossings, infilling sidewalks, consolidating bus stops, providing transit queue jumps at one location and improving a bus stop For the second application (between 110th Avenue and SW 209th Avenue on TV Hwy), the project will enhance four pedestrian crossing locations, install buffered bike lanes between 153rd and 182nd Aves, consolidate bus stops, install illumination, ped actuation and signal interconnect at 141st/142nd and 174th, install physically separated walkways and bike lanes on bridge sections between 153rd and 160th Ave and the between 30th and 40th Aves.
- Reduce vehicle turn movements to/from driveways on TV Highway. This would improve safety and mobility of pedestrians, bicyclists, and motorists on TV Hwy. Further access consolidations are recommended in conjunction with other property redevelopment.

Long Term Refinement Planning Needs

The refinement plan was unable to adequately address some longer term planning aspirations for the corridor. The following should be addressed as part of a future corridor refinement plan:

- The preferred location (e.g. on or adjacent to Tualatin Valley Highway) and most viable transit mode (e.g., bus rapid transit, express bus service, light rail, streetcar, or commuter rail) and amount of right-of-way needed for a long-term HCT solution for Tualatin Valley Highway. This transit alternative analysis study may explore enhanced signal operations for transit and/or the viability of a Business Access Transit (BAT) lane in appropriate locations. The Moving Forward TV Highway Enhanced Transit and Access Plan will determine the nature and feasibility of HCT in the corridor primarily between 160th and Cornelius Pass Rd.
- The location of a multi-use pathway parallel to Tualatin Valley Highway.
- The location of new local street connections, in concert with access management along Tualatin Valley Highway.
- While grade separated intersections are not included in the plan, it is recognized that in the long term, all tools should be considered to maintain acceptable intersection performance to serve future transportation and community needs.

8.2.4.5 Powell-Division Corridor: Portland Central City to Lents Town Center and Lents Town Center to Gresham Regional Center (Mobility Corridors #19 and #20)

The Powell-Division Corridor is included in Mobility Corridors #19 and #20. The Mobility Corridor Strategy identified in 2014 RTP Appendix 3.1 notes that both corridors are anticipated to experience high levels of growth in employment and population by the year 2040.

A number of investments are needed in these corridors to address existing deficiencies and serve increased travel demand.

The Powell-Division Transit and Development Plan alternative analysis identified a project – now called the Division Transit Project - that addresses some of the needs identified for the Powell-Division Corridor by improving transit and safety on Division Street with a bus rapid transit project. The Division Transit Project is a part of the financially constrained RTP project list. The Division Transit Project does not fully address the transit, safety, and mobility needs that remain on Powell Boulevard.

Graphic illustrating geographic extent of mobility corridor to be developed during the public comment period and added to the final RTP.

Project development analysis and public input has resulted in a Locally Preferred Alternative for a Division Transit Project that includes bus rapid transit running from downtown Portland to downtown Gresham on Division Street through southeast Portland. Project partners recognized that Powell Boulevard improvements are still needed to address safety and mobility needs for all modes and supply essential transit connections in this corridor. Also, a number of steering committee members qualified their votes of support for the Locally Preferred Alternative as contingent upon a commitment to further study Powell Boulevard to address safety and mobility needs moving forward. Based on community feedback and analysis during the Powell-Division Transit and Development project, the City of Portland included language documenting this recommendation in their LPA adopting resolution, as follows:

BE IT FURTHER RESOLVED, that Metro advance Powell Boulevard for regional consideration and prioritization within the High Capacity Transit planning process, and amend the Regional Transportation Plan to assert continued need for Powell Boulevard transit improvements.

This recommendation was codified by the City of Portland in its ordinances adopting the Locally Preferred Alternative and in the accompanying Powell-Division Transportation and Development Strategy (an attachment to the jurisdiction's LPA resolution).

The Powell-Division Corridor is included in Mobility Corridors #19 and #20. The Mobility Corridor Strategy identified in 2014 RTP Appendix 3.1 notes that both corridors are anticipated to see high levels of growth in employment and population by the year 2040.

Mobility Corridor #19 provides an important connection between the Portland Central City and the Lents Town Center and provides important freight access to rail facilities at Brooklyn Yard and access from Powell Boulevard and McLoughlin Boulevard to the Central Eastside Industrial District. This corridor also serves statewide and regional travel on Powell Boulevard (US 26), which serves as a statewide and regional freight route between I-5 and I-205.

The corridor does not meet regional performance thresholds (does not perform as it should) for its throughways (Powell Boulevard) and arterials (Division and Holgate streets) as defined in the Regional Transportation Plan due to high volume to capacity ratios.

Strategies adopted in 2014 RTP Appendix 3.1 to improve the corridor include:

Near term:

- System and demand management along Powell Boulevard and parallel facilities for all modes of travel.
- Improved, safe pedestrian and bicycle crossings of Powell Boulevard.
- Modify existing signals, coordinate and optimize signal timing to improve traffic operations on Powell Boulevard.

- Prioritize and construct safety and streetscape improvements from SE 50th to SE 84th Avenue.

Medium term:

- Improve safety by all modes and enhance opportunities for use of bicycles, walking and transit on Powell Boulevard.
- Identify and implement potential changes to the cross section of Foster Road based on the Foster Streetscape Plan.

Mobility Corridor #20 provides an important connection between the Lents Town Center and the Gresham Regional Center. The corridor provides important freight access, connecting I-205 to Gresham and the Springwater Industrial Area. In addition, the corridor serves statewide travel, connecting to routes that lead to destinations outside the region such as the Mt Hood Recreational Area and Sandy Oregon.

Similar to Mobility Corridor #19, Mobility Corridor #20 is expected to experience high levels of employment and population growth by 2040 and does not meet regional performance thresholds for its throughways (Powell Boulevard) and arterials (Division and Foster streets) as defined in the Regional Transportation Plan due to high volume to capacity ratios.

Strategies adopted in 2014 RTP Appendix 3.1 to improve the corridor include:

- Near term: System and demand management along the Powell Boulevard and parallel facilities for all modes of travel.
- Medium term: Implement a three-lane cross-section on Powell Boulevard from I-205 to SE 174th Avenue with bicycle and pedestrian improvements.
- Long term: Implement additional capacity enhancements along Powell Boulevard from 162nd to 174th Avenue as needed. Additional enhancements may include intersecting north-south streets along Powell Boulevard.

Project development analysis and public input resulted in a Locally Preferred Alternative for a Division Transit Project that includes bus rapid transit running from downtown Portland to downtown Gresham on Division Street through southeast Portland. The jurisdictions recognized that Powell Boulevard improvements are still needed to address safety and mobility needs for all modes and supply essential transit connections in this corridor. Also, a number of steering committee members qualified their votes of support for the Locally Preferred Alternative as contingent upon a commitment to further study Powell Boulevard to address safety and mobility needs moving forward. Based on this conclusion, the RTP was amended to include an additional, future corridor refinement plan for Powell Boulevard as part of the adoption.

In addition, during the Division Transit Project's LPA process, project partners (TriMet, Metro, City of Gresham, Multnomah County, and Mount Hood Community College) developed a Memorandum of Understanding (MOU), in which TriMet committed to

improve service to Mount Hood Community College with more frequent service on the Line 20, which will connect the college to the new bus rapid transit line and neighborhoods, and new transit amenities added at the college. The MOU also included a commitment to engage with the college and other signatories to identify future transit improvements in the area, and to seek to identify potential improvements at the Gresham Transit Center in coordination with the City of Gresham. Likewise, a number of steering committee members shared their support for the LPA was contingent upon these actions.

8.2.4.6 Hillsboro to Portland (Mobility Corridors #13 and 14)

Improvements are needed in this corridor to address existing deficiencies and future growth in freight, commuters, and commercial traffic between Hillsboro’s Silicon Forest, Northern Washington County’s agricultural freight, and the Portland Central City, the international freight distribution hub of I-5 and I-84, the Port of Portland marine terminals, rail facilities, and the Portland International Airport. This corridor is generally defined by US 26 (Sunset Highway), which extends from the Oregon Coast through the Vista Ridge Tunnel where it intersects with the I-405 loop accessing I-5, and I-84. The Sunset Highway Corridor Study is recommended to evaluate multi-modal improvement needs between I-405 and the US 26/Brookwood Parkway interchange.

Graphic illustrating geographic extent of mobility corridor to be developed during the public comment period and added to the final RTP.

Corridor Growth Demand

Corridor #13, which extends east to the Willamette River including the western portion of Portland’s Central City and Corridor #14 extending west from Murray Boulevard to North Plains will account for 22 percent of the region’s households, 20 percent of the region’s population, and 31 percent of the region’s employment by 2040.

Freight Mobility Challenges

Much of the existing and projected employment in Corridor #14 is traded-sector manufacturing employment, which places a high priority on its ability to import raw materials and export finished goods to the national and international market through Portland’s air, water, rail, and trucking distribution infrastructure.

The 2013 *Westside Freight Access and Logistics Analysis* found that greater Portland’s export economy relies on the computer and electronics industry, which accounts for over half the value of the region’s exports. 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 greater

Portland area. Addressing freight mobility challenges experienced by the Westside computer and electronics industry will likely also benefit the footwear, apparel, medical/dental, biopharma and agriculture industries in Washington County.

Freight movement between the Westside industries and the PDX freight consolidation area and the Portland International Airport depends on two routes:

- US 26 eastbound to I-405 northbound to I-5 Northbound to Columbia Boulevard;
- Cornelius Pass Road northbound to US 30 southbound to Columbia Boulevard via the St. Johns Bridge

In interviews conducted for the *Westside Freight Access and Logistics Analysis* study, freight shippers of computer and electronics products reported afternoon congestion and reliability challenges within the US 26/I-405/I-5 corridor and that Cornelius Pass Road/US 30 becomes the de facto route in the afternoon. This was confirmed in travel time analysis conducted in conjunction with the study. In addition, ODOT Region 1's *Portland Region 2016 Traffic Performance Report* documented a further degradation of travel in the US 26 corridor since 2013 and identified that US 26 eastbound between Highway 217 and I-405 ranks in the top 10 of the region's bottlenecks in the region.

Safety and Reliability

With congestion becoming more pervasive on US 26 in the area of the Vista Ridge Tunnels and the I-405 interchange, traffic crashes have continued to increase. Cumulatively, there are 10 discreet locations on US 26 between I-405 and Highway 217 that rank in the state's top 10 percent of crash high-priority locations statewide.

Hazardous Materials and Natural Hazards

Sunset Highway at the Vista Ridge tunnels prohibits the hauling of hazardous materials. Petroleum products used to fuel vehicles in the Tualatin Valley and chemicals, including but not limited to industrial gases used in the manufacturing of silicon wafer products, commonly use Cornelius Pass Road with Highway 217 as the secondary route.

Both the Sunset Highway corridor and the secondary freight route of Cornelius Pass Road are susceptible to recurring incidents such as crashes, landslides, and trees blocking the roadways. In both cases, the regional transportation system lacks "redundancy" to accommodate any unforeseen impediments to travel. Similarly, both corridors (and their Willamette River bridges) are not likely to prove reliable and sustainable in the event of a Cascadia earthquake.

Commuter and Commercial Travel Demand

Corridor #13, which includes Sunset Highway and its array of complementary parallel arterial roadways (Cornelius Pass Road, Germantown Road, Cornell Road, Barnes/Burnside Road, and Beaverton-Hillsdale Highway), carry approximately 229,150 vehicles per day comprising roughly 390,000 person-trips per day. Of the total vehicle

trips, Sunset Highway carries 160,000 vehicles per day, including 6,000 trucks, and Cornelius Pass Road serves approximately 11,000 vehicles per day.

At present, transit carries approximately 29,000 person-trips per day on the MAX Blue Line, the MAX Red Line, and multiple bus routes serving the parallel arterials in the corridor (23,600 on Blue/Red MAX). Together, transit is serving approximately more than 7 percent of the person-trips on the corridor connecting Portland's Central City to the northern Tualatin Valley, but about 17 percent of peak hour travel on the Sunset Highway corridor itself. The MAX Blue Line operates at near capacity presently during peak periods, prompting TriMet to plan the western extension of the MAX Red Line to Hillsboro's Airport/Fair Complex Station by approximately 2022.

Hillsboro has also been working with TriMet, Washington County, and the City of Portland to advance a potential new Sunset Highway Express Bus service which is envisioned to operate from Forest Grove through the north Hillsboro industrial area to Portland via US 26 with regional park-and-rides at Hillsboro Stadium and potentially near the US 26/ Cornell-Bethany interchange.

Potential Solutions

Potential transportation solutions in this corridor should evaluate the costs and benefits of the following range of investments intended to reduce congested hours of operations through the corridor, improve travel time reliability, reduce crash frequency, and improve transit utilization. The study would identify a set of potential improvements that would be subsequently advanced for further study and potential project development and funding. The following should be addressed as part of a future corridor refinement plan:

- Evaluate crash history of arterials and throughways in study area, with a focus on fatal and serious injury crashes, to inform potential transportation solutions and phasing.
- Deploy Intelligent Transportation Systems infrastructure including variable speed signs, traveler information signs, corridor Bluetooth origin/destination tracking, and improved ramp meter algorithms.
- Evaluate potential ramp meter bypass(es) for freight and transit use along the Sunset Highway corridor.
- Operational improvements at the US 26 and I-405 bottleneck which may include modifications or full/part-time closures of I-405 ramps to NW Everett Street and from SW Montgomery Street and modifications to lane channelization on US 26 approaching the interchange.
- Expanded transit service on the corridor including provision of a Sunset Highway express bus service between the Portland Central City via the SW Jefferson Street interchange and Hillsboro (or Forest Grove).
- Evaluate the potential for bus-on-shoulder operations for bypassing of traffic queues on US 26 during periods of congestion.

- Expand the Sunset Transit Center park-and-ride capacity.
- Extend high capacity transit service from Portland to north Hillsboro along Sunset Highway including additional park-and-ride locations west of Highway 217. This improvement could consider use of paid parking at park-and-ride locations as a potential public-private partnership funding opportunity.
- Increase the frequency of MAX Blue Line and MAX Red Line and extend the MAX Red Line west to the Hillsboro Airport/Fair Complex station.
- Develop a transit service route that connects US 26 from Powell Boulevard to Sunset Highway to better accommodate demand between SE Portland/Clackamas County and northern Washington County.
- Evaluate potential benefits of congestion pricing on Portland area freeways, including I-5, I-405, US 26, and Highway 217.
- Evaluate widening of Barnes Road-Burnside Road to five lanes between NW 23rd Avenue and Highway 217.
- Evaluate widening improvements to Cornelius Pass Road between US 26 and US 30 to determine near-term and long-term needs (jurisdictional transfer from current Washington County/Multnomah County to ODOT is in process).
- Evaluate a North Willamette Freight Bridge over the Willamette River north of the community of St. Johns extending from US 30 to the western terminus of Columbia Blvd and N. Lombard Street. This improvement could be a potential tolled facility and a public-private partnership opportunity.
- Evaluate freight-related improvements to address multi-modal conflicted corridors between the Willamette River and the PDX freight aggregation/air cargo areas along Columbia Boulevard and Marine Drive.
- Evaluate a potential improvement to Cornelius Pass Road, Germantown Road between Cornelius Pass Road and approximately Old Germantown Road, and a new multi-modal tunnel under Forest Park connecting to US 30 and the North Willamette Freight Bridge (the Northern Arterial or Northern Connector identified in the Washington County Futures Study). The evaluation should assess potential land use impacts in the area. This improvement could be a potential tolled facility and a Public-Private Partnership opportunity.

8.2.4.6 Clackamas to Columbia (Mobility Corridor #24)

This effort will create a consistent, coordinated, multi-jurisdictional transportation plan that focuses on needed improvements for all modes along the 181st/182nd/190th/172nd corridor that connects I-84 in Multnomah County and Highway 212 in Clackamas County. The corridor crosses a wide variety of land uses, both existing and planned. The effort will use the results of the planning projects that have been initiated locally (e.g., Pleasant Valley TSP Refinement Project, Happy Valley Pleasant Valley/North Carver Comprehensive Plan, and the Clackamas County TSP Update), and evaluate packages of multimodal improvements that will improve mobility and access along the corridor to jobs, housing and key commercial and industrial areas. This effort will identify a preferred package of transportation improvements and detail how they can be phased for implementation. This effort will also provide recommendations on urban street design as well as recommend amendments to local TSPs and the Regional Transportation Plan to implement the preferred multimodal package.

Note: Graphic illustrating geographic extent of mobility corridor to be developed during the public comment period and added to the final RTP.

Potential Solutions

This effort will recommend a shared mobility corridor investment strategy, including long-term needs and improvements for auto, bicycle, freight, pedestrian, and transit mobility and connectivity. This effort will expand on already adopted planning efforts in the corridor to create a multi-jurisdictional implementation strategy that provides a clear path from existing conditions to desired transportation improvements that support community and regional goals for equity, housing, economic development, environmental protection and access to nature. The planning process will include extensive public involvement and identify a set of potential improvements that would be subsequently advanced for further study and potential project development and funding.

The following should be addressed as part of this effort:

Note: This section will be further developed in partnership with Clackamas and Multnomah counties, the cities of Happy Valley and Gresham and ODOT during the public comment period to reflect the draft scope of work being prepared for TGM-funded planning effort.

8.3 PROJECTS

8.3.1 Major Project Development

Transportation improvements where needs, modes, functions and general locations of improvements have already been identified in the RTP and local plans must be further planned at a detailed, project development level. For major projects, project development is generally completed jointly by affected or sponsoring agencies, in coordination and consultation with Metro. For purposes of the RTP, major projects are defined as large-scale, complex investments in the transportation system that typically cost \$500 million or more regardless of the source of funding for the total project and is likely to receive state or federal financial assistance. Projects with total costs between \$100 million and \$500 million may also be considered major projects. Major projects typically have a high level of public, legislative or congressional interest, may be constructed in multiple phases and are anticipated to go through one of the planning processes identified below.

The purpose of project development is to consider project design details and select a specific project alignment, as necessary, after evaluating engineering, management and design alternatives, potential environmental impacts and consistency with applicable comprehensive plans, the Oregon Transportation Plan and the RTP. The TPR defines project development as, “implementing the transportation system plan by determining the precise location, alignment and preliminary design of improvements included in the TSP based on site-specific engineering and environmental studies,” (660-012-005 (36)). The project need, mode, function and general location do not need to be addressed again at the project level, since these decisions have been previously documented in the adopted corridor refinement plan or RTP project list.

In the case of projects requiring an Environmental Impact Statement, Environmental Assessment, or Documented Categorical Exclusion for a project of regional significance with multiple jurisdictions, decisions are documented through adoption of a Locally Preferred Alternative. Project development decisions for projects that qualify for a Categorical Exclusion under NEPA are documented by other means in accordance with the responsible agency’s procedures.

Once the RTP or corridor refinement plans have established mode, function, general location, and identified solutions, project development may also result in recommended phasing of improvements.

A summary of completed and current major project development activities follows.

Table 8.2 Completed and Current Major Project Development

Project	Status
Interstate 5/Columbia River Crossing Project	LPA approved in July 2008.
Sunrise Project and Sunrise Jobs and Transportation Act Project	LPA approved in July 2009. Phase 1 (Unit 1) related projects were completed in June 2016. <i>Status of remaining phases to be added to final 2018 RTP.</i>
Division Transit Project	LPA approved in June 2017
Southwest Corridor Project	LPA anticipated to be approved Dec. 2018
I-5 Rose Quarter Improvement Project	Environmental Assessment anticipated to be published in November 2018. Design anticipated to begin in 2019.
MAX Red Line Improvements Project	<i>To be added to final 2018 RTP.</i>
OR 217 Project	OR 217 Southbound: ▪ Categorical Exclusion anticipated by October 2018. OR 217 Northbound: ▪ Categorical Exclusion anticipated by April 2020.
I-205 South Corridor Widening and Seismic Improvements Project	Categorical Exclusion approval anticipated in fall 2018.

8.3.1.1 Interstate 5/Columbia River Crossing Project (Mobility Corridor #1 – Portland Center City to Clark County)

This heavily traveled route is the main connection between Portland and Vancouver. In July 2008, the Metro Council approved a Locally Preferred Alternative for the Columbia River Crossing Project (CRC). It creates a multi-modal solution for the Interstate 5 corridor between Oregon and Washington to address the movement of people and freight across the Columbia River. The LPA includes a replacement bridge with three through lanes in each direction, reconstructed interchanges, tolls priced to manage travel demand as well as provide financing of the project construction, operation and maintenance, light rail transit to Vancouver, and bicycle and pedestrian investments have been identified for this corridor.

More generally in the I-5 corridor, the region should:

- Consider the potential adverse human health impacts related to the project and existing human health impacts in the project area, including community enhancement projects to address environmental justice.
- Consider managed lanes or pricing systems to help manage congestion.

- Maintain an acceptable level of access to the central city from Portland neighborhoods and Clark County.
- Maintain off-peak freight mobility, especially to numerous marine, rail and truck terminals in the area.
- Ensure that there is safe, reliable, affordable, and efficient transit connections between the growing downtown of Vancouver and key job sites in the Portland metropolitan region, including downtown Portland and Washington County.
- Consider new arterial connections for freight access between Highway 30, port terminals in Portland and port facilities in Vancouver, Washington.
- Maintain an acceptable level of access to freight intermodal facilities and to the Northeast Portland Highway.
- Address freight rail network needs.
- Develop actions to reduce through-traffic on MLK and Interstate to allow main street redevelopment.
- Explore opportunities to support economic and land use goals with the Columbia Connections Strategy.
- Inform and coordinate with the Regional Transportation Council (RTC) and the Bi-State Coordination Committee prior to JPACT and Metro Council consideration of projects that have bi-state significance.

8.3.1.2 Sunrise Project and Sunrise Jobs and Transportation Act Project

In July 2009, the project's Policy Review Committee (PRC) selected the Preferred Alternative for the Sunrise Project. The Preferred Alternative is Alternative 2 as studied in the Supplemental Draft Environmental Impact Statement with Design Options C-2 and D-3 and a portion of Design Option A-2 (Tolbert Overcrossing). A detailed description and map of the Sunrise Project Preferred Alternative is included in Appendix Q.

The Federal Highway Administration (FHWA), the Oregon Department of Transportation (ODOT), and Clackamas County completed the Final Environmental Impact Statement (FEIS) for the Sunrise Project and on February 22, 2011, the FHWA signed a Record of Decision (ROD) that approves the Sunrise Corridor Preferred Alternative. The Sunrise Project mainline is an approximately five-mile, east-west oriented, limited-access highway from I-205 to the Rock Creek Junction in Clackamas County.

The Sunrise Jobs and Transportation Act (JTA) Project constructed a new 2.5 mile road from I-205 to 122nd Avenue (as part of the larger Sunrise Project mainline). The Oregon Legislature approved \$100 million in JTA funding for this project, which was built to address congestion and safety problems in the OR 212/224 corridor and improve local roadway connections to the Lawnfield Industrial District. Construction for the JTA phase of the Sunrise Project was completed in June 2016 and opened for use on July 1, 2016.

Future phases of the Sunrise Project include the design and construction of improvements between SE 122nd Avenue and SE 172nd Avenue, consistent with the FEIS and ROD. ODOT, in coordination with local agencies, has initiated preliminary analysis to examine options for the Sunrise Project's connection with OR 212/224 towards the east end of the corridor.

8.3.1.3 Division Transit Project

The Division Transit Project is in the final stages of project development. Based on outreach and analysis, the Steering Committee recommended a Locally Preferred Alternative (LPA) in November and the LPA was adopted by the local jurisdictions in December 2016. The Locally Preferred Alternative (LPA) for the transit project includes the transit mode (bus rapid transit), the route (from downtown Portland on the transit mall to Southeast Division Street to the Gresham Transit Center), and the general stop locations (approximately 1/3 mile apart). The project began the NEPA process by documenting potential impacts and benefits in accordance with federal requirements. With local adoption of the LPA, TriMet is leading the design, traffic analysis, and outreach with support from Metro and other project partners. In June 2017, the Metro Council adopted the LPA by Resolution No. 17-4776 at the same time the Council amended the 2014 Regional Transportation Plan by Ordinance No. 17-1396 to include the LPA in the plan.

TriMet is working with partners to finalize the project's design, and Metro is leading the NEPA process by conducting a Documented Categorical Exclusion. The land use investment strategy pieces are being led by Portland and Gresham, moving forward on their locally adopted Local Action Plans. The Local Actions Plans outline their vision for implementing land use and economic development that complements the transit investment. Construction is anticipated to begin in 2019 with a targeted opening date of fall 2021.

Additional project information is available at: www.trimet.org/division/

8.3.1.4 Southwest Corridor Transit Project

The Southwest Corridor Plan is a comprehensive effort focused on supporting community-based development and placemaking that targets, coordinates and leverages public investments to make efficient use of public and private resources. The work has been guided by a Steering Committee comprised of representatives from the cities of Beaverton, Durham, King City, Portland, Sherwood, Tigard and Tualatin; Washington County; and TriMet, ODOT and Metro. Steering Committee members agreed to use a collaborative approach to develop the Southwest Corridor Plan and a Shared Implementation Strategy to align local, regional, and state policies and investments in the corridor. In August 2011, the Metro Council adopted Resolution 11-4278 that appointed the Southwest Corridor Steering Committee, and a charter defining how the partners will work together was adopted by the Steering Committee in December 2011.

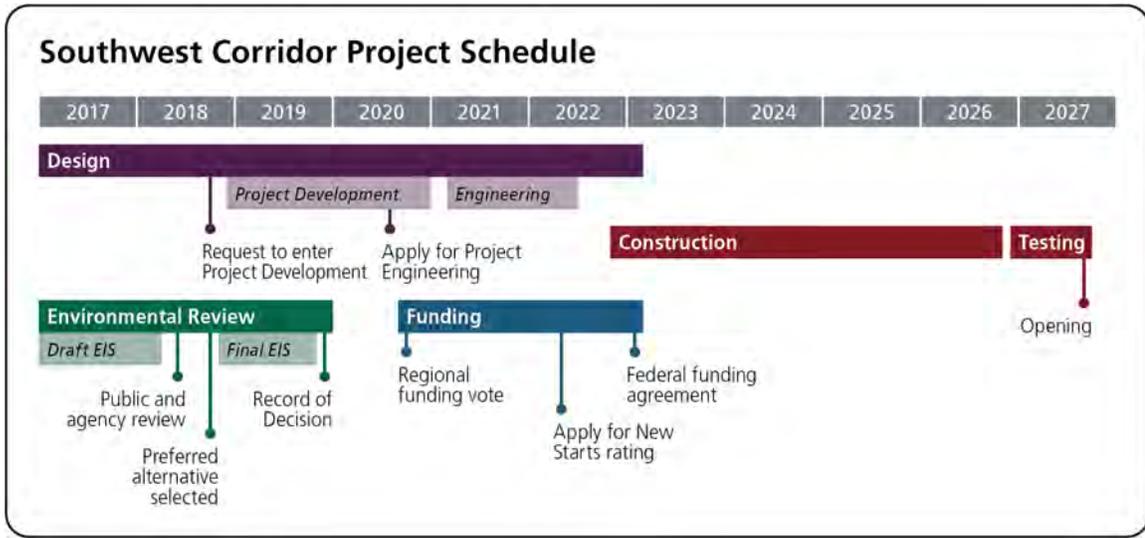
In October 2013, the Metro Council adopted Resolution No. 13-4468A, endorsing the Southwest Corridor Shared Investment Strategy and directing staff to coordinate and collaborate with project partners on refinement and analysis of high capacity transit (HCT) alternatives and local connections in the Southwest Corridor, along with associated roadway, active transportation and parks/natural resource projects that support the land use vision for the corridor. This resolution also directed staff to work with project partners to involve stakeholders at key points in the process and seek input from the public.

In June 2014, the Metro Council adopted Resolution No. 14-4540, which included direction to staff to study the Southwest Corridor Transit Design Options under the National Environmental Policy Act in collaboration with the Southwest Corridor Plan project partners and with the involvement of stakeholders and public, pending Steering Committee direction on the results of the focused refinement analysis

The Southwest Corridor Light Rail Project has emerged as the preferred high capacity transit investment of the Southwest Corridor Shared Investment Strategy. The project is a proposed 12-mile MAX light rail line serving SW Portland, Tigard, Tualatin and the surrounding communities. The proposed project also includes bicycle, pedestrian and roadway projects to improve access to light rail stations. In compliance with the National Environmental Policy Act (NEPA), and at the direction of the Metro Council, an Environmental Impact Statement (EIS) will be prepared by Metro, TriMet and the Federal Transit Agency (FTA) to identify the significant positive and negative impacts the project could have on the built and natural environment and to determine options to avoid, minimize or mitigate those impacts. The Draft EIS, released in summer 2018, assessed the project alternatives remaining from over three years of analysis refinement and suggest ways to avoid, minimize or mitigate significant adverse impacts. The information disclosed in the Draft EIS, and public and agency comments on the Draft EIS, informed the Southwest Corridor Steering Committee in its recommendation of a Locally Preferred Alternative (LPA).

TriMet anticipates requesting entry in Project Development with FTA late in 2018. TriMet will be furthering the transit project design while Metro completes the final EIS. The final EIS will analyze and disclose the benefits and the adverse impacts of the preferred alternative, including the effects of mitigation measures identified in the Draft EIS and selected for inclusion in the project. Upon completion of the final EIS, TriMet will request a Record of Decision (ROD) from FTA, which authorizes the lead agencies to proceed with design, land acquisition, and construction based on the availability of funds. The general schedule for the Southwest Corridor Light Rail Project is shown below, with anticipated opening in fall 2027.

Figure 8.7 Southwest Corridor Project Schedule



More information is available at www.oregonmetro.gov/public-projects/southwest-corridor-plan.

8.3.1.5 MAX Red Line Improvements Project

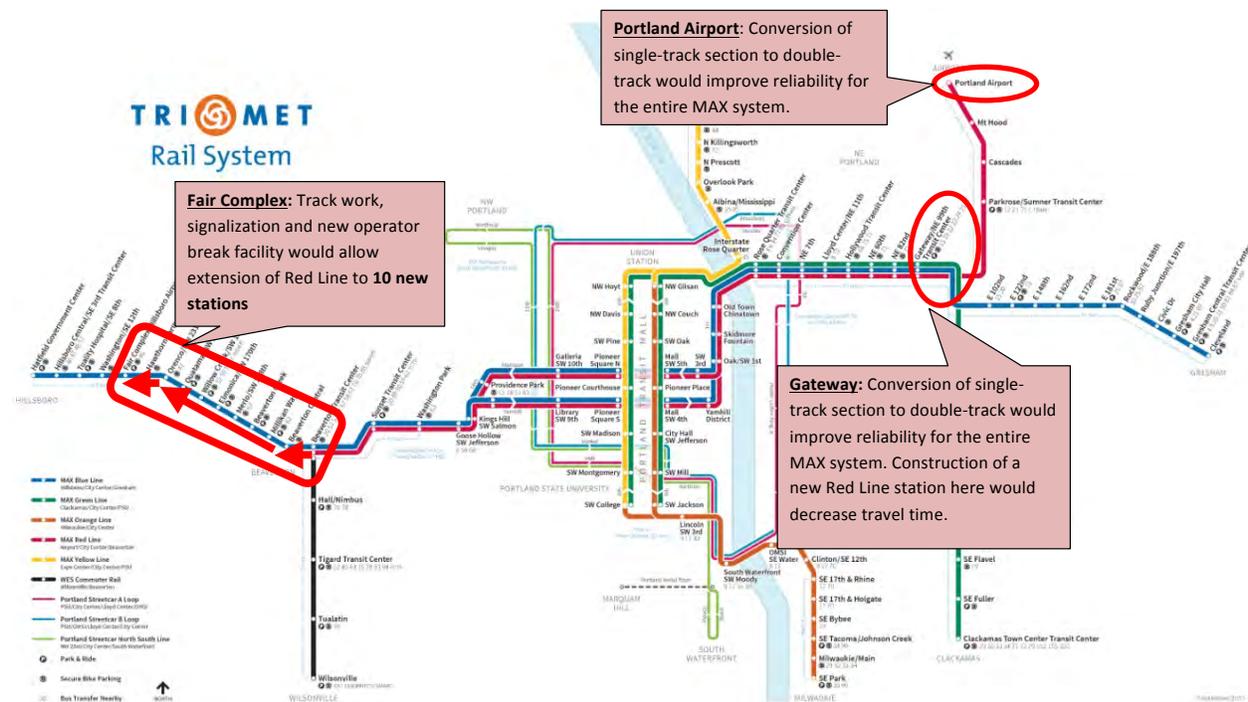
The MAX light rail system provides high capacity transit connecting the major centers of our region. The MAX Red Line has connected the City of Beaverton, downtown Portland, Gateway Regional Center, and Portland International Airport since 2001. Since its opening, there has been substantial growth in the corridor and more demand for reliable transit connecting these important centers. Currently, the Red Line has two single-track sections near Gateway/99th Ave and Portland International Airport, which result in inbound and outbound trains having to wait for each other. If a train is off schedule, these wait times can impact the entire MAX System as trains rely on the same tracks to serve different parts of the region. Adding a second set of tracks in these areas will reduce delays for riders on all five lines. In addition, MAX riders west of Beaverton Transit Center have been requesting Red Line service to better connect a growing part of the region.

The Red Line improvements west of the Beaverton Transit Center include improving track and switches and adding signals and a new operator break facility at the Fair complex/Hillsboro Airport MAX Station allowing Red Line trains to serve ten more west side stations. These stations are currently served by the Blue Line, which is often overcrowded. Improvements will allow TriMet to increase train frequency to better meet rider demand. Improved transit will support anticipated redevelopment at the Port of Portland such as the expansion of the Portland International Airport and potential redevelopment at the Gateway Regional Center.

This project will complete a 2-year design process for the MAX Red Line double tracking and other improvements to increase light rail reliability on all five MAX lines and to

improve carrying capacity to meet transit demand west of the Beaverton Transit Center. TriMet and Metro will work with the local jurisdictions and the Port of Portland to scope the project to improve access to major transit origins and destinations, improve reliability of the entire MAX system, and support future redevelopment at the Gateway Regional Center, the Port of Portland properties, and within Beaverton and Hillsboro. TriMet and Metro will also consult with the federal agencies during the scoping phase. TriMet is coordinating with local jurisdictions to avoid and minimize any potential impacts associated with improving the Red Line. NEPA is expected to be complete in 2019 with construction of improvements in the 2021-2022 timeframe. Opening is targeted for 2022. This work will improve mobility and transit performance throughout the region.

Figure 8.8 MAX Red Line Improvement Project Area Map



More information is available at: www.trimet.org/redlineimprovements.

8.3.1.6 I-5 Rose Quarter Improvement Project

ODOT and the City of Portland are ongoing partners on the I-5 Rose Quarter Improvement Project, which implements the recommendations of the I-5 Broadway-Weidler Facility Plan and the N/NE Quadrant Plan. The purpose of the I-5 Rose Quarter Improvement Project is to improve the safety and operations on I-5 between I-84 and I-405, the Broadway/Weidler interchanges, and adjacent surface streets in the vicinity of the interchange. In achieving the purpose, the Project also supports improved connectivity and multimodal access in the vicinity of the interchange.

The I-5 Rose Quarter Improvement Project is intended to make travel more convenient, reliable, and safe for people driving on I-5, or biking, walking, or taking public transit in the Rose Quarter area. The Project will add:

- One new auxiliary lane in each direction on I-5 between I-84 and I-405 to improve traffic weaves and reduce frequent crashes
- Full shoulders in each direction on I-5 between I-84 and I-405 to create space for disabled vehicles to move out of through traffic and allow emergency vehicles access
- Relocating the I-5 southbound on-ramp from NE Wheeler to NE Weidler
- Highway covers over I-5 at Broadway/Weidler and Vancouver/Hancock to provide space for wide sidewalks, separated bike lanes, roads, and new community spaces
- Bicycle- and pedestrian-only bridge over I-5 from NE Clackamas Street to the Rose Quarter
- New, direct road connection over I-5 between N Hancock Street and N Dixon Street
- New, upgraded pedestrian and bicycle paths in the area of the Broadway/Weidler interchange
- Improved pedestrian and bicycle access to transit, including Portland Streetcar and TriMet bus and MAX lines

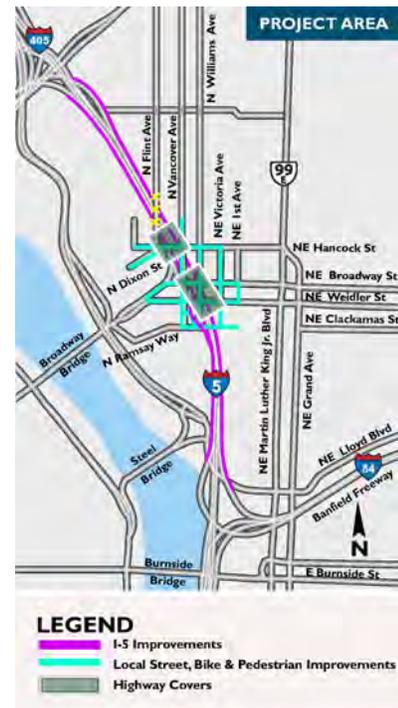


Figure 8.9 I-5 Rose Quarter Improvement Project Area

Figure 8.9 shows the project location and **Figure 8.10** illustrates the project features.

More information is available at www.i5rosequarter.org.



Figure 8.10 I-5 Rose Quarter Improvement Project Features

ODOT initiated the federal environmental review process for the I-5 Rose Quarter Improvement Project in December 2016, with expected publication of an Environmental Assessment by the end of 2018. Project design is scheduled to begin in 2019, with construction beginning as early as 2023.

The I-5 Rose Quarter Improvement Project is one of the projects of statewide significance included in House Bill 2017, with the majority of Project funding provided by this Bill. Per House Bill 2017, ODOT will present a Cost to Complete Report to the State Legislature prior to the programming of State funding.

8.6.1.7 OR 217 Project

OR 217 carries up to 120,000 vehicles a day and has 10 interchanges in just over seven miles of highway, with some of the shortest interchange spacing in the region. This causes significant bottlenecks, leading to high crash rates and unpredictable travel times. HB 2017 allocated a majority of funding needed to implement highway improvements on OR 217. ODOT is currently in the design phase and construction is slated to begin in 2020.

The primary project elements include:

- Build auxiliary lanes on OR 217 southbound from Beaverton-Hillsdale Highway to Greenburg Road and on OR 217 northbound from OR 99W to Scholls Ferry Road.
- Build a collector-distributor road between Allen Boulevard and Denney Road interchanges along OR 217 southbound. The project removes the weaving section on southbound OR 217 between the Allen Boulevard and Denney Road interchanges by replacing the southbound entrance ramp from Allen Boulevard and the southbound exit ramp to Denney Road with a collector-distributor road connecting the Allen Boulevard and Denney Road southbound ramp terminals. Consolidation of these interchanges into a “split diamond interchange” configuration is consistent with previous corridor plan recommendations.
- Replace one of the Hall Boulevard bridges over OR 217. This is the southernmost bridge at SW Pfaffle Street (near OR 99W in Tigard). The bridge replacement is needed to accommodate the new auxiliary lanes.

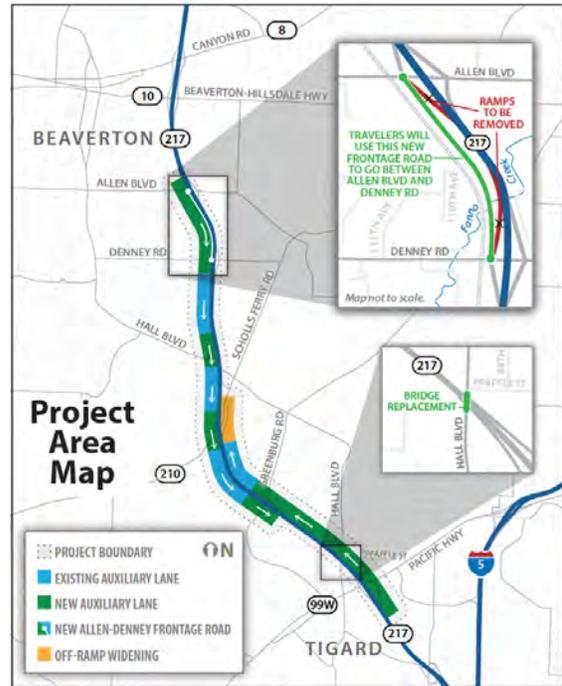


Figure 8.11 OR 217 Project Area Map

Anticipated Benefits

- Provide significant operations and safety improvements on OR 217 southbound
- Improve safety on a hazardous cargo route
- Reduce congestion/delay for all southbound travelers

8.6.1.8 I-205 South Corridor Widening and Seismic Improvements Project

Preliminary design work is underway to widen I-205 between OR 213 and Stafford Road and improve the I-205/Abernethy Bridge to ensure it remains functional after a catastrophic earthquake. The design work was funded through HB 2017; however, construction funding for this project has not been identified.

The I-205 South project widens I-205 to add a third lane in each direction between Stafford Road and OR 213 and an auxiliary lane across the Abernethy Bridge in each direction. The I-205/Abernethy Bridge project provides for seismic upgrades of the Abernethy Bridge and includes seismic retrofit or replacement of eight additional bridges in the corridor. The project also adds Active Traffic Management System improvements, such as Traveler Information Signs, throughout the corridor.

The Oregon Transportation Commission approved a Cost to Complete Report for the project that was shared with the Oregon Legislature in January 2018, as mandated by HB 2017. The Cost to Complete Report defines the project scope and recommends a project delivery method and phasing plan to complete the project by 2025. Read the report and find more project information at www.i205corridor.org.



Figure 8.12 I-205 South Widening and Seismic Improvements Project Area Map

8.3.2 Metropolitan Transportation Improvement Program

The Metropolitan Transportation Improvement Program (MTIP) documents how all federal transportation money is spent in the greater Portland region for a four-year period as well as state- and locally-funded projects that may significantly affect the region's air quality. The MTIP serves multiple purposes – the document:

- lists all federally-funded transportation expenditures;
- identifies funding sources for transportation projects;
- provides project implementation details (e.g., in what year the preliminary engineering, right-of-way acquisition and construction phase is expected);
- demonstrates all federal requirements to expend federal funds have been met; and
- reports how adopted regional policies influenced the selection of these near-term investments as priorities to move forward.

This section describes the role of the MTIP as a key tool for implementing the RTP, and the expectations of jurisdictional partners in demonstrating consistency with the RTP in order to be programmed in the MTIP for implementation.

MTIP Responsibilities and Oversight

Metro has the responsibility to prepare the MTIP, but it is done in collaboration and coordination with ODOT, and transit agencies, TriMet and SMART, as the region's four entities responsible for administering federal transportation funding. Additionally, cities, counties, the Port of Portland, other local agencies and the public participate in the development of the MTIP.

JPACT, the Metro Council and the Governor of the State of Oregon approve the MTIP. The MTIP is then incorporated, without change, into the State Transportation Improvement Program (STIP), which integrates regional and statewide improvement plans.

The Role of the MTIP in Regional Planning

The RTP plays a significant guiding role for the MTIP as it sets the policy direction for what transportation investments are eligible for federal funding and the prioritization criteria for allocating federal funding. Through inter-regional coordination throughout the planning and programming process, the MTIP ensures that investments of federal funds are consistent with regional objectives. The MTIP is updated every three years.

One of the primary purposes of the MTIP is to ensure scarce federal transportation investments are making progress towards the regional vision set out for transportation system in the RTP. As a result, the greater Portland region's MTIP gives top priority to strategic transportation investments that leverage and reinforce the compact urban form and expanded travel options envisioned in the 2040 Growth Concept and RTP.

Demonstrating Consistency Prior to Implementation

As the vehicle for implementing the RTP, the MTIP has two primary purposes:

1. ensure all federal requirements for expending federal transportation funds are being met; and
2. ensure the investments are making progress towards regional goals, objectives and implementing regional policies.

Recognizing these two primary purposes of the MTIP, any investment requiring inclusion in the MTIP must demonstrate and justify how the investment is consistent with the RTP and regional policy outcomes. This is necessary to meet federal eligibility and compliance purposes, provide the best transportation experience possible for the region's residents, businesses, employees and visitors and for good stewardship of scarce transportation resources.

The determination and demonstration of consistency with the RTP, done through the MTIP process, comprises quantitative and qualitative evidence that the investment meets requirements of regional policy (in design, purpose, transportation need being addressed and outcome), financial constraint, project performance towards regional and federal performance targets, and public involvement and consultation. In general, there are two main avenues to demonstrate consistency with the RTP before an individual transportation investment or an entire package of transportation investments may be included in the MTIP. The two avenues include the following:

1. During the prioritization process to allocate federal transportation dollars to various transportation projects (prior to the submission to the MTIP); and
2. The process for amending the MTIP.

As each four-year MTIP is developed, determination of consistency is also conducted and demonstrated programmatically.

The following sections describe the core areas that MTIP investments (at individual scale and during the funding allocation process) are required to demonstrate consistency with federal requirements and adopted regional transportation policy as expressed in the RTP goals, objectives and policies. Example questions are provided to illustrate what information is sought.

Regional Significance

The adopted RTP represents the regional transportation system in the greater Portland region, which serve regional transportation needs and provides a specified level of seamless multimodal connectivity, accessibility, and management of people and goods traveling on the system. As a result, the limited amount of available federal funding must be allocated strategically to advance the operation or enhance the development of key facilities across the different modal systems (e.g., transit, bicycle and pedestrian active transportation, freight) to ensure an interconnectivity while supporting other desired regional outcomes (travel options, reduced greenhouse gas emission, etc.).

For the purposes of demonstrating consistency, the RTP has identified these key facilities, programs, and strategies in defining the regionally significant system. Additionally, other conditions and circumstances may qualify a transportation investment as regionally significant. These will be outlined in Appendix T, reflecting the RTP definition of regional significance in Chapter 3. Examples of questions asked for transportation investments to demonstrate Regional Significance:

- Is the transportation investment advancing a project on a facility designated in one or more RTP system maps?
- Does the transportation investment require any form of permission or approval(s) from the U.S. DOT or other federal agency (Department of Natural Resources, Army Corps of Engineers, etc.) either at the regional (transportation system conformity) or project level (NEPA)?

Regional Goals and Objectives

The adopted RTP demonstrates a significant need for investment in the transportation system to address many growing demands of the transportation system, including the growing backlog of maintenance, expansion of services, and increased connectivity and completeness of different modes. Recognizing the scarcity of funding while the need for investment is ever growing, each dollar invested in the regional transportation system must serve a regional purpose and advance the implementation of the region's transportation vision and supporting goals, objectives and policies.

To be included in the MTIP, investments must demonstrate how implementation will address one or more of the RTP's goals, objectives and policies, listed in Chapters 2 and 3. The RTP's goals serve as the broad direction and expectation of what each investment in the system should aim to achieve. These goals are consistent with the federal planning factors issued by U.S. DOT.

Examples of questions asked for investments to demonstrate consistency with Regional Goals and Objectives include:

- What regional goals and objectives are being addressed by this transportation investment?

- Is the project identified as part of the adopted RTP financially constrained project list?
- Is the project advancing one or more of the Climate Smart Strategy policies? If so, which policy(ies) and how?
- Is this project addressing and/or advancing a strategy or action within an adopted regional modal or topical strategy or plan, or shared strategy of the RTP? If so, which modal or topical strategy or plan? Which strategy (or strategies) and action(s)? How does it address or advance the modal or topical strategy or plan?

Demonstrating Fiscal Constraint

As a federal requirement, both the RTP and the MTIP are fiscally constrained. Project costs are not to exceed expected revenue sources. For the MTIP, transportation identified investments are only those projects for which resources are expected to be available, and funding identified for the first year must be committed by administering agencies to the project. The MTIP is not a comprehensive accounting of all transportation investments in the region; it only accounts for the funding of regionally significant projects and does not include projects on local streets and facilities. Projects that are 100 percent locally funded but of regional significance are included for informational and analysis purposes only.

Per federal regulations, transportation projects using federal funds are expected to demonstrate that revenues needed to deliver the project are available and the revenues were accounted for in long-range transportation plan revenue projections. Therefore, projects included in the MTIP must be included in the RTP financially constrained project list either as an identified individual project or through a programmatic category. Additionally, projects in the MTIP must be consistent in scope and financial scale as to what was reflected in the financially constrained RTP project list. The revenue assumptions used to develop the RTP financially constrained project are defined in Chapter 5. Projects included in the RTP financially constrained project list are identified in Appendix A (2018-2027 time period) and Appendix B (2028-2040 time period).

In the event that projects proposed for funding and inclusion within the MTIP were not included in the RTP financially constrained project list at time of adoption, the RTP must be amended to include the project or projects as a condition of being adopted in the MTIP.

To amend projects into the financially constrained project list continued fiscal constraint must be demonstrated by identifying additional revenues or removing other projects from the financially constrained project list. More information about the process and other requirements that must be met to amend the RTP will be provided in Section 8.4 and Appendix T.

Examples of questions asked for transportation investments to demonstrate Fiscal Constraint:

- Is the transportation investment/project identified in the adopted RTP financially constrained project list?

- Is the project consistent in scope and cost as to what was accounted for in the RTP financially constrained project list and regional travel model?
- If this project is using federal dollars, how will the sponsoring agency adequately fund in perpetuity the operations and maintenance of the improvements being made?

Performance Targets (federal and regional)

Signed into law in 2012, the previous federal transportation reauthorization, known as 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.

For the first time, MAP-21 established a federal performance management framework 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 decisions. The objective of the performance management framework was to ensure states and MPOs invest federal resources in projects that collectively will make progress toward the achievement of the national goals. The required performance-based approach includes targets for measures specified by U.S. DOT and requirements to track and report progress toward meeting these targets. Twelve performance measures have been identified through MAP-21 and subsequent U.S. DOT rulemaking. These federal performance measures address:

- Safety
- Infrastructure Condition
- Congestion Reduction
- System Reliability
- Freight Movement and Economic Vitality
- Environmental Responsibility

Preceding the adoption of the MAP-21 performance-based planning requirements, Metro Council and JPACT adoption of the 2010 RTP established an outcomes-focused performance-based planning process that continues to today. The RTP performance-based process centers on measuring the performance of the adopted RTP investment strategy and monitoring progress towards 10 transportation system performance targets. A number of the RTP performance measures and targets are consistent with the MAP-21 measures and align to the eight federal planning factors required for MPOs to address and make progress towards.

To be included in the MTIP, transportation investments, planned for the region to meet growing demands, needs or deficiencies, must also demonstrate contribution to progress toward federal and RTP performance targets. The RTP performance management

framework and performance targets are outlined in Chapter 2, illustrate the performance targets for the plan. Examples of ways in which transportation investments can demonstrate consistency with Performance Targets:

- How does the transportation investment/project contribute one or more of the federal and/or regional performance targets for the transportation system
- What evaluation was performed to compare candidate projects for making progress toward federal and regional performance targets? What results can be provided to demonstrate the investment is making progress towards the federal and/or regional performance targets?
- How did the funding allocation process consider federal and regional performance targets in its criteria in the selection and allocation of funds?

Public Involvement Expectations and Process for Demonstrating Consistency

As part of federal guidance on public involvement and on Civil Rights laws and the Executive Order on Environmental Justice, it is expected that all transportation investments identified in the MTIP have provided, and will continue to provide opportunity for community input and comment until the investment is implemented and/or open for service. This means prior to an investment being identified in the MTIP, it must have emerged through planning process that was adopted or approved by a governing body and be included in the RTP investment strategy. The planning process, and that process's community engagement effort, indicates the investment addresses an identified transportation deficiency and need in the local community and the community has had opportunity to inform the plan. The adoption or approval of the plan must also provide an opportunity for public testimony.

Commonly recognized planning processes from which projects emerge include local transportation system plans (TSPs), but other planning processes include corridor studies, facility plans and sub-area plans. Additionally, through the development of the RTP project list, local jurisdictions are asked to self-certify transportation investments being proposed for the long-range transportation plan have undergone or are currently undergoing public involvement efforts through an approved planning process.

Examples of ways in which transportation investments can demonstrate consistency with Public Involvement include:

- From which planning process does the transportation investment emerge from? What opportunities for public feedback were available as part of the process?
- How was feedback from the public incorporated into the development of the investment?
- What demographic assessment was done to identify communities of color, people with limited English proficiency, people with low income and other historically marginalized communities as stakeholders?

- Were all interested/affected stakeholders meaningfully engaged in the funding allocation prioritization and decision-making process?
- Were all interested/affected stakeholders meaningfully engaged prior to the request for programming a project into the MTIP? ⁶

Developing the MTIP

The MTIP development process is initiated by Metro with an update to the MTIP policies. The policies direct how the Joint Policy Advisory Committee on Transportation (JPACT) and the Metro Council intend to coordinate the funding allocation processes administered by Metro through the Regional Flexible Funds Allocation (RFFA) process and for funds administered by ODOT and public transit agencies – TriMet and SMART. The policy document also describes how the funding allocation processes address federal regulations for the allocation of federal transportation funds.

Projects seeking funding through the RFFA process must be included in the financially constrained Regional Transportation Plan project list. JPACT and the Metro Council consider the MTIP for final approval. Upon adoption by the Council, the MTIP is submitted to the Governor of Oregon for inclusion in the State Transportation Improvement Plan (STIP).

⁶ Interested and affected stakeholders means those members of the public affected or interested in transportation investment (or package of investment), as well as formal entities, such as natural resource agencies, emergency management agencies, tribal entities, etc. which may have interests or be affected by the implementation of the proposed transportation investment.

8.4 AMENDING THE REGIONAL TRANSPORTATION PLAN

Note: This section will be further updated during the public comment period to describe the process for requesting amendments and seeking approval by JPACT and the Metro Council between schedule updates to the plan. Appendix T will also be developed during the public comment period.

Metro updates the RTP every five years, as required by federal law for all MPO areas designated with air quality attainment status. However, between RTP updates, amendments to the RTP may be necessary. Amendments can be triggered by substantially modified project need, mode, function or general location or new regionally significant projects identified through plans or studies adopted through a public process, including local transportation system plan updates. A plan amendment could also be necessary if substantial changes in financial resources occur not anticipated during the 2018 RTP update process.

To initiate a plan amendment, a local agency, the Oregon Department of Transportation (ODOT), TriMet or SMART provides information to Metro outlining the specific amendment request along with a clear justification for the amendment or the source of the new funding. Appendix T includes an RTP amendment request form for agencies to use to initiate the amendment process. Metro staff review the request and determine how the request should be processed.

This section summarizes the types of amendments that process for making amendments to the plan between scheduled updates.

8.4.1 RTP Policy, System Map and Compliance Criteria Amendments

When Metro amends policies or system maps in Chapter 3 of this plan, it will evaluate and develop findings regarding consistency with the Regional Framework Plan and Statewide Planning Goals (and implementing rules). Decisions on amendments made at this level are land-use decisions for need, mode, corridor, general scope and function of a proposed project. Subsequent land-use decisions on final project design and mitigation of impacts will be needed prior to construction. Such analysis to evaluate impacts could lead to a “no-build” decision where a proposed project is not recommended for implementation, and would require reconsideration of the proposed project or system improvements. In some cases a corridor refinement plan may be recommended pending the scale and scope of the proposed project.

As such, amendments at this level shall be reviewed through the post-acknowledgement process. However, a decision on an amendment to the Regional Transportation Plan should not foreclose or appear to foreclose full and fair consideration of all relevant statewide planning goal issues at such time that specific projects and programs are adopted by a local jurisdiction.

It is Metro's responsibility to adopt findings based on project need, mode, corridor, general scope and function of projects proposed in the Regional Transportation Plan. The affected jurisdiction is responsible for preparing the specific local plan amendments and findings related to specific location, project design and impact mitigation and for scheduling them for a public hearing before the governing body for action by that body by the time required.

8.4.2 RTP Project Amendments

The RTP establishes a comprehensive policy direction for the regional transportation system and recommends a balanced program of transportation investments to implement that policy direction. However, the recommended investments do not address all of the region's identified transportation needs for the next 20+ years.

Rather, the RTP identifies the projects, programs or future planning and refinement work required to adequately meet regional transportation system needs during the planning period. Regional system needs are those on the regional arterial and throughway, freight, transit, bicycle, and pedestrian networks as defined and mapped in Chapter 3 of the RTP. Local transportation needs and solutions are addressed through city and county Transportation System Plans (TSPs) and studies, and involve additional analysis and improvements to provide an adequate local transportation system. This section anticipates future local and regional planning and defines a process for making amendments to the RTP to address regional transportation needs. Similarly, revisions to the RTP may result from multimodal corridor refinement plans, NEPA studies or other area plans or studies adopted through a public process.

The following processes may be used to amend the RTP between scheduled updates to include these changes:

1. **Major project amendments:** These are amendments that come from NEPA processes, corridor refinement planning as defined by the Transportation Planning Rule or other studies and involve additions or deletions of projects or a significant change in the mode, function or general location of the project. Such amendments require adoption by JPACT and the Metro Council by Ordinance, accompanied by findings:
 - (a) demonstrating consistency with the RTP goals, objectives and policies and RTP modal function(s) of the facility as defined in Chapter 2 and 3;
 - (b) describing the consideration of transportation strategies as described in Metro Code section 3.08.220.A,
 - (c) demonstrating fiscal constraint; and
 - (d) demonstrating the public process used to define and adopt the project is consistent with Metro's adopted Public Engagement Guide and RTP amendment procedures.

2. **Project amendments resulting from adopted local TSPs, area plans, concept plans or studies adopted through a public process:** New roadway, transit, bikeway, pedestrian, freight and demand and system management projects on the regional system shall be adopted by JPACT and the Metro Council by Ordinance, accompanied by findings:
 - (a) demonstrating consistency with the RTP goals, objectives and policies and RTP modal function(s) of the facility as defined in Chapter 2 and 3;
 - (b) describing the consideration of transportation strategies as described in Metro Code section 3.08.220.A,
 - (c) demonstrating fiscal constraint; and
 - (d) demonstrating the public process used to define and adopt the project is consistent with Metro’s adopted Public Engagement Guide and RTP amendment procedures.Operations, maintenance and safety improvements are deemed consistent with the policy intent of the RTP if (a) they are needed to serve the travel demand associated with Metro’s adopted population and employment forecasts, and (b) they are consistent with affected jurisdictional plans.
3. **Other amendments** resulting from updates to the Regional Framework Plan or related functional plans.

Figure 8.X (*to be added to final RTP*) illustrates the process for amending the Regional Transportation Plan between scheduled updates, information required to demonstrate consistency with federal requirements, including fiscal constraint, RTP public engagement requirements and regional transportation policy as expressed in the RTP goals, objectives and policies in Chapters 2 and 3. Appendix T provides a checklist and related information for requesting RTP project amendments.

8.5 DATA AND TOOLS

This section summarizes data and research activities to address existing and emerging planning and policy priorities and innovative practices in transportation planning and analysis and ensure that the region has the resources to fulfill its transportation performance measurement and reporting responsibilities.

8.5.1 Data Collection and Coordination

This section summarizes data collection and coordination to support regional transportation planning and analysis, including regional travel model calibration and validation, and federal congestion management process analysis and performance based planning target setting and monitoring. The majority of our data is maintained in Metro's Regional Land Information System (RLIS). This database is comprised of over 150 different (primarily geospatial) data sets, and most of the data sets identified in the sections below are elements. Metro publishes RLIS on a quarterly basis, but many data sets are on different cycles and come from different sources. All data sets are available for review at <http://rlisdiscovery.oregonmetro.gov>, along with a date of last publication. The associated metadata should be consulted in advance to understand how the data were generated and to determine the appropriateness of its use.

8.5.1.1 Growth Data

Metro Research Center will continue to refine its recently developed Land Development Monitoring System (LDMS) as a component of the Regional Land Information System (RLIS). LDMS tracks the location and cost of residential and employment land utilization to inform regional growth and transport planning. Metro will work to enhance LDMS and RLIS with more equity-related data.

8.5.1.3 Travel Activity Data

Metro Research Center staff will lead coordination efforts for the next regional travel behavior survey (anticipated for 2022). Additional research will be necessary to ensure that the survey will capture traditionally relevant as well as emerging behavior (e.g., extent of Uber/Lyft utilization in place of other travel modes), and be conducted in a comprehensive and cost-effective manner.

New and emerging data collection methods (e.g., Sidewalk Labs Replica data, longitudinal or rolling surveys, mobile phone apps, personal GPS devices, etc.) will also be investigated to help ensure that the survey effort is well positioned to capture rapidly changing trends in personal travel behavior. Metro will partner with other Oregon modeling agencies (via the Oregon Modeling Steering Committee) as well as the Southwest Regional Transportation Council to maximize the geographic span and cross agency utility of the data.

8.5.1.4 Transportation Safety Data

Metro staff will coordinate with federal, state, regional and local partners to acquire, collect and maintain the data currently used for transportation safety related analysis. This data includes, but is not limited to, crash data provided by the Oregon Department of Transportation, and roadway network, traffic volume and vehicle mile traveled data. Additionally, new data required to provide more in-depth analysis will be pursued, including race and ethnicity of crash victims, posted speed data, and better bicycle and pedestrian count data.

8.5.1.5 Multi-Modal Network Data

Metro Research Center will continue to update multimodal data in the Regional Land Information System (RLIS). RLIS street centerlines and off-street trails networks are updated quarterly and comprise the basis of the multimodal network. Inventories of sidewalks and bike facilities are tied to these networks to allow for multimodal analysis. Sidewalks and bike facility inventories are updated as new data become available.

8.5.2 Analysis Tool Maintenance and Enhancement

This section summarizes planned maintenance and enhancement of the regional travel model, MetroScope and MOVES to address existing and emerging planning and policy priorities and innovative practices in regional transportation planning and analysis.

8.5.2.1 Growth Forecast

Metro Council has committed to making its next Urban Growth Boundary decision by the end of calendar 2018. That decision will adopt a Regional Economic Forecast of total future jobs and employment. Upon adoption of those regional control totals Metro will work to create the next generation Distributed Forecast (the Traffic-Analysis-Zone-level growth forecasts used in transportation planning and forecasting). The Distributed Forecast (likely to be released in 2019) will be available to support future MTIP and RTP update cycles.

8.5.2.2 Growth Forecast Tools

Metro Research Center is working to scope and implement enhancements or replacements for the MetroScope land use allocation model in time for the anticipated 2024 Urban Growth Management cycle, and will consider a wide variety of traditional and next-generation tool options. This work will directly improve the means of producing future Distributed Forecasts.

8.5.2.3 Regional Transportation Model Tools

Metro staff will continue to maintain and enhance the current trip-based travel model. Future activities include updating the simulation networks to reflect conditions for a 2020

base year, expanding the transit networks to cover the entire day, revisiting the bicycle assignment algorithm, revising the model that estimates external traffic and incorporating the new freight model. Metro staff will stay current with updated versions of the EPA's Motor Vehicle Emission Simulator (MOVES) for estimating criteria air pollutants, greenhouse gases and air toxics.

8.5.3 Analysis Tool Development

This section summarizes development of new analysis tools to address existing and emerging planning and policy priorities and innovative practices in regional transportation planning and analysis, including visualization tools, housing and transportation cost tool, project-level evaluation, piloting the multi-criteria evaluation (MCE) tool, and crash prediction modeling tools.

8.5.3.1 Regional Activity-Based Model

Key efforts during 2018-2019 will include the development of staff expertise, model validation and sensitivity testing, and the derivation/implementation of a tool acceptance program for the Activity-based Travel Demand Model. Given the rapidly changing personal travel landscape, it will be critical to ensure that the activity-based model framework is analytically positioned to overcome the methodological shortcomings of the current trip-based model and can be adapted to explicitly represent evolving travel behavior (e.g., travel via Uber/Lyft) or new near-horizon advances in technology (e.g., connected and automated vehicles). Research Center staff will coordinate closely with Metro planning to ensure that activity-based model framework is analytically aligned with anticipated policy questions.

8.5.3.2 Regional Freight Model

Development of the new freight model will be completed during the spring of 2018. Work will continue to integrate the model with the trip-based and activity-based passenger models. Modeling staff will continue to coordinate closely with Metro planning to ensure that new freight model is able to answer the analytical questions posed from the freight planning perspective (e.g., type and value of commodities by corridor and facility).

8.5.3.3 Multi-Criterion Evaluation Toolkit

Phase II of Multi-Criterion Evaluation (MCE) Toolkit development is anticipated to conclude by the end of 2018. Phase II scope will add travel demand model and MCE toolkit workflow enhancements; test each benefit and test a bundle of benefits together in one scenario; improve methods for measures such as safety, physical activity and auto ownership benefits; incorporate stakeholder outreach support; and upgrade the visualizer to be fully-featured and web-accessible. A key analytical feature of the MCE toolkit is its ability to identify potential benefits and/or impacts that have implications for equity

considerations. Modeling staff will coordinate with Metro planning staff to ensure that the MCE continues to be fine-tuned and ready to address policy questions related to equity.

8.5.3.4 Housing and Transportation Expenditure Tool

In recent collaboration with the Planning Department, the Metro Research Center developed a prototype of a Housing and Transportation Expenditure tool. The prototype tool looks at out-of-pocket expenditure for housing and transportation and looks at the effects of future transportation investments and the housing and transportation expenditures that result. Both current and forecast states of the regional land markets and transport system will be represented. The prototype will undergo further development, testing and refinement in anticipation of application during the next MTIP process and RTP update.

8.5.3.5 Economic Value Atlas Decision-Support Mapping Tool

Development of the Economic Value Atlas (EVA) is establishing tools and analysis that align planning, infrastructure, and economic development to build agreement on investments to strengthen our economy. Phase III of the Economic Value Atlas decision-support mapping tool is anticipated to conclude by the end of 2018.

This work:

- Provides new mapping and discoveries about our regional economic landscape.
- Links investments to local and regional economic conditions and outcomes.
- Informs policy and investment – providing a foundation for decision-makers to understand the impacts of investment choices to support growing industries and create access to family-wage jobs and opportunities for all.

The EVA will provide a solid data foundation for key regional activities such as:

- outlining a path to pursue policy, actions and investment that help secure these outcomes;
- defining potential areas for partners to collaborate and develop shared investment strategies;
- pinpointing areas of focus for regional investment to bridge local and regional economic development aspirations; and
- providing a data 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.

This work will support regional transportation planning and investment decisions by:

- Highlighting key intersects between transportation + economic conditions that can guide project prioritization criteria incorporated into the next 3-year RFFA cycle.

- Building a granular understanding of relative economic strengths and challenges among communities in the region to inform local Transportation System Plans and area studies, regional investment areas and corridor refinement planning and planning studies, and advance more strategic transportation project prioritization and investment based on surrounding economic conditions.
- Supporting multiple applications by ongoing regional programs in Metro’s Planning and Development Department.

8.5.3.6 Displacement Monitoring Tool

Historically marginalized communities engaged in the 2018 RTP update raised Involuntary displacement as a key priority for the 2018 RTP transportation equity system evaluation during the scoping process. More specifically, historically marginalized communities desired to understand the potential displacement impacts to result in investment as well as what proactive mitigation strategies may be put into effect in advance to address the displacement risk. Through the 2018 RTP transportation equity system evaluation method development, it was determined the investment scenario analysis would not be able to look at displacement risk due to the limitations of the forecasting tool.

Nonetheless, in an effort to honor the input and recognize the concern about displacement risk from public investment in the transportation system, a recommendations from the 2018 RTP transportation equity system evaluation emerged to develop a streamlined displacement risk tool, which can help inform plans, project designs, and other components of transportation investment. Through the Southwest Equitable Development Strategy (SWEDS), a displacement risk assessment is underway and the method developed for this assessment will inform development of a displacement risk monitoring tool in the future.

8.5.3.7 Crash Prediction Modeling Tool

Better understanding and evaluation of how projects, programs and strategies impact transportation safety system wide is a key element to effectively planning for safety and achieving Vision Zero. Metro staff will coordinate with federal partners and other MPOs to develop and pilot the use of crash prediction modeling tools to assess safety performance system wide.

8.5.4 Monitoring and Reporting Tools

This section summarizes information systems and data resource coordination efforts that Metro is doing or will do to ensure that the region has the resources to fulfill its transportation performance measurement and reporting responsibilities.

8.5.4.1 Monitoring Data and Information Systems

Metro Research Center staff will continue to investigate new and emerging data sources and data collection methods (e.g., Sidewalk Labs Replica, HERE, longitudinal or rolling surveys, mobile phone apps, personal GPS devices, etc.) to help ensure that Metro is well positioned to capture rapidly changing trends in personal travel behavior in a timely fashion. Research Center staff anticipates participating in a pilot project, along with other regional partners, to acquire and test Sidewalk Labs Replica data during FY 2018-19. The pilot will help determine the viability and versatility of “big” data sources for research, model development and monitoring activities. Research Center staff will also continue to collect and process HERE data for federally-required performance monitoring purposes.

8.5.4.2 Congestion Management Program Data Collection and Monitoring

This section summarizes the region’s approach to monitoring and reporting on the progress implementing the RTP, regional Congestion Management Process (CMP), federal transportation performance-based planning and programming, Climate Smart Strategy, and State Implementation Plan.

The great challenge for establishing and maintaining a monitoring program has been the availability of data. Historically, collecting and managing data has been expensive and difficult. With advancements in intelligent transportation systems in the region, more and better data is available today and will continue to grow with implementation of data collection projects identified in the Regional Transportation System Management and Operations (TSMO) plan.

Starting in 2008, the region approved ongoing funding for implementation, including an annual allocation to fund Portal, the regional transportation data archived, housed and maintained by Portland State University. PSU, in partnership with ODOT, TriMet, Metro and other local agencies, provides data aggregation, maintenance and reporting on the region's roadways and transit systems. Metro will continue to work with ODOT and other regional partners to expand existing data collection and performance monitoring capabilities, in order to evaluate system performance for all modes of travel.

This work includes supporting a data management system to facilitate data collection, maintenance and reporting to support on-going RTP and MTIP monitoring. The performance monitoring will be reported biennially as part of the Regional Mobility Program, consistent with the region’s federally approved congestion management process.

Congestion Management Process

Congestion management is the application of strategies to improve transportation system performance and reliability by reducing the adverse impacts of congestion on the movement of people and goods. A congestion management process (CMP) is a systematic objectives-driven approach for managing congestion that provides accurate, up-to-date information on transportation system performance for all modes of travel. The process

assesses alternative strategies for managing congestion and enhancing the reliability and mobility of people and goods to meet local, regional and state needs. These multimodal strategies include, but are not limited to, operational improvements, travel demand management, policy approaches, and additions to capacity. The CMP, as defined in federal regulation (23 CFR 450.320(c)2), is intended to move these congestion management strategies into the funding and implementation stages.

A CMP is required in metropolitan areas with greater than 200,000 people – known as Transportation Management Areas. Federal requirements also state that in all TMAs, the CMP shall be developed and implemented as an integrated part of the metropolitan transportation planning process such that CMP strategies are reflected in the long-range regional transportation plan (RTP) and Metropolitan Transportation Improvement Program (TIP).

The goal of the region’s CMP is to provide for the safe and effective management and operation of new and existing transportation facilities through the combination of reducing drive alone trips, increasing transit ridership, bicycling and walking, supporting freight mobility and expanding the use of operational system management and demand management strategies.

The Regional Transportation Plan calls for strategic widening of existing roads and throughways to address congestion bottlenecks, increasing street network connectivity, expanding travel options, and using system and demand management strategies to help improve reliability and better connect goods to market and support travel across the region. The RTP defines a planned regional motor vehicle system of throughways and arterials. Throughways are planned as six-lane facilities (three through lanes in each direction), with on- and off-ramps and auxiliary lanes between ramps, as needed. Arterials are planned as four-lane facilities (two through lanes in each direction, with turn lanes and bike and pedestrian facilities. Prior to adding new motor vehicle capacity beyond the planned system of arterial and throughway through lanes, this region’s CMP (and RTP policies) require an analysis of travel demand reduction and operational management strategies along with planned transit service and multimodal connectivity improvements to demonstrate these strategies cannot adequately address arterial or throughway deficiencies and bottlenecks.

The region’s CMP seeks to address current and future congestion challenges through an eight-step process.

Table 8.3 lists the CMP steps and how the region’s planning and investment activities implement the CMP.

Table 8.3 Regional Congestion Management Process (CMP)

Steps in the Congestion Management Process	Associated RTP/MTIP Activities
Step 1: Develop congestion management objectives and policies	RTP (Chapter 2 and Chapter 3), Regional Transportation System Management and Operations Action Plan, and Regional Travel Options Strategy
Step 2: Identify geographic area of application and regional transportation networks of interest	RTP (Chapter 3) and Mobility Corridor Atlas
Step 3: Establish multimodal performance measures	RTP Performance Targets (Chapter 2) and Performance Evaluation (Chapter 7)
Step 4: Collect data and monitor system performance	RTP Existing Conditions (Chapter 4), ODOT Traffic Performance Report ⁷ and Mobility Corridor Atlas
Step 5: Analyze congestion problems and needs	RTP Performance Evaluation (Chapter 7), ODOT Traffic Performance Report
Step 6: Identify and evaluate effectiveness of strategies	RTP and Mobility Corridor Atlas
Step 7: Implement selected strategies and manage transportation system	MTIP, local jurisdictions, ODOT, TriMet and SMART
Step 8: Monitor strategy effectiveness ⁸	Mobility Corridor Atlas

The RTP and MTIP are the region’s performance-based planning and programming framework for CMP implementation. The CMP is also implemented by local jurisdictions, as required by the Regional Transportation Functional Plan, section 3.08.220, and the Oregon Department of Transportation and transit providers – TriMet and SMART. The RTP mobility corridors identify the geographic area and regional transportation networks of interest, which include the regional motor vehicle network as well as regional networks for freight, transit, bike and pedestrian travel.

The RTP identifies congested areas and multimodal strategies to mitigate the congestion. In 2016, ODOT prepared a baseline report documenting congestion on the region’s throughway network that will be periodically updated and used to monitor congestion in support of the region’s CMP. Where more motor vehicle capacity is appropriate, the CMP will include additional system and demand management strategies to ensure the strategic investments in capacity are effectively managed to get the most value from the investment and support other goals and policies in the RTP. Where there are alternatives that can address congestion and enhance mobility, the CMP will identify those opportunities and needs.

⁷ ODOT, “2016 Traffic Performance Report.” (June 2017). Available on-line at http://www.oregon.gov/ODOT/Regions/Documents/Region1/2016_TPR_FinalReport.pdf

⁸ USDOT, “Guidebook on the Congestion Management Process in Metropolitan Transportation Planning.” Pg. 1-1 (April 2011).

Relying on the performance measures in the RTP, the CMP provides a framework for ongoing data collection and monitoring of system performance with the Mobility Corridor Atlas as the reporting vehicle. Data collected by the region to support the region's CMP is summarized in Section 8.5. The data is used to help assess various strategies for managing congestion by the region's partner agencies to implement appropriate strategies into ongoing or new projects in those corridors. As strategies are implemented, on-going CMP monitoring will determine the effectiveness of the improvements.

The region's CMP will continue to advance the goals of the RTP and strengthen the connection between the RTP and the Metropolitan Transportation Improvement Program (MTIP). The "Roadmap" of the region's CMP can be found in the Appendix L. The CMP roadmap is a living document, continually evolving to address the results of performance measures, concerns of the community, new objectives and goals of the region, and up-to-date information on congestion issues.

After the 2018 Regional Transportation Plan update, Metro, ODOT and other regional partners will work together to update the current regional mobility policy to better align with Regional Transportation Plan outcomes, public expectations, and funding availability. This work will be informed by the ODOT value pricing study underway and help the region develop long-term strategies to address growing roadway congestion, given limited transportation funding and potential social equity, environmental and community impacts. The region's CMP will inform this work and likely be updated as a result.

8.5.4.3 Greater Portland Pulse

Metro has been and continues to be engaged in an effort with PSU's Institute of Metropolitan Studies to deliver a coordinated regional approach to generating performance indicators that can provide a shared lens for tracking how the region is doing socially, economically and environmentally. The mission of this partnership is to use data and dialogue to encourage coordinated action.

For the economy, education, health, safety, the arts, civic engagement, environment, housing and transportation, the Greater Portland Pulse data shows where the region is successful and where it's lagging. The performance indicators are also a road map for public and private action and can inform investment decisions, such as those made through the RTP and MTIP and activities to implement the RTP and other regional policies and programs. More information on this project can be found at www.portlandpulse.org

Metro is expanding on these capabilities by developing a "regional barometer." This effort embraces changes in technology and user expectations by providing interactive mapping and data visualizations focused on Metro's Six Desired Outcomes for the region. It will utilize the Regional Land Information System (RLIS), the regional database that Metro curates and updates on an ongoing basis, upon which our planning policies are based.

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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.

Access Management Enables access to land uses while maintaining roadway safety and mobility through controlling access location, design, spacing and operation.

Action Discrete steps to make progress toward a desired outcome(s).

All Roads Transportation Safety (ARTS) Formerly known as the Jurisdictionally Blind Safety Program, is an Oregon Department of Transportation Program that is designed to address safety needs on all public roads in Oregon. The program’s goals are to: Increase awareness of safety on all roads; Promote best practices for infrastructure safety; Compliment behavioral safety efforts; Focus limited resources to reduce fatal and serious injury crashes in the state of Oregon. The program is data driven to achieve the greatest benefits in crash reduction and is blind to jurisdiction.

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.

Autonomous Vehicle (AV) Also known as a driverless car, self-driving car, robotic car, AVs use sensors and advanced control systems to operate independently of any input from a human driver. Transportation experts have developed a five-level system to distinguish between different levels of automation;ⁱ in this plan we focus on Level 4 or 5 AVs, which can operate independently under most or all conditions.

Auxiliary lane An auxiliary lane provides a direct connection from one interchange ramp to the next. The lane separates slower traffic movements from the mainline, helping smooth the flow of traffic and reduce the potential for crashes.

Best Practices For purposes of this document, the term “best practices” is used as a general term of preferred practices accepted and supported by experience of the applicable professional discipline. It is not prescriptive to a particular set of standards or a particular discipline.

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.

Bike share systems like Biketown in Portland make fleets of bicycles available for short-term rental within a defined service area. Some bike share systems now offer electric bikes.

Conventional bike share systems like Biketown in Portland are operated through exclusive agreements between a private company and a public agency, and in most cases users must pick up and leave bikes at designated stations, through Biketown and other modern systems also offer users the option of locking a bike anywhere within the service area. Fully **dockless** systems operated by companies such as Ofo, Limebike and Spin allow users to pick up and leave bikes (or electric scooters, which many companies now offer) within a defined service area and require less coordination between the public and private sector.

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.

Car share services allow people to rent a nearby vehicle for short trips and pay only for the time that they use. Different car share service types include:

- Stationary car share (ZipCar, in some cases ReachNow), under which cars are kept at fixed stations and users pick up cars from and return them to the same station.
- Free-floating car share (Car2Go, ReachNow), which allows people to pick up and drop off cars anywhere within a defined service area.
- Peer-to-peer car share (Getaround, Turo), which enables people to rent cars from their neighbors on a short-term basis.

Central city – Downtown Portland and adjacent areas (like Lloyd District) within the city of Portland.

Climate change Any change in climate over time, whether due to natural variability or as a result of human activity that persists for an extended period.

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.

Community places Key local destinations such as schools, libraries, grocery stores, pharmacies, hospitals and other medical facilities, general stores, and other places which provide key services and/ or daily needs.

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.

Connected vehicles (CVs) communicate with each other or with infrastructure like traffic signals and incident management systems. It seems increasingly likely that vehicles in the near future will be automated and may include some connected elements, we typically use “automated vehicles” to refer to vehicles that include a mix of automated and connected elements, and only use “connected vehicles” to distinguish connected from automated vehicles.

Connected vehicle (CV) infrastructure, such as traffic signals and roadside sensors, communicates information to CVs in order to help them navigate the transportation system safely and efficiently.

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.

Constrained budget The budget of federal, state and local funds the greater Portland region can reasonably expect through 2040 under current funding trends – presumes some increased funding compared to current levels.

Constrained list Projects that can be built by 2040 within the constrained budget

Context Sensitive Design A model for transportation project development that requires proposed transportation projects to be planned not only for its physical aspects as a facility serving specific transportation objectives, but also for its effects on the aesthetic, social, economic and environmental values, needs, constraints and opportunities in a larger community setting.

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.

Countermeasure An activity, initiative or design element to prevent, neutralize, or correct a specific safety problem.

Crash A violent collision, typically of one vehicle with another (vehicles include bicyclists, motorcyclists, freight trucks, school buses, transit buses, etc), a pedestrian, or with a stationary objects such as a pole or guard rail.

Data-Driven Safety Analysis Uses data to promote the integration of safety performance into all roadway investment decisions. Broader implementing of quantitative safety analysis so that it becomes an integral part of safety management and project development decision making in order to lead to better targeted roadway investments that result in fewer fatal and serious injury crashes. Decisions are compelled by data, rather than by intuition or by personal experience.

Deficiency – Capacity or design constraints that limit, but do not prohibit the ability to travel by a given mode or meet thresholds defined in Tables 2.4 (Regional Motor Vehicle Performance Measures) or 2.5 (Non-SOV Modal Targets). 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.

Electric vehicles (EVs) use electric motors for propulsion instead of or in addition to gasoline motors.

Emerging Technologies is a blanket term that we use throughout this plan to refer to new developments in transportation technology. We use it to refer both to technologies like automated vehicles or smart phones and services that operate using these technologies, like car and bike share.

Emergency Medical Services (EMS) The treatment and transport of people in crisis health situations that may be life threatening. Emergency medical support is applied in a wide variety of situations, including traffic crashes.

Employer-based commute programs Work-based travel demand management programs that can include transportation coordinators, employer-subsidized transit pass programs, ride-matching, carpool and vanpool programs, telecommuting, compressed or flexible work weeks and bicycle parking and showers for bicycle commuters.

Employment lands Areas of mixed employment that include various types of manufacturing, distribution and warehousing uses, and may include commercial and retail development. **Equity** See Racial Equity and Social Equity

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.

Equity Focus Areas Census tracts with higher than regional average concentrations and double the density of one or more of the following: people of color, English language learners, and/or people with lower income. Most of these areas also include higher than regional average concentrations of other historically marginalized communities, including young people, older adults and people living with disabilities.

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.

Forecast Projection of population, employment or travel demand for a given future year.

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.

Functional Classification The class or group of roads to which the road belongs. There are three main functional classes as defined by the United States Federal Highway Administration: arterial, collector, and local. Throughways and freeways fall under arterial in the federal classification system.

Goal States a desired outcome toward which actions are focused to make progress toward a long-term vision.

Greenhouse gas emissions The six gases identified by the Oregon Greenhouse Gas Mandatory Reporting Advisory Committee as contributing to global climate change: carbon dioxide (CO₂), nitrous oxide (N₂), methane (CH₄), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). More information is available at epa.gov/climatechange.

Health impact assessment A combination of procedures, methods, and tools by which a policy, program or project may be evaluated as to its potential effects on the health of a population, and the distribution of these effects within the population.

High Crash Location Highway or road segments identified by the frequency and severity of motor vehicle crashes. Identification of high crash locations is part of the safety problem identification process.

High Injury Corridors and Intersections (Metro) Roadways where the highest concentrations of fatal and severe injury crashes involving people in cars, biking and walking occur on the Regional Transportation Network. Corridors and intersections were analyzed to determine aggregate crash scores based on the frequency and severity of crashes, using the following methodology:

- Fatal and Injury A (serious) crashes for all modes are assigned to the network; "Injury B", "Injury C", and "PDO (property damage only)" crashes involving bikes and pedestrians are also assigned to the network.
- Fatal and Injury A crashes are given a weight of 10.
- Roadways are analyzed in mile segments; if a segment has only one Fatal or Injury A crash it must also have at least one B/C (minor injury) crash, for the same mode, to be included in the analysis.

- Roadway segments are assigned an N-score (or “crash score”) by calculating the weighted sum by mode and normalizing it by the roadway length. To reach 60 percent of Fatal and Severe Injury crashes, roadway segments had to have an N-score of 39 or higher; high injury Bicycle Corridors had to have an N-score of 6 or more, and high injury Pedestrian Corridors had to have an N-score of 15 or more. Intersections with the highest weighted crash scores were also identified; 5 percent of intersections had an N-score (or “crash score”) higher than 80 and are also shown on the map, and 1 percent of intersections (the top 1%) had to have an N-score higher than 128.

High Risk Roadways Characteristics of high risk roads are identified by looking at crash history on an aggregate basis to identify particular severe crash types (e.g. pedestrian) and then use the roadway characteristics associated with particular crash types (e.g. arterial roadways with four-or more lanes, posted speed over 35 mph, unlit streets) to understand which roadways may have a higher risk of the same type of severe crash.

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.

Historically Marginalized Communities Are communities of people that have been historically excluded from critical aspects of social participation including, voting, education, housing and more. Historical marginalization is often a result of systematic exclusion based on devaluation of any individual existing outside of the dominant culture. For purposes of the RTP, this includes people of color, people with limited English proficiency, people with lower-incomes, youth, older adults and people living with a disability.

Individualized marketing Travel demand management programs focused on individual households. IM programs involve individualized outreach to households that identify household travel needs and ways to meet those needs with less vehicle travel.

Induced demand Refers to the process whereby improvements in the transportation system intended to alleviate congestion and delay result in additional demand for the transportation segment, offsetting some of the improvement’s potential benefits. For instance, when a congested roadway is expanded from 2 to 3 lanes, some drivers will recognize the increased capacity and take this roadway though they had not done so previously.

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.

Level of service motor vehicle traffic flow characteristics

Rating	Characteristics
A	Virtually free flow; completely unimpeded
B	Stable flow with slight delays; reasonably unimpeded
C	Stable flow with delays; less freedom to maneuver
D	High density but stable flow
E	Operating conditions at or near capacity; unstable flow
F	Forced flow, breakdown conditions
>F	Severely congested - demand exceeds roadway capacity, limiting

Sources:1985 Highway Capacity Manual (A through F descriptions), Metro (>F description)

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 used 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.

Lower Income Focus Area Census tracts with higher than regional average concentrations and double the density of people with lower income. Lower income is defined as people with incomes below 200% of the federal poverty level (i.e., with incomes up to twice the level of poverty), as defined by the U.S. Census Bureau for 2016.

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 Area Boundary (MPA) The geographic area determined by agreement between the Metropolitan Planning Organization (MPO) and the Governor, in which the MPO conducts federally mandated transportation planning work, including: a long-range Regional Transportation Plan, the Metropolitan Transportation Improvement Program for capital improvements identified for a four-year construction period, a Unified Planning Work Program, a congestion management process, and conformity to the state implementation plan for air quality for transportation related emissions.

Metropolitan Planning Organization (MPO) – A regional policy body, required in urbanized areas by the **Fixing America’s Surface Transportation Act (Fast Act)** A funding and authorization bill to govern United States Federal surface transportation spending, signed by President Obama on December 4, 2015. It is subsequent to MAP-21, but does not replace all of the applicable requirements of that earlier law, so both must be referenced. 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.

Microtransit services such as Via, Chariot and Leap can differ from conventional transit service in several different ways:

- **Dynamic routing:** Some microtransit services operate on flexible routes to pick up and drop off riders nearer to their origins and destinations. Services may deviate from a fixed route to make pickups and dropoffs, crowdsource routes from data provided by riders or make stops anywhere within a defined service area.
- **On-demand scheduling:** Instead of operating on a fixed schedule, microtransit services may allow riders to request a ride when they need it.
- **Smaller vehicles:** Microtransit services often use vans or small buses instead of 40-passenger buses.
- **Private operation:** Many microtransit services are privately operated or operated through partnerships between public agencies and private companies.

We distinguish between microtransit that is **coordinated** with public transit, for example services that connect people to high-frequency transit or operate in areas that are hard to serve with conventional transit, and **luxury** microtransit that serve existing transit routes and offer more space or amenities than a public bus at a higher cost.

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.

Motorcycle A motor vehicle with motive power having a seat or saddle for the use of the rider and designed to travel on not more than three wheels in contact with the ground. The NHTSA defines “motorcycle” to include mopeds, two or three-wheeled motorcycles, off-road motorcycles, scooters, mini bikes and pocket bikes.

Moving Ahead for Progress in the 21st Century Act (MAP-21) (P.L. 112-141) Reauthorization of Federal highway funding, signed into law by President Obama on July 6, 2012. Subsequent adoption of the FAST Act does not replace MAP-21 in all areas regulation of transportation safety planning and funding, so both must be referenced.

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.

New mobility services refers to transportation services like ride-hailing, microtransit and car and bike share, which operate using smart phones and other emerging technologies. Many of these services are privately operated by **new mobility companies**.

Objective (in a plan) Identifies a measureable desired outcome and means for achieving a goal(s) to guide action within the plan period.

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.

Older Adults (vulnerable) The Moving Ahead for Progress in the 21st Century (MAP-21) Act created a new Special Rule for older drivers and pedestrians under 23 USC 148(g)(2), which was continued under the Fixing America's Surface Transportation (FAST) Act. If the rate per capita of traffic fatalities and serious injuries for drivers and pedestrians over the age of 65 in a State increases over the most recent 2-year period, this Special Rule requires a State to include strategies to address the increases in those rates in their State Strategic Highway Safety Plan (SHSP). FHWA

issued the Section 148: Older Drivers and Pedestrians Special Rule Final Guidance in May 2016.¹ TriMet's Coordinated Transportation Plan for Seniors and Persons With Disabilities identifies several principles and actions related to addressing safety and security concerns getting to, at transit stops and on transit.

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.

Parking management Strategies that encourage more efficient use of existing parking facilities, improve the quality of service provided to parking facility users, and improve parking facility design. Examples include developing an inventory of parking supply and usage, reduced parking requirements, shared and unbundled parking, parking-cash-out, priced parking, bicycle parking and providing information on parking space availability. More information can be found at vtpi.org/park_man.pdf

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.

¹ U.S. Department of Transportation, Federal Highway Administration Older Drivers and Pedestrians Special Rule. <https://safety.fhwa.dot.gov/hsip/older/>

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.

Per Capita Or, per person. Used to describe crash rate per population. Except where otherwise noted, crash rates are per million residents in this document.

Per Vehicle Miles Traveled (VMT) Is used to describe rate of something per the number of motor vehicle miles traveled, such as the crash rate per motorized vehicle miles. Except where otherwise noted, crash rates are per 100-million motorized vehicle miles travelled in this document.

People of Color Focus Area Census tracts with higher than regional average concentrations and double the density of one or more of the following: people of color and/or English language learners.

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.

Policy A policy is a statement of intent and describes a direction and a course of action adopted and pursued by a government to achieve desired outcome(s).

Posted Speed The speeds indicated on signs along the roadway. When speeds differ from statutory speeds there must be a posted sign indicating the different speed.

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).

Protected Bike Lanes (separated bike lane, cycle track) A bike lane that is physically separated from auto traffic, typically they are created using planters, curbs, parked cars, or posts and are essential for creating a complete network of bike-friendly routes. For bicyclists, safety increases significantly when there is physical separation from motorists through infrastructure. Fully protected bikeways can reduce bicycle injury risk up to 90 percent.² Another report found that on-street bike lanes that use barriers to physically separate bicyclists from motor vehicles are 89 percent safer than streets with parked cars and without bicycling infrastructure. When physical separation is not possible, infrastructure such as striped bike lanes, bicycle boulevards, and bike boxes help reduce the risk of conflict with motor vehicles.³

Public Health The health of the population as a whole, especially as monitored, regulated, and promoted by the state.

Racial Equity When race can no longer be used to predict life outcomes and outcomes for all groups are improved. The removal of barriers with a specific focus on eliminating disparities faced by and improving equitable outcomes for communities of color – the foundation of Metro’s strategy with the intent of also effectively identifying solutions and removing barriers for other disadvantaged groups.

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

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 mobility policy Describes operational conditions that are used to evaluate the quality of service of the motor vehicle network, using the ratio of traffic volume to planned capacity (referred to as the volume/capacity ratio) of a given roadway. The policy is used to diagnose the extent of

² “Route Infrastructure and the Risk of Injuries to Bicyclists: a Case-Crossover Study,” Teschke, et al. American Journal of Public Health, Vol. 102, No. 12, December 2012.

³ A Right to the Road, p.48, GHSA, 2017.

vehicle congestion during different times of the day in order to identify deficient roadway facilities and services. In 2000, JPACT and the Metro Council adopted the policy, agreeing that building a regional arterial and throughway network to accommodate all motor vehicle traffic during peak travel periods is not practical nor would it be desirable considering potential financial, social equity, environmental and community impacts. The RTP mobility policy can be found on page 2-20 of the 2014 Regional Transportation Plan.

Regional Transportation Plan (RTP) – A long-range transportation plan that is developed and adopted for the greater Portland metropolitan planning area (MPA) 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 implementing policies and 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; RSIA's 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.

Ride-hailing services (also known as transportation network companies, or TNCs) like Uber and Lyft use apps to connect passengers with drivers who provide rides in their personal vehicles.

Rideshare A transportation demand management strategy where two or more people share a trip in a vehicle to a common destination or along a common corridor. Private passenger vehicles are used for carpools, and some vanpools receive public/private support to help commuters. Carpooling and vanpooling provide travel choices for areas underserved by transit or at times when transit service is not available.

Road Users A motorist, passenger, public transportation operator or user, truck driver, bicyclist, motorcyclist, or pedestrian, including a person with disabilities. (23 USC section 148)

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

Safety (in transportation) Protection from death or bodily injury from a motor-vehicle crash through design, regulation, management, technology and operation of the transportation system.

Safety Benefit Projects (in the Metro Regional Transportation Plan) Projects with design features to increase safety for one or more roadway user. These projects may not necessarily address an identified safety issue at an identified high injury or high risk location, but they do include design treatments known to increase safety and reduce serious crashes. Examples include adding sidewalks, bikeways, medians, center turn lanes and intersection or crossing treatments.

Safety Project (in the Metro Regional Transportation Plan) Has the primary purpose reducing fatal and severe injury crashes or reducing crashes by addressing a documented safety problem at a documented high injury or high risk location with one or more proven safety counter measures.

Safe Routes to School A comprehensive engineering/education program focused on youth school travel that aims to create safe, convenient, and fun opportunities for children to walk and roll (bike, scooter, etc.) to and from schools. City or school district based programs incorporate evaluation, education, encouragement, engineering, enforcement, and equity with the goal of increasing walking and rolling to school.

Safe System Approach A data-driven, strategic approach to roadway safety that aims to eliminate fatal and severe injury crashes. The approach is based on a foundational understanding of the underlying causes of traffic fatalities and severe injuries (using data) and is based on the principle that errors are inevitable but serious crashes should not be. Transportation safety policies that use a Safe System approach include Vision Zero, Towards Zero Deaths, Road to Zero and Sustainable Safety.

Safe System Approach Speed Setting Speed limits are set according to the likely crash types, the resulting impact forces, and the human body's ability to withstand these forces. It allows for human errors (that is, accepting humans will make mistakes) and acknowledges that humans are physically vulnerable (that is, physical tolerance to impact is limited). Therefore, in this approach, speed limits are set to minimize death and severe injury as a consequence of a crash.

Safety Data Includes, but is not limited to, crash, roadway, and traffic data on all public roads. For railway- highway grade crossings, safety data also includes the characteristics of highway and train traffic, licensing, and vehicle data.

Security (public and personal) Protection from intentional criminal or antisocial acts while engaged in trip making through design, regulation, management, technology and operation of the transportation system.

Serious Crash In this document refers to the total number of Fatal and Severe Injury (Injury A) crashes combined.

Severity A measurement of the degree of seriousness concerning both vehicle impact (damage) and bodily injuries sustained by victims in a traffic crash.

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

Shared mobility describes services that allow people to share a vehicle, such as ride-hailing trips, car and bike share and microtransit, as well as traditional shared modes like transit, car- or vanpools and taxis. Some of these services are privately operated by **shared mobility companies**.

Shared trips are trips taken by multiple passengers traveling in a single vehicle, including carpools, transit trips and some ride-hailing or car share trips.

Smart cities refers to the way in which public agencies are using technology to collect better data, provide better service, do business more efficiently and make better decisions.

Social Equity The idea that all members of a societal organization or community should have access to the benefits associated with civil society – the pursuit of an equitable society requires the recognition that there are a number of attributes that give members of a society more or less privilege and that in order to provide equitable situations the impacts of these privileges (or lack thereof) must be addressed. For transportation, equity refers to fair treatment or equal access to transportation services and options. In the context of safety, transportation equity relates to improving the travel choices, the safety of travel and not unfairly impacting one group or mode of transportation. More specifically it means improved safety for all transportation options and lessening the risks or hazards associated with different choices of transportation.

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.

Strategic list Additional policy-drive transportation needs and priority projects that could be achieved with additional resources.

Strategy Involves setting goals, determining actions to achieve the goals, and mobilizing resources to execute the actions. A strategy describes how the ends (goals) will be achieved by the means (resources).

Strategic Plan Defines the desired direction and outcomes to guide decisions for allocating resources to pursue the strategy.

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.

System efficiency Strategies that optimize the use of the existing transportation system, including traffic management, employer-based commute programs, individualized marketing and carsharing.

Throughways Controlled access (on-ramps and off-ramps) freeways and major highways.

Toward Zero Deaths Is the United States' highway safety vision. The National Strategy on Highway Safety provides a platform of consistency for state agencies, private industry, national organizations and others to develop safety plans that prioritize traffic safety culture and promote the national Toward Zero Deaths vision. As a strategic policy it is similar to Vision Zero.

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.

Transportation management associations (TMA) Non-profit coalitions of local businesses

and/or public agencies, and residences such as condo Home Owner Associations all dedicated to reducing traffic congestion and pollution while improving commuting options for employees, residents and visitors.

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 Planning Rule (TPR) Oregon’s statewide planning goals established state policies in 19 different areas. The TPR implements the Land Conservation and Development Commission’s Planning Goal 12 (Transportation) which requires ODOT, MPOs, Counties and Cities, per OAR 660-012-0015 (2) and (3), to prepare a Transportation System Plan (TSP) to identify transportation facilities and services to meet state, regional and local needs, as well as the needs of the transportation disadvantaged and the needs for movement of goods and services to support planned industrial and commercial development, per OAR 660-012-0030(1).

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.

TripCheck An Oregon Department of Transportation website that displays real-time data regarding road conditions, weather conditions, camera images, delays due to congestion and construction, and other advisories. Additionally, TripCheck provides travelers with information about travel services such as food, lodging, attractions, public transportation options, scenic byways, weather forecasts, etc. This information is also available through the 511 travel information phone line.

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.

Value Pricing A demand management strategy that involves the application of market pricing (through variable tolls, variable priced lanes, area-wide charges or cordon charges) to the use of roadways at different times of day. Also called congestion pricing or peak period pricing.

Vision In this document, an aspirational statement of what the region is trying to achieve over the long-term through policy and investment decisions.

Vision Zero A system and approach to public policy developed by the Swedish government which stresses safe interaction between road, vehicle and users. Highlighted elements include a moral imperative to preserve life, and that the system conditions and vehicle be adapted to match the capabilities of the people that use them. Vision Zero employs the Safe System approach.

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.

Vulnerable Users In this document, refers to groups of people that are more vulnerable to being killed or severely injured in traffic crashes. Vulnerable users are people that are more vulnerable to being killed or seriously injured in crashes. Vulnerable users are pedestrians, bicyclists, motorcycle operators, children, older adults, road construction workers, people with disabilities, people of color and people with low income.

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