

2018 Regional Transportation Plan



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2018 Regional Transportation Plan Chapter 3 System Policies to Achieve Our Vision

December 6, 2018

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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.

Regional Transportation Plan website: [**oregonmetro.gov/rtp**](http://oregonmetro.gov/rtp)

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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.

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 and address key regional priorities identified during development of the plan – equity, safety, Climate Smart implementation and congestion. 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 chapter 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 as well as state and local partners.

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 leadership and 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.



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

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 shown on the regional motor vehicle network map, 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.
3. All high capacity transit and regional transit network facilities and their bridges shown on the regional transit network map.
4. All regional bicycle and pedestrian facilities and their bridges, including regional trails shown on the regional pedestrian and bicycle network maps.
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 shown on the regional freight network map.
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-

Regional Transportation System Components

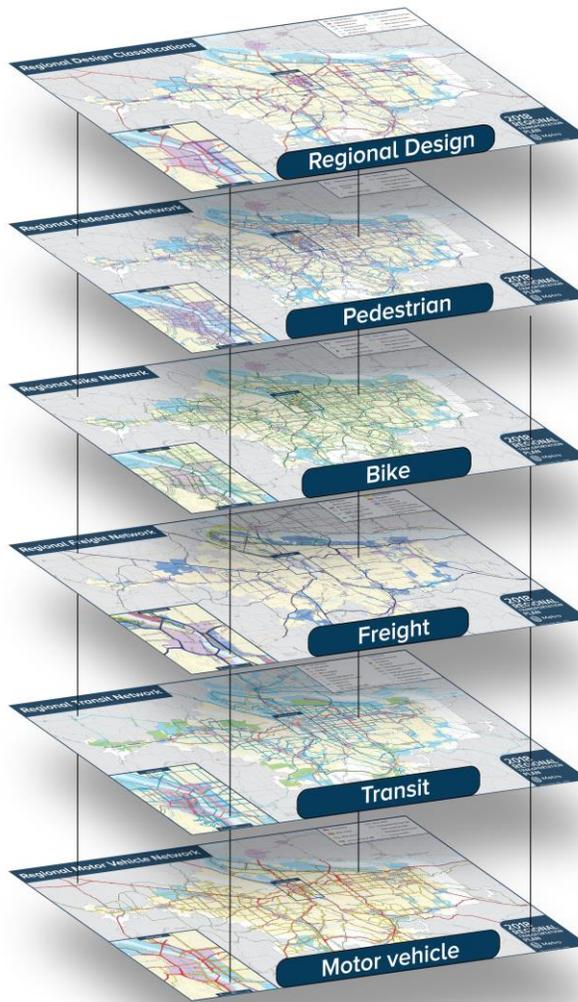
Regional multimodal transportation facilities and services include the following:

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

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.

Regional Transportation System Components



Click on [2018 RTP Regional Network Maps](#) for an online zoomable version of each map.

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.

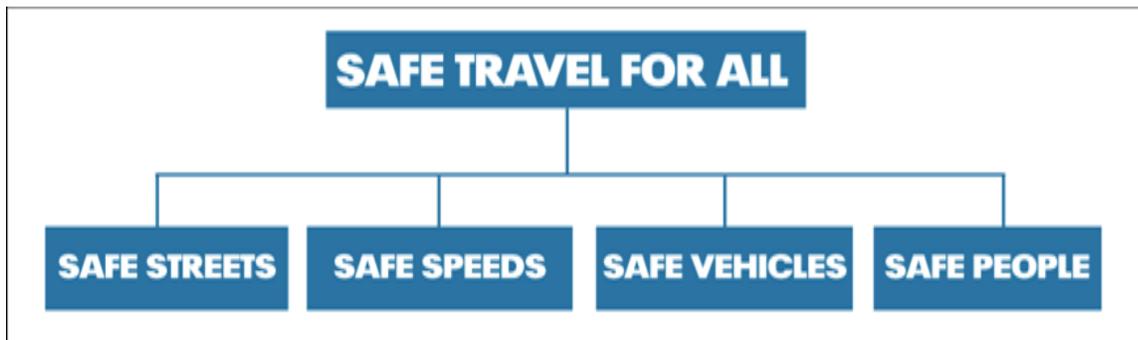
3.2.1.2 Using the Safe System approach

The Safety Strategy employs a Safe System approach with the goal of zero fatal and severe injury traffic deaths. The Safe System approach originated in Sweden and now other countries and many U.S. cities are using the framework. Similar frameworks are Vision Zero (Sweden), 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 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



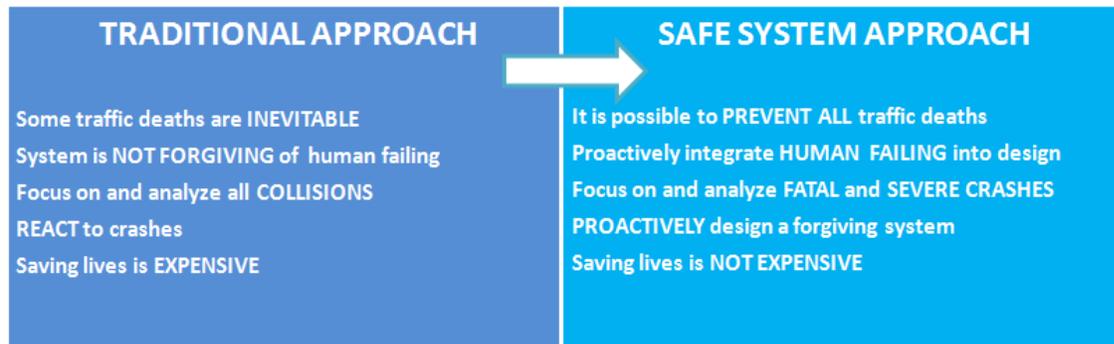
Source: Vision Zero Network

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



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.

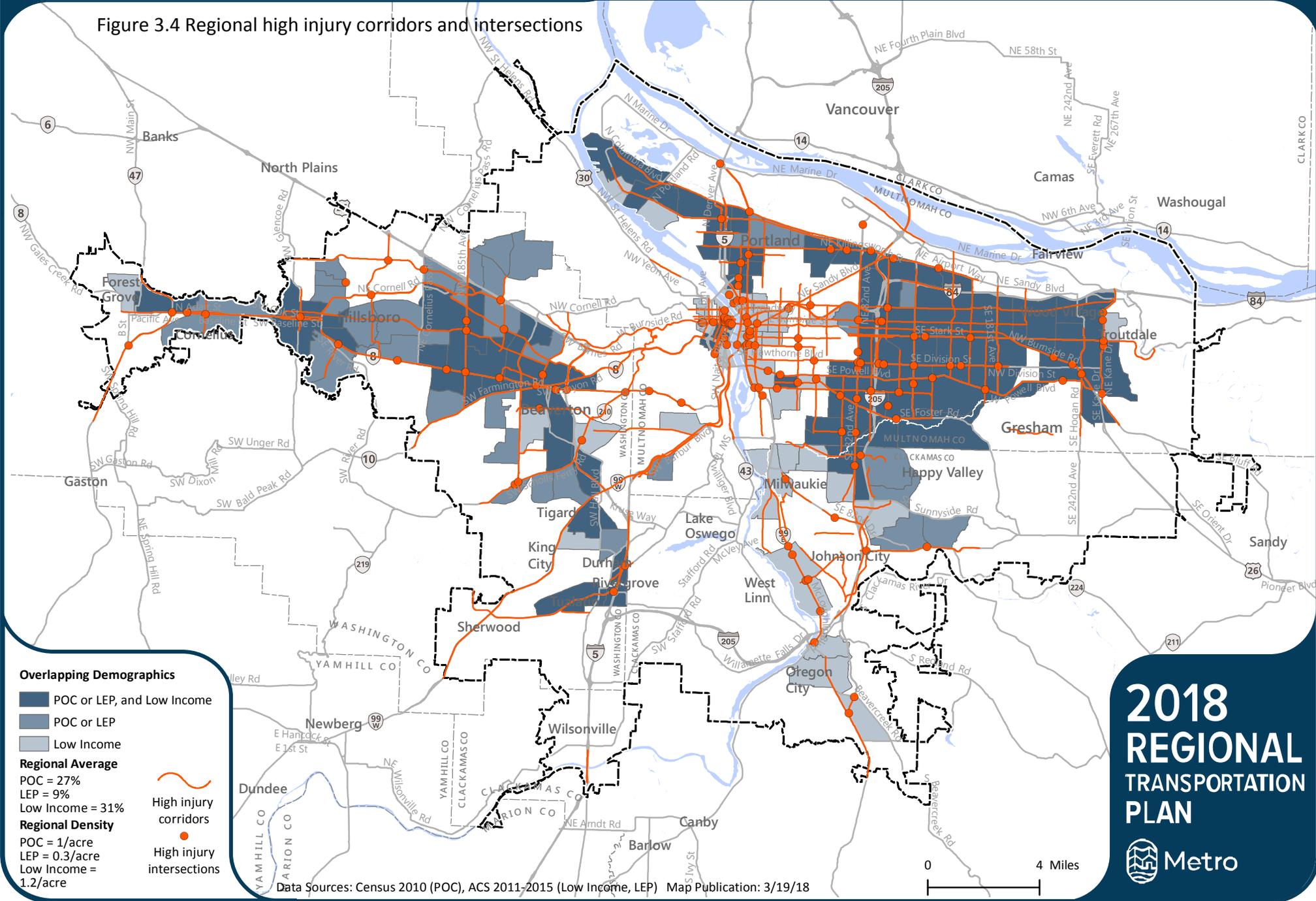
A majority of the high injury corridors and intersections – and a majority of pedestrian deaths and severe injuries – are in areas with higher concentrations of people of color, people with low incomes and English language learners. Implementing policies and actions to increase transportation safety 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.

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.

Figure 3.4 Regional high injury corridors and intersections



Data Sources: Census 2010 (POC), ACS 2011-2015 (Low Income, LEP) Map Publication: 3/19/18

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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** 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.
- 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 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.

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.

3.2.2 Transportation equity policies

Oregon has a long and unfortunate history 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 swath through Portland’s established African American neighborhoods, destroying at least 50 square blocks of homes and creating a barrier that still exists today.

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

Census tracts 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

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

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

The key aspect of the Strategic Plan is its focus and emphasis on deliberately tackling inequities based on race and ethnicity. The Strategic Plan is organized around five long-term goals.

The goals are:

- A. Metro convenes and supports regional partners to advance racial equity;
- B. Metro meaningfully engages communities of color;
- C. Metro hires, trains and promotes a racially diverse workforce;
- D. Metro creates safe and welcoming services, programs and destinations; and
- E. Metro's resource allocation advances racial equity.

Each goal area has specific objectives and implementation actions associated to each goal some of which are internally focused on Metro practices and some of which are externally focused on how Metro considers and serves the needs of communities of color and will require collaborative effort with partners.

The Strategic Plan builds on the extensive equity work that Metro departments and venues have been conducting for a number of years, including the 2014 Regional Transportation Plan. In developing the 2018 RTP, the region looked for opportunities to further align the goals areas of the Strategic Plan with the goals, objectives, policies, strategies and projects of the region's long-range transportation plan.

3.2.2.2 Transportation equity and the Regional Transportation Plan

In previously adopted RTPs, the focus on transportation equity was primarily limited to:

- looking at where marginalized groups are living in the Portland metropolitan region; and
- looking at how much investment was being made in these aggregated historically marginalized communities in comparison to other parts of the region.

Through the direction from Metro's *Strategic Plan to Advance Racial Equity, Diversity, and Inclusion*, as well as feedback and input provided by community leaders, advocates, and elected officials, and direction from the Metro Council, the role and consideration of equity has been expanded in the RTP. As a result, development of the 2018 RTP included a more extensive transportation equity system evaluation of the long-range financially constrained transportation investment strategy and conducted refinements and added new sections to the 2018 RTP goals, objectives, policies, and implementation actions.

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.



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.

3.2.2.3 Regional Transportation Plan 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)

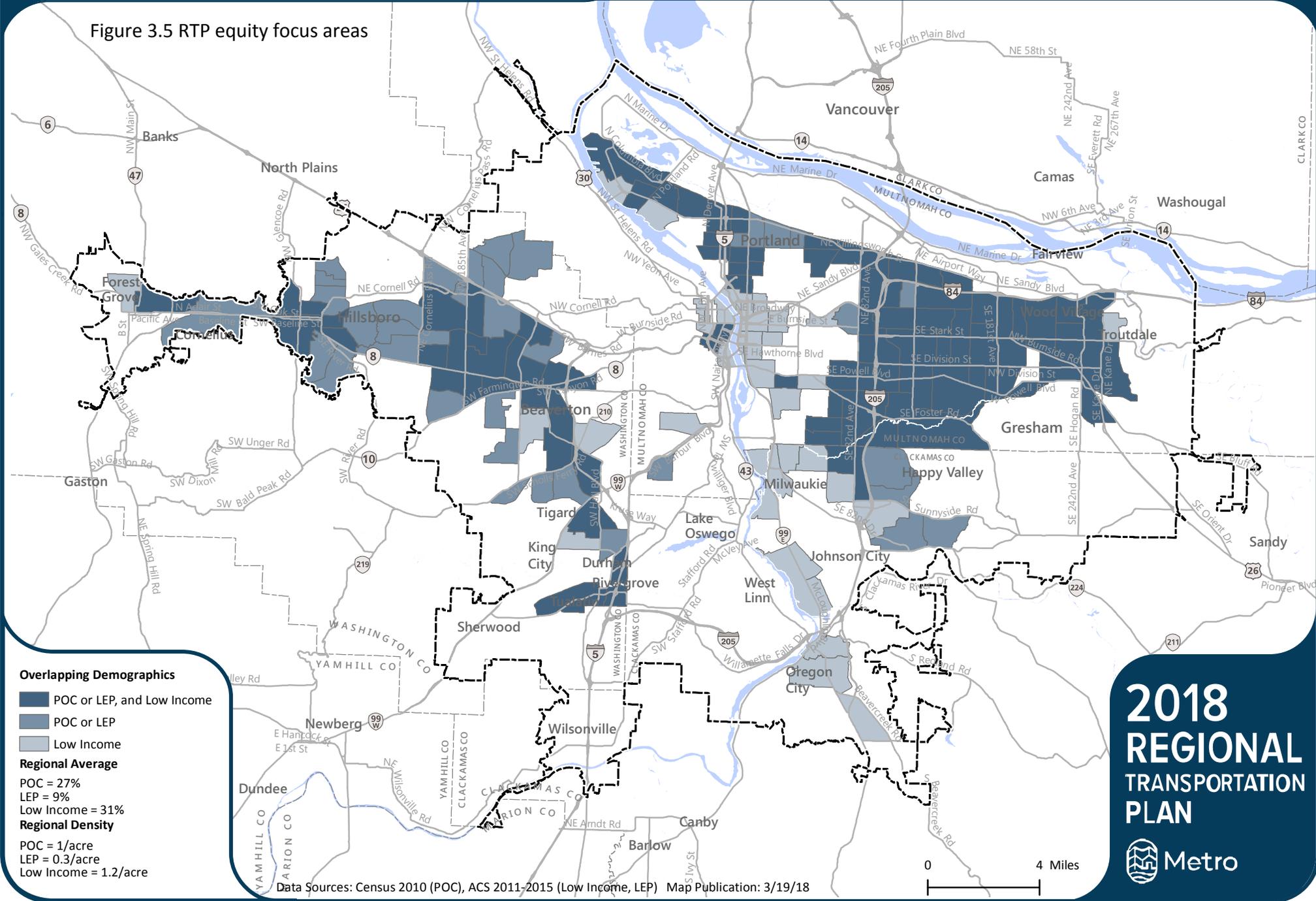
These three communities are the emphasis and focus for the Regional Transportation Plan, but not with exclusivity to the needs of other marginalized communities, including young people, older adults and people living with disabilities.

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.

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.

Figure 3.5 RTP equity focus areas



Overlapping Demographics

- POC or LEP, and Low Income
- POC or LEP
- Low Income

Regional Average

- POC = 27%
- LEP = 9%
- Low Income = 31%

Regional Density

- POC = 1/acre
- LEP = 0.3/acre
- Low Income = 1.2/acre

Data Sources: Census 2010 (POC), ACS 2011-2015 (Low Income, LEP) Map Publication: 3/19/18

0 4 Miles

**2018
REGIONAL
TRANSPORTATION
PLAN**

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 percent 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



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.

⁸ Statistics from PolicyLink and the Transportation Equity Caucus.

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 planned, 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 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 4.

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 that 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 options, jobs, and community places.¹

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.



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 a retrospective process of previous engagement efforts 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 continued 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 Routes 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 increase 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.
- Document existing disparities in exposure to transportation related air pollutants and evaluate whether projects reduce or exacerbate disparities.

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 communities in planning and decision-making processes.

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.



Appendix E documents the transportation equity evaluation conducted for the 2018 Regional Transportation Plan – focusing on priority outcomes identified by historically marginalized communities during the engagement process.

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.

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

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 and ground truth data and technical analysis findings.



Conventional practices of data collection and analysis does not capture and articulate the transportation-related disparities, barriers, needs and priorities of communities of color and other historically marginalized communities. Engagement and other methods should be used to supplement and ground truth data and technical analysis findings.

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.

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

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.

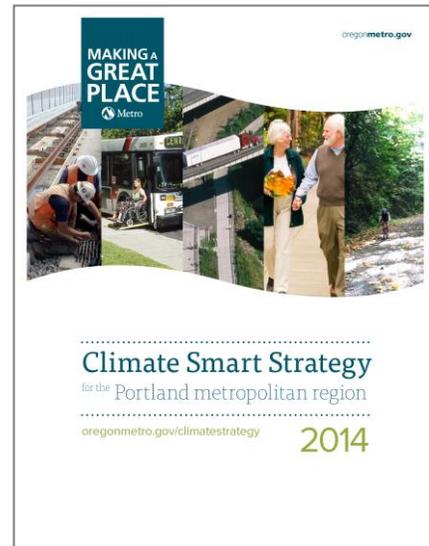
Warmer temperatures will affect the service life of transportation infrastructure, and the more severe storms that are predicted will increase the frequency of landslides and flooding. Consequent damage to roads and rail infrastructure will compromise system safety, disrupt mobility and hurt the region's economic competitiveness and quality of life. 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 equitable communities, and grow our economy – all while reducing greenhouse gas emissions.



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

The 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. The Land Conservation and Development Commission approved the region's strategy in May 2015.

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 leadership goal and objectives.

3.2.3.3 Climate Smart Strategy toolbox of potential actions

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 a comprehensive toolbox of more than 200 specific actions that can be taken by the state of Oregon,

Metro, cities, counties, transit providers and others to support implementation. These supporting actions are summarized in the *Toolbox of Possible Actions (2015-2020)* adopted as part of the Climate Smart Strategy. The actions support implementation of adopted local and regional plans and, if taken, will reduce greenhouse gas emissions and minimize the region's contribution to climate change in ways that support community and economic development goals. The Climate Smart Strategy's *Toolbox of Possible Actions* was developed with the recognition that existing city and county plans for creating great communities are the foundation for reaching the state target and that some tools and actions may work better in some locations than others. As such, the toolbox does not mandate adoption of any particular policy or action. Instead, it emphasizes the need for many diverse partners to work together to begin implementation of the strategy while retaining the flexibility and discretion to pursue the actions most appropriate to local needs and conditions.

Local, state and regional partners are encouraged to review the toolbox and identify actions they have already taken and any new actions they are willing to consider or commit to in the future. Updates to local comprehensive plans and development regulations, transit agency plans, port district plans and regional growth management and transportation plans present ongoing opportunities to consider implementing the actions recommended in locally tailored ways.

3.2.3.4 Climate Smart Strategy monitoring

The Climate Smart Strategy also contained performance measures and performance monitoring targets for tracking implementation and progress. The purpose of the performance measures and targets is to monitor and assess whether key elements or actions that make up the strategy are being implemented, and whether the strategy is achieving expected outcomes. If an assessment finds the region is deviating significantly from the Climate Smart Strategy performance monitoring targets, then Metro will work with local, regional and state partners to consider the revision or replacement of policies and actions to ensure the region remains on track with meeting adopted targets for reducing greenhouse gas emissions.

Appendix J reports on implementation progress since 2014, and found the 2018 Regional Transportation Plan makes satisfactory progress towards implementing the Climate Smart Strategy and, if fully funded and implemented, can reasonably be expected to meet the state-mandated targets for reducing per capita greenhouse gas emissions from passenger cars and small trucks (light-duty vehicles) for 2035 and 2040.

The analysis also found that more investment, actions and resources will be needed to ensure the region achieves the mandated greenhouse gas emissions reductions defined in OAR



Appendix J reports on implementation progress since 2014. The analysis found the 2018 RTP makes satisfactory progress towards implementing the Climate Smart Strategy, but more investment, actions and resources are needed to ensure the region achieves mandated greenhouse gas emissions reductions.

660-044-0060. In particular, additional funding and prioritization of Climate Smart Strategy investments and policies that substantially reduce greenhouse gas emissions will be needed.

3.2.3.5 Transportation preparedness and resilience

The topic of preparedness and resilience has broad implications across all sectors of the economy and communities throughout the region. Natural disaster can happen anytime, affecting multiple jurisdictions simultaneously. The region needs to be prepared to respond quickly, collaboratively and equitably, and the transportation system needs to be prepared to withstand these events and to provide needed transport for fuel, essential supplies and medical transport. Advance planning for post-disaster recovery is also critical to ensure that communities and the region recover and rebuild important physical structures, infrastructure and services, including transportation – it can make communities and the region stronger, healthier, safer and more equitable.

What are the risks we face?

Climate change, natural disasters, such as earthquakes, urban wildfires and hazardous incidents, and extreme weather events present significant and growing risks to the safety, reliability, effectiveness and sustainability of the region’s transportation infrastructure and services. Flooding, extreme heat, wildfires and severe storm events endanger the long-term investments that federal, state, and local governments have made in transportation infrastructure. Changes in climate have intensified the magnitude, duration and frequency of these events for many regions in the United States, a trend that is projected to continue. There is much work going on locally, regionally, statewide and across the country to address these risks.

Regional collaboration and disaster preparedness

The Regional Disaster Preparedness Organization (RDPO) is a partnership of government agencies, non-governmental organizations, and private-sector stakeholders in the Portland metropolitan area collaborating to increase the region’s resilience to disasters. RDPO’s efforts span across Clackamas, Columbia, Multnomah, and Washington counties in Oregon and Clark County in Washington.

According to the 2013 Oregon Resilience Plan, Oregon’s buildings and lifelines (transportation, energy, telecommunications, and water/ wastewater systems) would be damaged so severely that it would take three months to a year to restore full service in areas such as the Portland region. More recently, a 2018 report from the Oregon Department of Geology and Mineral Industries (DOGAMI) on the Portland region describes significant casualties, economic losses and disruption in the event of a large magnitude Cascadia subduction zone earthquake.



The Regional Disaster Preparedness Organization (RDPO) is a partnership of government agencies, non-governmental organizations, and private-sector stakeholders in the Portland metropolitan area collaborating to increase the region’s resilience to disasters. For more information, visit www.rdpo.net.



While transportation infrastructure is designed to handle a broad range of impacts based on historic climate patterns, more planning and preparation for climate change, earthquakes and other natural disasters and extreme weather events is critical to protecting the integrity of the transportation system and improving resilience for future hazards.

Potential opportunities for future regional collaboration in support of transportation preparedness and resilience include:

- Partner with the RDPO to update the region’s designated Emergency Transportation Routes (ETRs) for the five-county area, which were last updated in 2006. These routes are designated to facilitate all-hazards emergency response activities, including those of medical, fire, law enforcement and disaster debris removal in the immediate aftermath of an earthquake or other major event. The project will use data from the DOGAMI study to apply a seismic lens to determine 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. Some considerations for emergency recovery will also be incorporated into the updated ETR criteria and recommendations for future work. See Chapter 8 (Section 8.2.3.10) for more information.
- Consider climate and other natural hazard-related risks during transportation planning, project development, design and management processes.
- Conduct a vulnerability assessment for the region, documenting climate and other natural hazard-related risks to the region’s transportation system and vulnerable populations, and potential investments, strategies and actions that the region can implement to reduce the vulnerability of the existing transportation system and proactively increase the transportation system’s resiliency.

- Optimize operations and maintenance practices that can help lessen impacts on transportation from extreme weather events and natural disasters. Examples include more frequent cleaning of storm drains, improved plans for weather emergencies, closures and rerouting, traveler information systems, debris removal, early warning systems, damage repairs and performance monitoring.
- Integrate green infrastructure into the transportation network when practicable to avoid, minimize and mitigate negative environmental impacts of climate change, natural disasters and extreme weather events.
- Protection and avoidance of natural areas and high value natural resource sites, especially the urban tree canopy and other green infrastructure, in slowing growth in carbon emissions from paved streets, parking lots and carbon sequestration and addressing the impacts of climate change and extreme weather events, such as urban heat island effects and increased flooding.
- Avoidance of transportation-related development in hazard areas such as steep slopes and floodplains that provide landscape resiliency and which are also likely to increase in hazard potential as the impacts of climate change increase.

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 18,000 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 3.1**.

Table 3.1 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.	Technology 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 and accountability	Collecting transportation data becomes more efficient.	Private companies withhold data from public agencies and resist oversight.

Source: Emerging Technology Strategy, Metro (2018)

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.

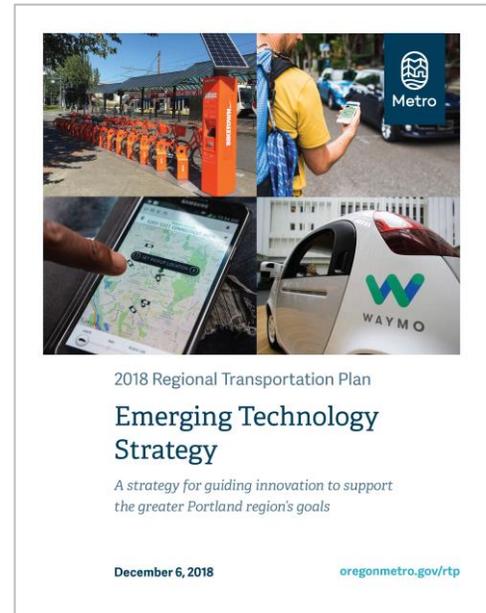
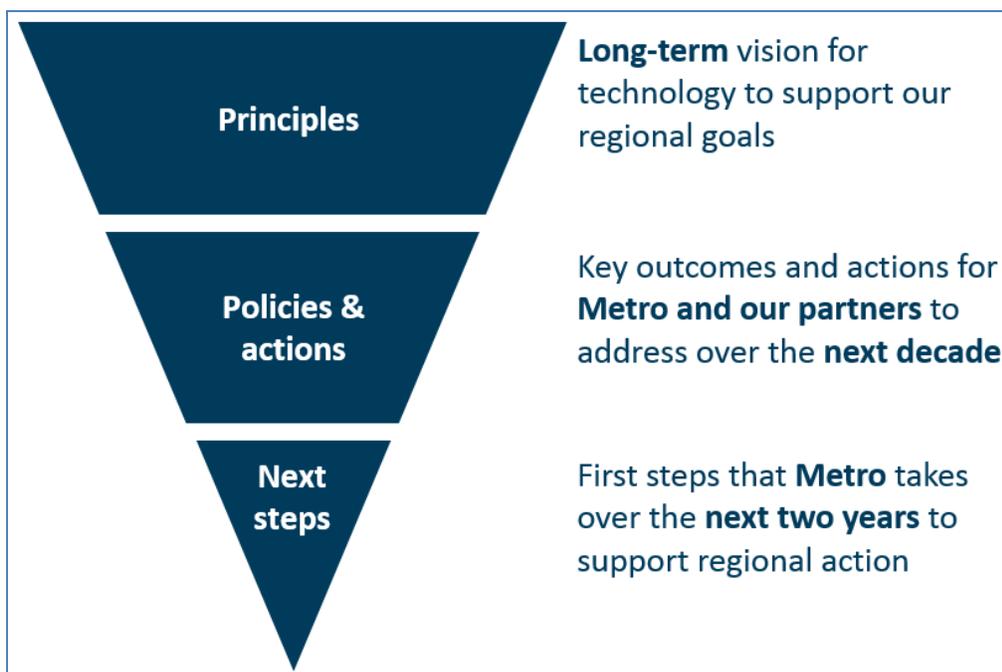


Figure 3.6 Emerging Technology Strategy policy framework



Source: Emerging Technology Strategy, Metro (2018)

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 3.2**, 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 3.2 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 and accountability	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 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 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 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
- Flex zone 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 3.3** Regional Design Classifications for an illustration of the concepts associated with each design classification and **Figure 3.7** 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.

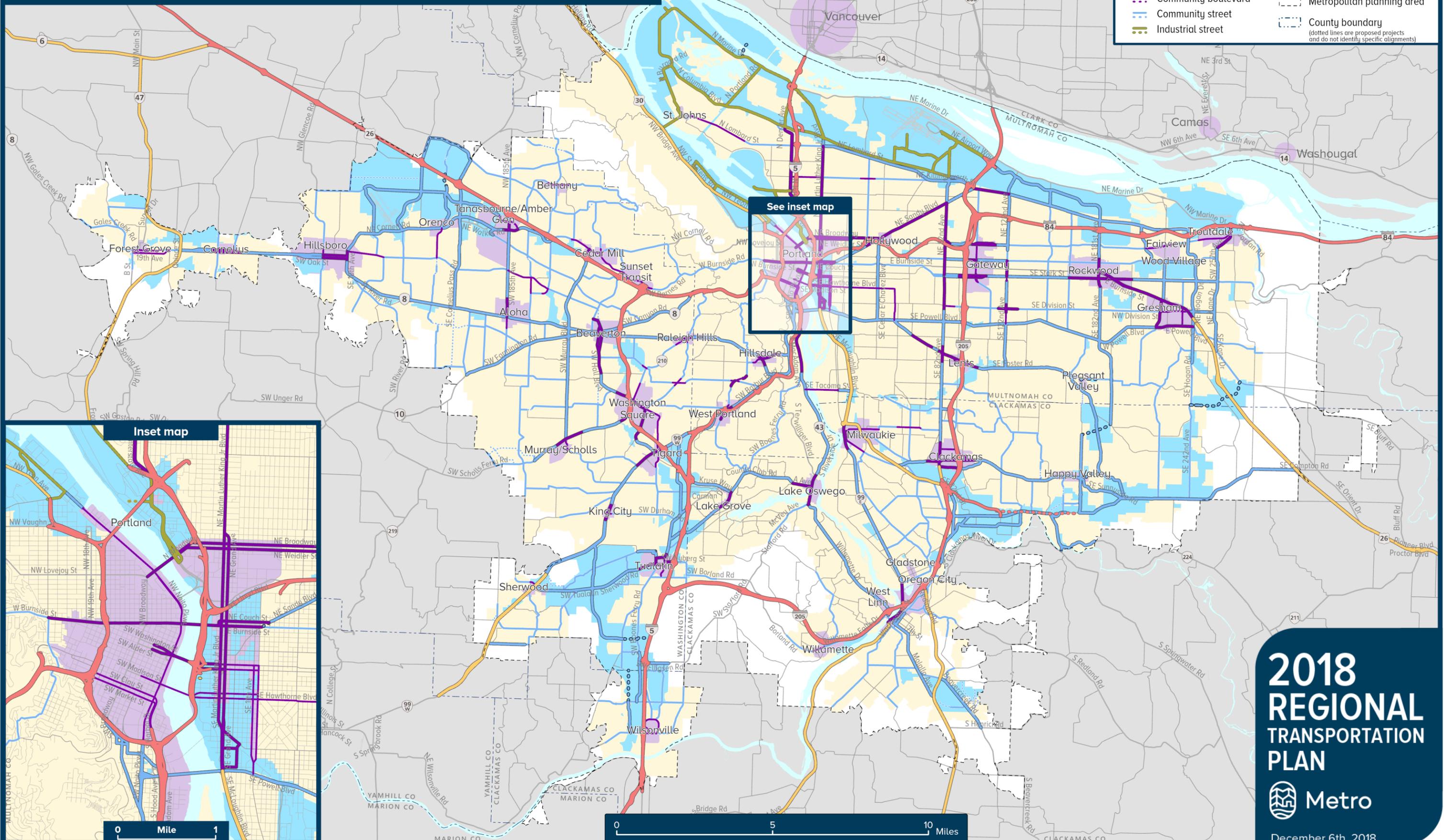
- **Freeways and Highways Design Classification:** The Freeways and Highways design classifications are applied to completely grade-separated limited-access facilities and primarily limited-access facilities with some at-grade intersections. This design classification is assigned to facilities with the 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. Desirable green infrastructure designs to protect and enhance the natural environment, such as filter and retain stormwater, minimize light pollution and allow wildlife crossings and fish passage.

- Regional and Community Boulevards Design Classification:** The Boulevard design classification is applied to the segments of major and minor arterials in areas identified with the 2040 land use types of central city, center, station community or main street. 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. Include green infrastructure designs to protect and enhance the natural environment, such as filter and retain stormwater, minimize light pollution and allow wildlife crossings and fish passage.
- 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, including those identified on the 2040 land use type map as corridors. 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. Include green infrastructure designs to protect and enhance the natural environment, such as filter and retain stormwater, minimize light pollution and allow wildlife crossings and fish passage.
- 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. Include green infrastructure designs to protect and enhance the natural environment, such as filter and retain stormwater, minimize light pollution and allow wildlife crossings and fish passage.

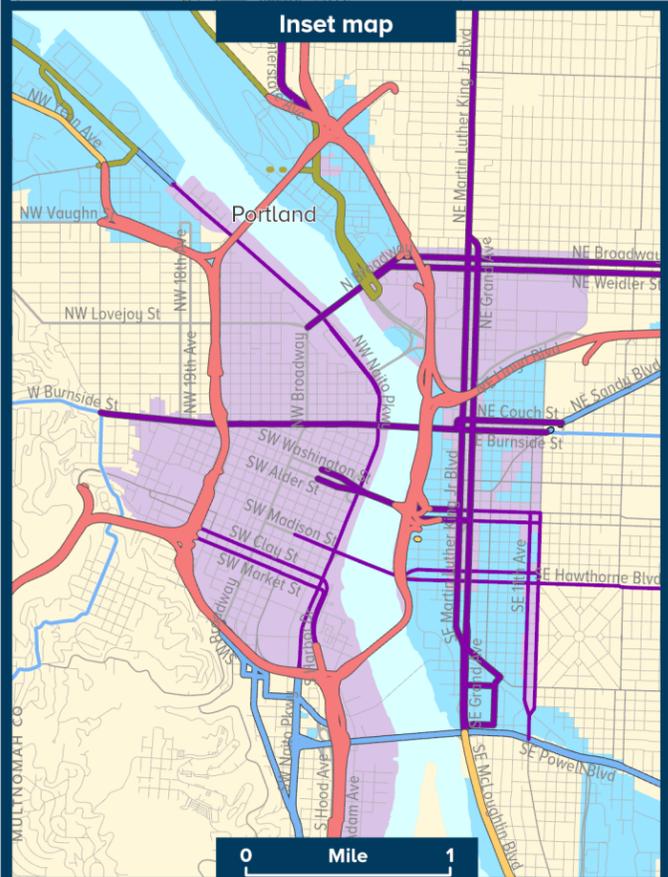
Regional Design Classifications

Figure 3.7 Regional design classifications

-  Freeway
-  Highway
-  Regional boulevard
-  Regional street
-  Community boulevard
-  Community street
-  Industrial street
-  Urban center
-  Employment/Industrial area
-  Urban growth boundary
-  Metropolitan planning area
-  County boundary
(dotted lines are proposed projects and do not identify specific alignments)



See inset map



2018
REGIONAL
TRANSPORTATION
PLAN



December 6th, 2018

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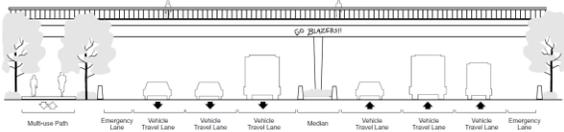
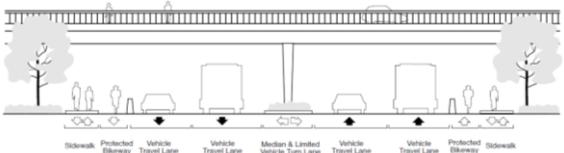
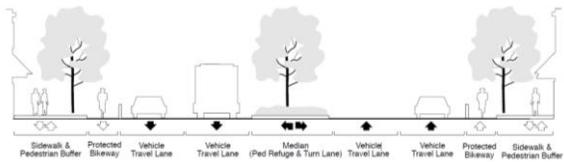
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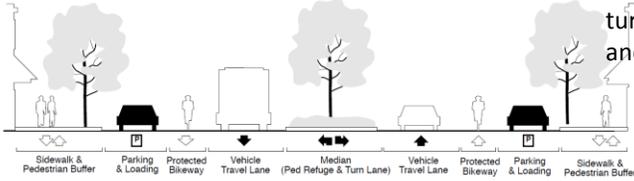
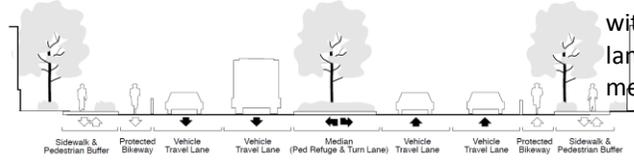
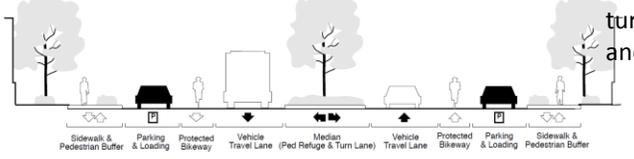
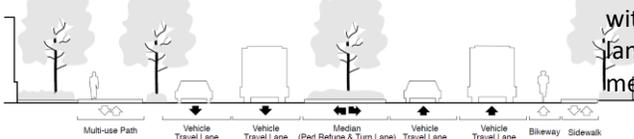
The design concepts promote community livability and reliable travel by balancing all modes of travel and addressing the function and character of adjacent land uses. Linking land use and the physical design of transportation facilities is crucial to achieving state goals to limit reliance on any one mode of travel and to encourage increased walking, bicycling, carpooling, vanpooling and use of transit.

Table 3.3 summarizes design classifications, typical design elements and motor vehicle functions, illustrating how multimodal design elements can be integrated.

Table 3.3 Design classifications for the 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

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.

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

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 3.4** identifies the design characteristics of arterials that can promote or hinder health.

Table 3.4 Design characteristics of healthy arterials¹⁰

Health Promoting Design	Unhealthy Design
Neighborhood asset for access and commerce	Physical barrier that divides neighborhoods
Supports neighborhood social and 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

Metro’s Designing Livable Streets and Trails 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 *Understanding and Improving Arterial Roads to Support Public Health and Transportation Goals*, American Journal of Public Health, August 2017.

Figure 3.8 Metro’s Designing Livable Streets handbooks



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
- Green infrastructure (see next section)



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.

Street designs that separate people walking and biking from motor vehicle traffic also help reduce exposure to and mitigate the impacts of traffic pollution, particularly in heavily traveled corridors and along streets with multi-family housing. Local jurisdictions are encouraged to consider prioritizing electrification of transit and charging infrastructure for passenger vehicles and freight as well as best practices in orienting buildings and designing indoor air systems to minimize pollution exposure.

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 and habitat connectivity, is well documented. Transportation infrastructure has the potential to degrade water quality, create barriers to corridors for animal travel and increase air, noise and light pollution. Projects also have the potential to negatively impact cultural and historical resources if not planned and implemented carefully.

Projects should be designed to avoid or minimize impact, or if avoidance is not possible, to maximize enhancement, protection and improvement of natural, community and cultural resources.

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.



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

Existing natural resources inventory data can be used to improve and refine project prioritization and design to improve habitat connectivity, remedy barriers from existing and proposed transportation infrastructure and restore ecological processes.

Impervious surfaces have been linked to flooding and changes in hydrology, the shape of streams, water quality, water temperature and the biological health of waterways. With respect to runoff quality, recent research by the National Marine Fisheries Service and Washington State University points to the high aquatic toxicity of runoff from roadway surfaces. This toxicity is directly proportional to traffic volumes. Stormwater facilities that are vegetated and contain compost-amended soils represent the only currently effective treatment options to address these often unidentified toxic compounds. Such facilities are also required to be prioritized in current National Pollutant Discharge Elimination System (NPDES) municipal stormwater permits across the region.

With respect to runoff quantity, development in the region at increasing density results in less pervious surface available to absorb the combined runoff volumes from transportation surfaces, structures and associated impervious area. Runoff volumes of winter peak flows can more than double from predeveloped conditions in the face of urban development, with associated flow reductions in summer. Climate change is expected to reinforce this pattern. Higher runoff volumes result in channel erosion, aquatic and floodplain habitat degradation, and damage to infrastructure (including transportation infrastructure such as bridges and culverts). Low summer flows reduce the vigor of vegetation that helps stabilize streambanks. Yet more than half of the region, including nearly all of the area west of the Willamette River, has subsurface conditions that do not promote easy infiltration of large volumes of urban runoff.

Regional Green Streets guidelines seek to minimize and mitigate these effects through a combination of retrofits to existing streets and designs for new streets and throughways. This is how the RTP and Metro's Designing Livable Streets and Trails handbooks help ensure protection of salmon and steelhead that were federally 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. When a new structure is built (or an existing one modified) that could damage important wildlife habitat or impede wildlife movement, crossings of all types should be designed appropriately to allow for fish, wildlife, and sometimes people movement at all water levels.

Table 3.5 Examples of how green infrastructure can help achieve RTP goals

RTP Goal	Examples of how green Infrastructure can help achieve RTP goals
Vibrant Communities	Green infrastructure, including trails, parks, street trees, vegetation, and bioswales, contribute to community beautification and public health by connecting people with nature in their daily lives.
Shared Prosperity	Green infrastructure can promote economic growth as a valued public amenity, create construction and maintenance jobs, add to property value, support walkable and bikeable communities, businesses and commercial districts, and lower the costs associated with climate change.
Transportation Choices	Green streets can promote active travel and access to transit by providing enjoyable routes that are shaded and buffered from traffic.
Reliability and Efficiency	Green infrastructure treatments, such as access management and medians with bioswales, can be designed to support reliability and efficiency by reducing crashes and conflicting movements.
Safety and security	Street trees and other green infrastructure can help calm traffic to desired speeds, provide welcoming places that increase security, and improve resiliency and reduce impacts of major storm events.
Healthy Environment	Green infrastructure can enhance and protect the natural environment by supporting clean air and water, filtering stormwater runoff, reducing erosion, protecting, creating and connecting habitat for birds, fish and other wildlife.
Healthy People	Green infrastructure can reduce water, air, noise and light pollution, encourage active lifestyles and link people to trails, parks and nature that enhance human health and well-being.
Climate Leadership	Trees and green infrastructure can support climate adaptation by cooling streets, parking lots and buildings, better managing stormwater and reducing the urban heat island effect. Trees and vegetation can be managed to sequester greenhouse gases to help mitigate climate change.
Equitable Transportation	Clean air and water and access to nature can be improved and habitat can be preserved and enhanced when green infrastructure is provided in historically marginalized communities.
Fiscal stewardship	Protecting the environment and natural resources today can save money for the future and reduce infrastructure construction and maintenance costs.
Transparency and Accountability	All stakeholders can be represented, including those that cannot speak for themselves – wildlife and the natural environment. Performance-based planning includes considering environmental effects throughout the planning process.

Infrastructure planning and design should first seek to avoid fish and wildlife habitat conservation areas. If that is not practicable, opportunities to minimize or mitigate the effects of transportation infrastructure and services through the application of “green” design treatments should be identified and implemented. Refer to **Appendix F** for examples of mitigation strategies for different environmental resource areas. For example, street trees, vegetated swales and other green street treatments can intercept rainwater and convey stormwater in the public right-of-way, following best practices to minimize light pollution, installing appropriate wildlife crossings, screening sensitive habitats from noise and light, enhancing vegetation associated with wetlands and waterways for wildlife, limiting fill within wetlands, constructing bridges or open bottom culverts, creating new wetland areas, and restoring or rehabilitating damaged wetlands and

waterways, using pervious materials and preserving, maintaining or enhancing tree canopy. 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.

Identification of potential transportation impacts during project development is done using Title 3 and Title 13 resource inventory data as a baseline, with acknowledgement that these inventories may be complemented with other publicly-adopted inventories, and additional data such as the Regional Conservation Strategy high value habitat areas or more recent federal or state resource inventories

The following list identifies the types of resource areas considered during development of RTP update to identify potential resource impacts:

- High value fish and wildlife habitat areas and biodiversity corridors
- Threatened and endangered species, including vertebrate species and plants
- Vegetation and wildlife
- Fisheries
- Wetlands and waterways
- Flood hazard areas/floodplains
- Historic resources
- Tribal lands and legacies
- Air quality and greenhouse gas emissions

The “avoid, minimize or mitigate approach” is known as “sequencing” and involves understanding the affected environment and assessing transportation effects throughout the project development process. The sequencing for projects follow this order:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action or project.
- Compensating for the impact by replacing or providing substitute resources or environments.

Refer to **Appendix F** as a source for more information on potential mitigation strategies specific to resource areas.



Appendix F documents the data and methods used to identify potential RTP project impacts on different resource areas and discusses examples of potential mitigation strategies to “avoid, minimize or mitigate” potential impacts.

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.

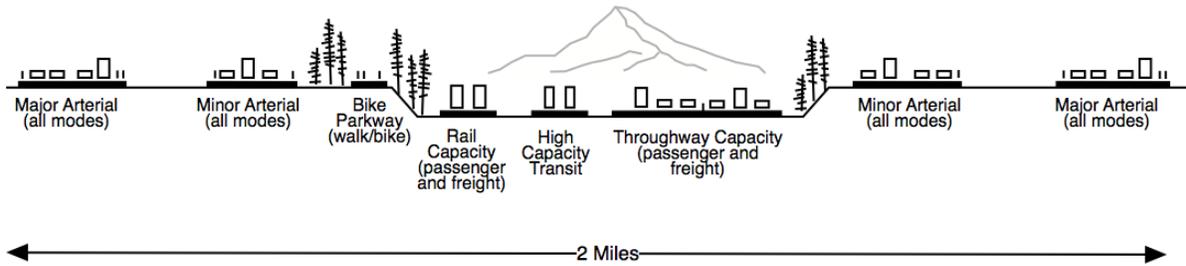
3.4.1 Regional mobility corridor concept

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 3.9**.

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.

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. Updates to these strategies will be informed by the Regional Mobility Policy update described in Chapter 8.

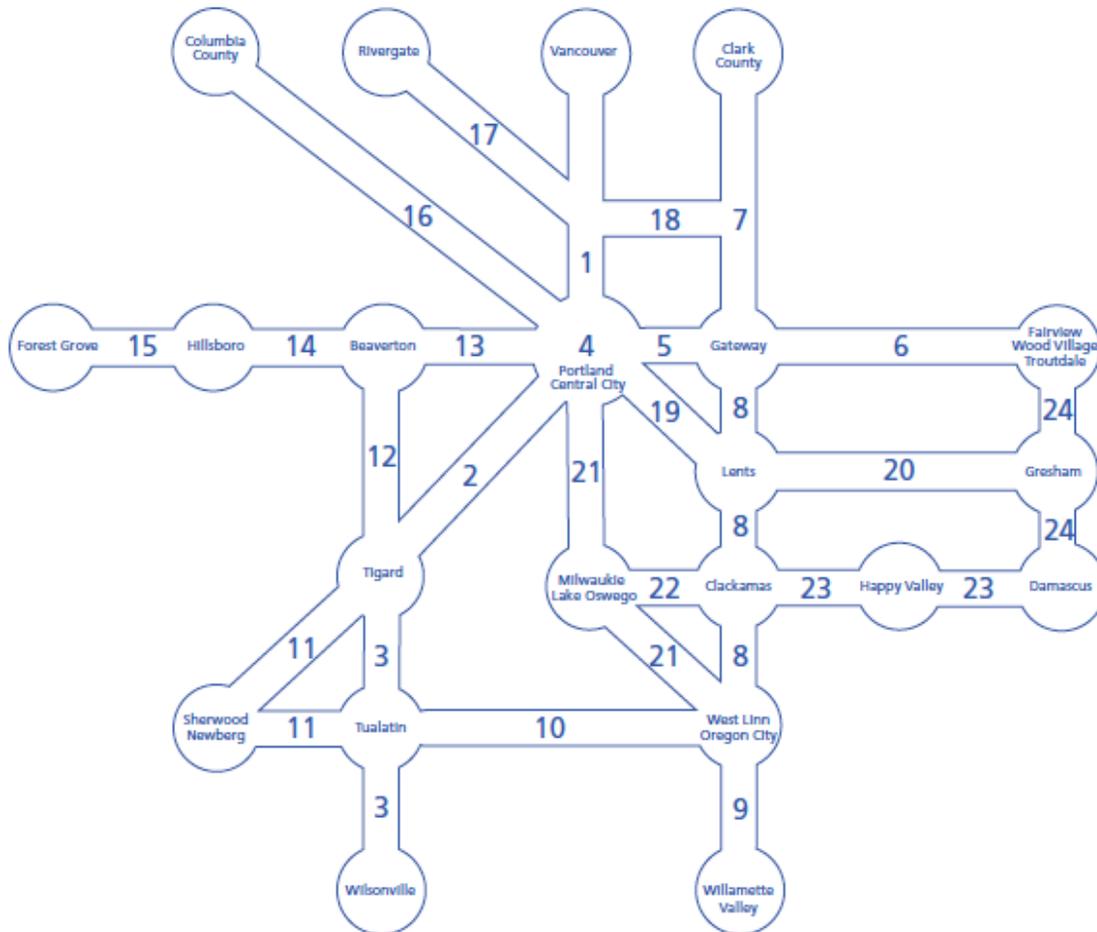
Figure 3.9 Regional mobility corridor concept



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 3.10 shows the general location of mobility corridors in the region.

Figure 3.10 Mobility corridors in the Portland metropolitan region



3.5 REGIONAL MOTOR VEHICLE NETWORK VISION AND POLICIES

3.5.1 Regional motor vehicle network vision

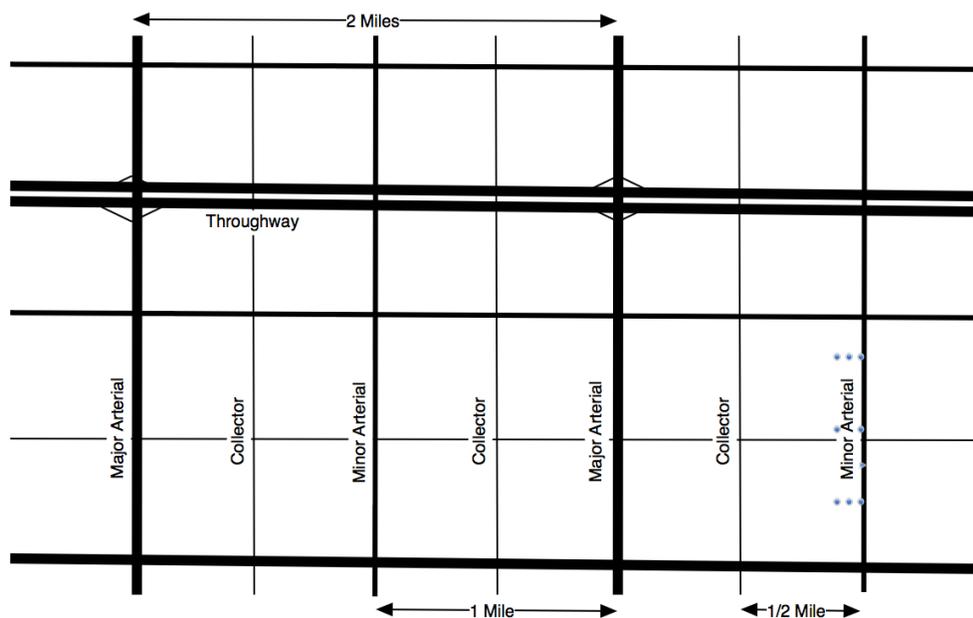
Though our region has changed dramatically over the past century, the shape of the major road network serving our region has not. Most of our regional streets were once farm-to-market roads, established along Donation Land Claim boundaries at half-mile or mile spacing. The region's throughway system 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.

3.5.2 Regional motor vehicle network concept

The Regional Motor Vehicle Network Concept shown in **Figure 3.11** illustrates policies for developing a complete and well-connected motor vehicle network that is safe and reliable, provides adequate capacity and supports all modes of travel.

Figure 3.11 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 regional motor vehicle concept and policies call 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.



The RTP calls for implementing system and demand management strategies and other strategies prior to building new motor vehicle capacity, consistent with the Federal Congestion Management Process (CMP), Oregon Transportation Plan policies (including Oregon Highway Plan Policy 1G) and Section 3.08.220 of the Regional Transportation Functional Plan (RTFP).

Regional motor vehicle network 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** Actively manage and optimize 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 congestion 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 new or improved facilities using Green Street infrastructure design, street trees, wildlife habitat or waterway crossing improvements and other approaches to the extent practicable.
- 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 designs for safe and convenient pedestrian and bicycle access for regional and local roadways.
- Policy 12** Prior to adding new throughway capacity beyond the planned system of through lanes, demonstrate that system and demand management strategies, including access management, transit and freight priority and congestion pricing, transit service and multimodal connectivity improvements cannot adequately address throughway deficiencies and bottlenecks.

***Note for Policy 7:** 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.

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

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.



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.

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 3.12**, the illustrative arterial street network is complemented by a well-connected network of collector streets. This network of arterial and collector 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 greater Portland 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 8 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 freight 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 functional classification generally corresponds to the Expressways functional classification in the Oregon Highway Plan. There are two types of Throughway designs as described in **Table 3.3**: Freeways - which are limited-access and completely grade separated and Highways, 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.



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

Streets designated with an arterial functional classification are shown in **Figure 3.13** and include Boulevard and Streets described in **Table 3.3** and shown in **Figure 3.7**.

Arterial safety

Safety is a primary concern on the regional arterial system, on which approximately 60 percent 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.

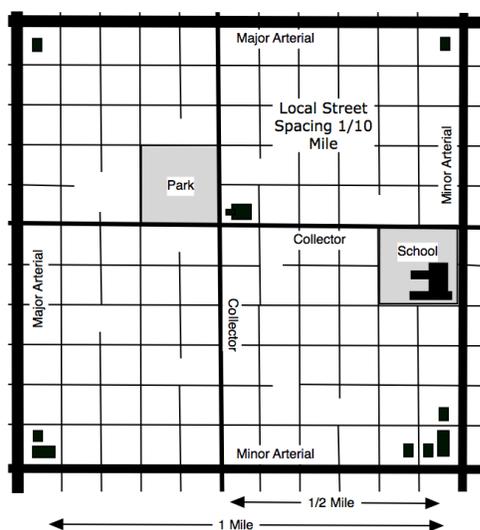
Collector and local street connectivity

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 3.4** (or when they are part of the Regional Bicycle Network or Regional 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 one-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 3.12 Collector and local street network concept



Note: Idealized concept for illustrative purposes showing desired spacing for collectors and local streets 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 3.12**, 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 between 200-2,000 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 Regional motor vehicle network classifications and map

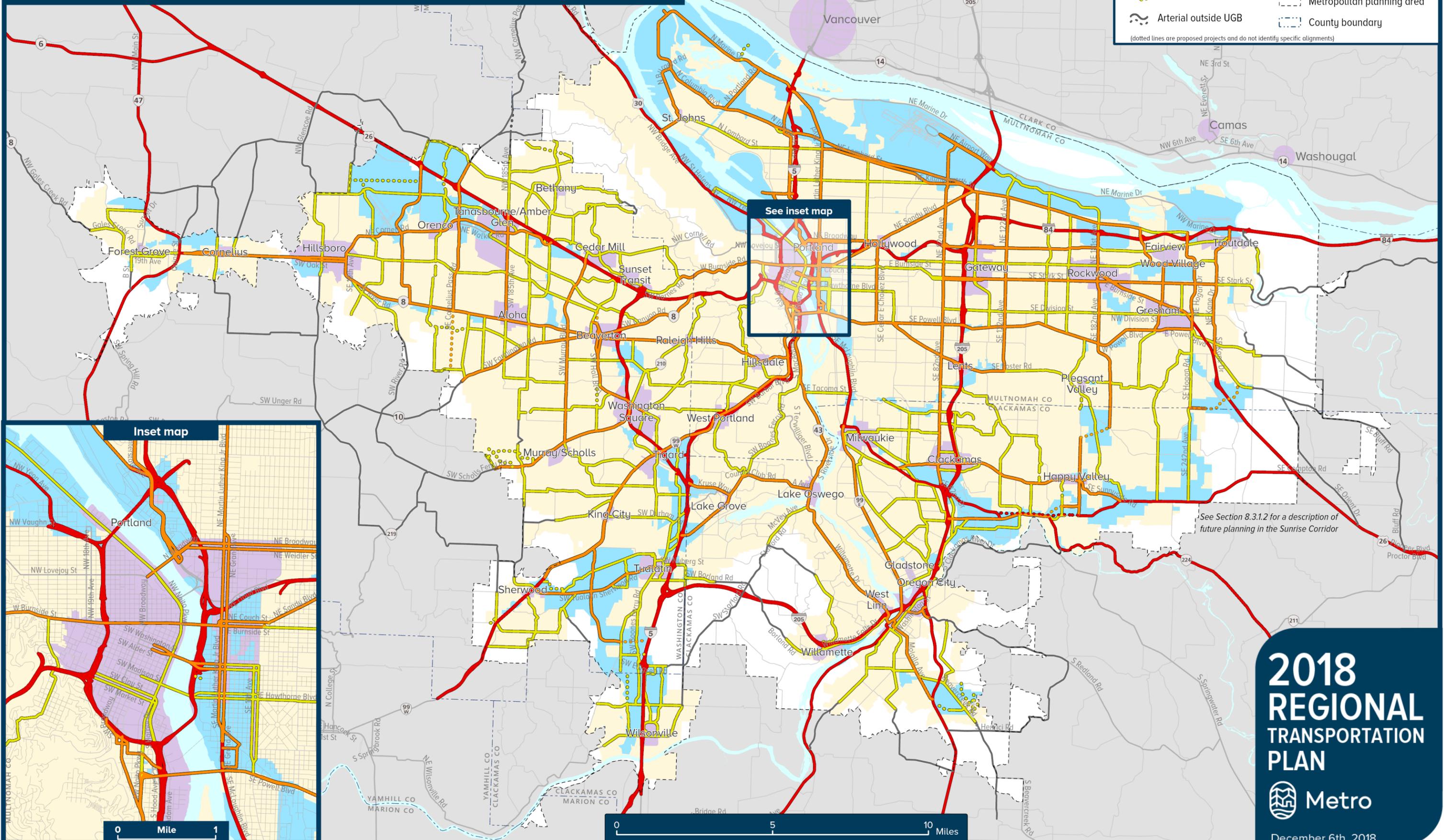
The Regional Regional Motor Vehicle Network is shown in **Figure 3.13**. Click on [2018 RTP Regional Network Maps](#) for online zoomable version of map.

Regional Motor Vehicle Network

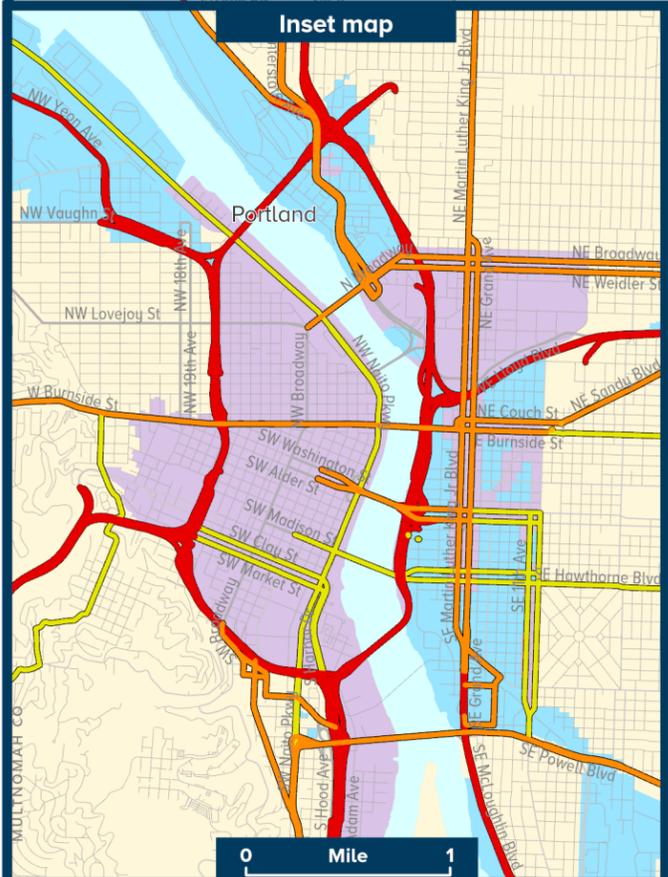
Figure 3.13 Regional motor vehicle network

	Throughway		Urban center
	Major arterial		Employment/Industrial area
	Minor arterial		Urban growth boundary
	Arterial outside UGB		Metropolitan planning area
			County boundary

(dotted lines are proposed projects and do not identify specific alignments)



See inset map



See Section 8.3.1.2 for a description of future planning in the Sunrise Corridor

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PLAN



December 6th, 2018

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3.5.4 Interim regional mobility policy

First adopted in 2000 and amended into the Oregon Highway Plan in 2002, the interim regional mobility policy reflects a level of motor vehicle performance in the region that JPACT, the Metro Council and the Oregon Transportation Commission (OTC) deemed acceptable at the time of its adoption. Policymakers recognized the policy as an incremental step toward using a more comprehensive set of measures that consider system performance for all modes, as well as financial, environmental and community impacts. This RTP continues that evolution and has defined a broader set of performance measures that can provide a more comprehensive assessment of transportation system performance as reflected in the performance measures and targets defined in Chapter 2.

The interim regional mobility policy in **Table 3.6** shows the minimum motor vehicle performance desired for transportation facilities designated on the Regional Motor Vehicle Network in **Figure 3.13**. Specifically, Table 3.6 reflects volume-to-capacity targets adopted in the RTP for facilities designated on the Regional Motor Vehicle Network as well as volume-to-capacity targets adopted in the Oregon Highway Plan for state-owned facilities in the urban growth boundary. In effect, the policy is used to evaluate current and future performance of the motor vehicle network, using the ratio of traffic volume (or forecasted demand) to planned capacity of a given roadway, referred to as the volume-to-capacity ratio (v/c ratio) or level-of-service (LOS).

Traditionally, motor vehicle LOS has been used in transportation system planning, project development and design as well as in operational analyses and traffic analysis conducted during the development review process. As a system plan, the RTP uses the interim regional policy to diagnose the extent of motor vehicle congestion on throughways and arterials during different times of the day and to determine adequacy in meeting the region's needs. LOS is also used to determine consistency of the RTP with the Oregon Highway Plan for state-owned facilities.



Regional Mobility Policy Update

There has been increasing discussion of the role of motor vehicle LOS as a performance metric. The region and local communities across the region have adopted goals such as improving safety for all roadway users (e.g., pedestrians, bicyclists, freight and transit users) and encouraging infill development to implement the 2040 Growth Concept, which often conflict with meeting LOS thresholds.

The region has committed to updating the interim regional mobility policy to better align with the comprehensive set of goals and desired outcomes identified in the RTP. Chapter 8 (Section 8.2.3.1) describes a proposed work plan for considering measures aimed at system efficiency, including people-moving capacity, person throughput and system completeness.

Table 3.6 Interim regional mobility policy

Deficiency thresholds for peak hour operating conditions expressed as volume to capacity ratio targets as adopted in the RTP and Oregon Highway Plan.

Locations	Target	Target	
	Mid-day One-Hour Peak ^{A, B}	PM Two-Hour Peak ^{A, B}	
		1 st hour	2 nd hour
Central City Regional Centers Town Centers Main Streets Station Communities	.99	1.1	.99
Corridors Industrial Areas Intermodal Facilities Employment Areas 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 ^C (from I-5 South to I-5 North)	.99	1.1	.99
Other state-owned routes ^D I-205 ^C I-84 (east of I-205) I-5 (Marquam Bridge to Wilsonville) ^C OR 217 US 26 (west of Sylvan) US 30 OR 8 (Murray Boulevard to Brookwood Avenue) ^{C, D} OR 47 OR 99W OR 212 ^E OR 224 OR 213 ^F	.90	.99	.99

Table Notes:

- A. Unless the Oregon Transportation Commission has adopted an alternative mobility target for the impacted state-owned facility within the urban growth boundary, the mobility targets in this table (and Table 7 of the Oregon Highway Plan) are considered standards for state-owned facilities for purposes of determining compliance with OAR 660-012-0060.
- B. The volume-to-capacity ratios in this table (and Table 7 of the Oregon Highway Plan) are for the highest two consecutive hours of weekday traffic volumes. The 2nd hour is defined as the single 60-minute period, either before or after the peak 60-minute period, whichever is highest. See Oregon Highway Plan Action 1.F.1 for additional technical details for state-owned facilities. The mid-day peak hour is the highest 60-minute period between the hours of 9 a.m. and 3 p.m.
- C. A corridor refinement plan, which will likely include a tailored mobility policy, is required by the Regional Transportation Plan for this corridor.

- D. Two facilities are not designated as principal arterial throughway routes in the RTP, including OR 8 between Murray Boulevard and Brookwood Avenue and portions of 99W, which are proposed to be removed from Table 7 of the Oregon Highway Plan in the next scheduled update.
- E. OR 212 is designated as a throughway route in the RTP and is proposed to be amended into Table 7 of the Oregon Highway Plan in the next scheduled update.
- F. In October 2018, the OTC approved an alternative mobility target that applies to the intersection of OR 213 and Beaver Creek Road such that during the first, second and third hours, a maximum v/c ratio of 1.00 shall be maintained. Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.

The system analysis described in Chapter 7 finds that the region cannot achieve the mobility policy listed in Table 3.6 of the RTP (and Table 7 of the Oregon Highway Plan) within current funding levels or with the mix of investments included in the analysis. Metro and ODOT have committed to regional partners that they will work together to update the interim regional mobility policy to better align with RTP outcomes and advance beyond this traditional mobility performance measure as described in Chapter 8 (Section 8.2.3.1).

3.5.5 Congestion management process

The RTP calls for implementing system and demand management strategies and other strategies prior to building new motor vehicle capacity, consistent with the Federal Congestion Management Process (CMP), Oregon Transportation Plan policies (including Oregon Highway Plan Policy 1G) and Section 3.08.220 of the Regional Transportation Functional Plan (RTFP). 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.

One component of Metro’s Congestion Management Process is a toolbox of congestion reduction and mobility strategies. This toolbox identifies a suite of strategies to manage congestion and address mobility needs prior to utilizing traditional roadway widening and other capacity projects. Prior to adding single occupant vehicle (SOV) capacity, agencies and jurisdictions should give consideration to the various strategies identified in this section, consistent with FHWA direction and RTP and OTP policies. Usually, multiple strategies are applicable within a corridor, while other strategies are intended to be applied region-wide.

The CMP toolbox strategies were assembled to provide a wide range of strategies that could be used to manage congestion region-wide or within congested mobility corridors. They are arranged so that the strategies are considered in order from first to last. Even with the addition of capacity, many of the strategies can be implemented with the project to ensure the long-term management of a capacity project.

The CMP toolbox of strategies is shown in **Table 7**.

Table 3.7 Toolbox of strategies to address congestion in the region

1		<p>Community design strategies</p> <ul style="list-style-type: none"> • Walkable communities and job centers facilitated by compact land use in combination with walking, biking and transit connections • Mixed-used areas and transit-oriented development • Parking management and pricing
2		<p>Travel Information and Incentives strategies</p> <ul style="list-style-type: none"> • Commuter travel options programs • Household individualized marketing programs • Car-sharing and eco-driving techniques • Safe Routes to School programs • Ridesharing (carpool, vanpool) services
3		<p>System management and operations strategies</p> <ul style="list-style-type: none"> • Real-time variable message signs and speed limits • Signal timing and ramp metering • Transit signal priority, bus-only lanes, bus pull-outs • Incident response detection and clearance • Access management (e.g., turn restrictions, medians)
Emerging		<p>Congestion pricing strategies</p> <ul style="list-style-type: none"> • Peak period pricing • Managed lanes • High occupancy toll (HOT) lanes
4		<p>Active Transportation strategies</p> <ul style="list-style-type: none"> • New biking and walking connections to schools, jobs, downtowns and other community places • Bicycle infrastructure (e.g., bicycle racks, lockers and other bicycle amenities at transit stations and other destinations) • Separated pathways and trails
5		<p>Transit strategies</p> <ul style="list-style-type: none"> • High capacity transit • Expanded transit coverage • Expanded frequency of service • Improvements in right-of-way to increase speed and reliability of buses and MAX • Community and job connector shuttles • Park-and-ride lots in combination with transit service
6		<p>Street and throughway capacity strategies</p> <ul style="list-style-type: none"> • Local and arterial street connectivity to spread out travel • Addition of turn lanes at intersections, driveway restrictions and other geometric designs such as roundabouts • Road widening to add new lane miles of capacity (e.g, adding auxiliary lanes, additional general purpose lanes); pricing is considered when adding new throughway capacity in the region

The intent of the CMP Toolbox follows FHWA’s direction to consider all available solutions before recommending additional roadway capacity in transportation system planning, corridor refinement planning and subarea studies. **Appendix L** describes how this information is used in the region’s process and RTP updates to identify needs and inform consideration and prioritization of multimodal strategies and investments to address congestion in the region.

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) in Wilsonville also provides regional transit service, connecting Wilsonville to Portland and communities in Washington and Clackamas counties.



TriMet implements the majority of transit service in the RTP in what is called the Transit Investment Plan (TIP). SMART, C-TRAN and other transit providers complement TriMet's service.

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).

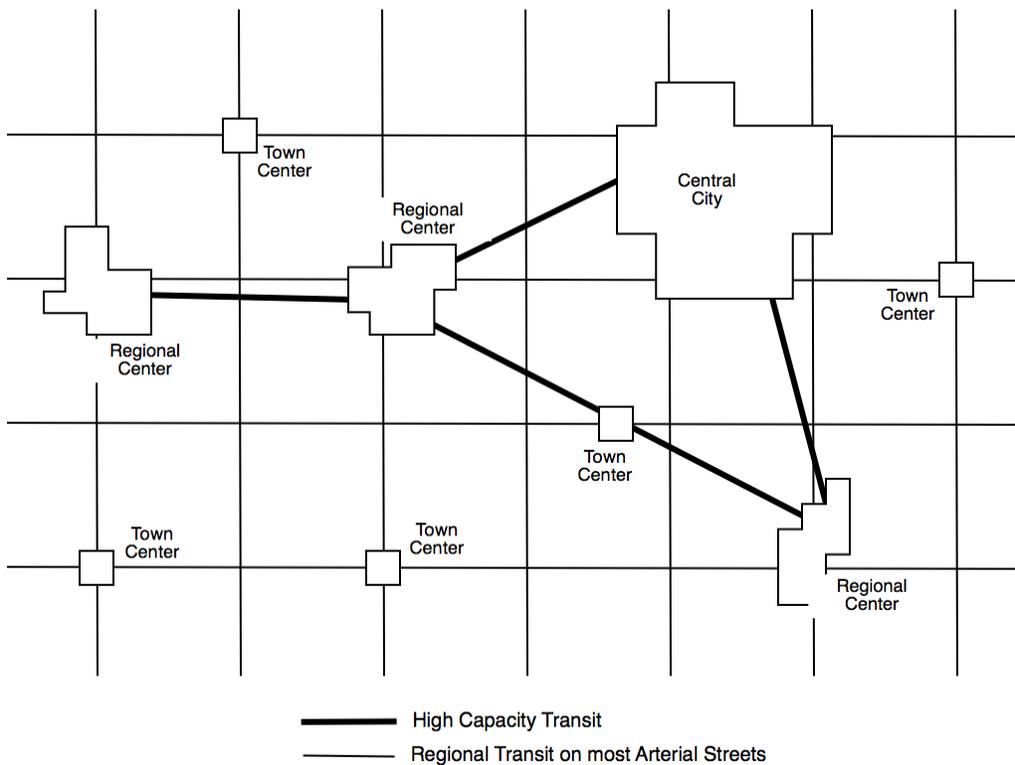
Transit is a partner in supporting the region’s 2040 Growth Concept, which calls for focusing future growth in regional and town centers, station communities and 2040 corridors. A regional transit network, coupled with transit-supportive development patterns and policies that support taking transit, 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 3.14 shows how the regional transit system concept would connect the 2040 centers.

Figure 3.14 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 3.8**.

Table 3.8 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 functional classifications and map

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 3.16**, 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. Click on [2018 RTP Regional Network Maps](#) for online zoomable version of map.

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.

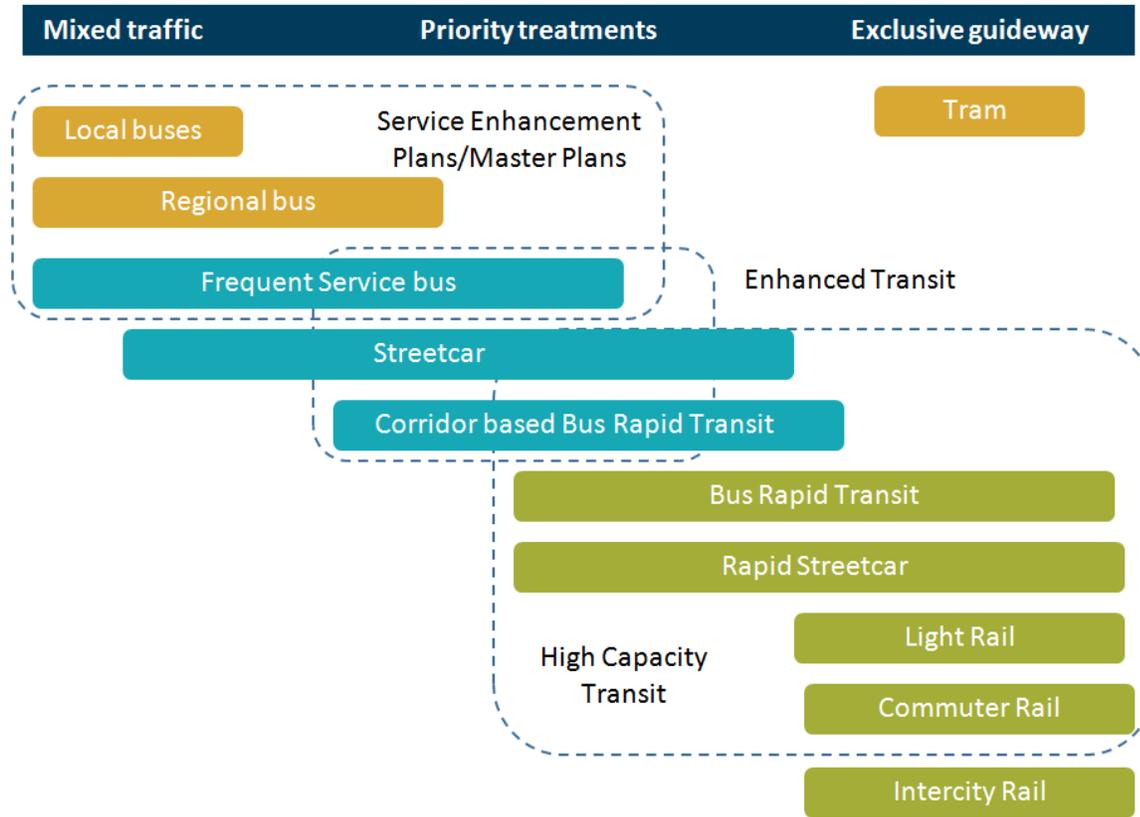
The region's high capacity transit system operates with the majority or all of the service in exclusive guideway. The high capacity transit system is meant to connect to regional centers and carry more transit riders than the local, regional and frequent service transit lines.



The region's high capacity transit system operates with the majority of all of the service in exclusive right-of-way, consisting of five lines over a 60 mile network that serves 97 stations in the city of Portland, and the communities of Beaverton, Clackamas, Gresham, Hillsboro, and Milwaukie; and Portland International Airport .

Figure 3.15 shows the broad transit spectrum that exists or is planned for regional transit system.

Figure 3.15 Regional transit spectrum



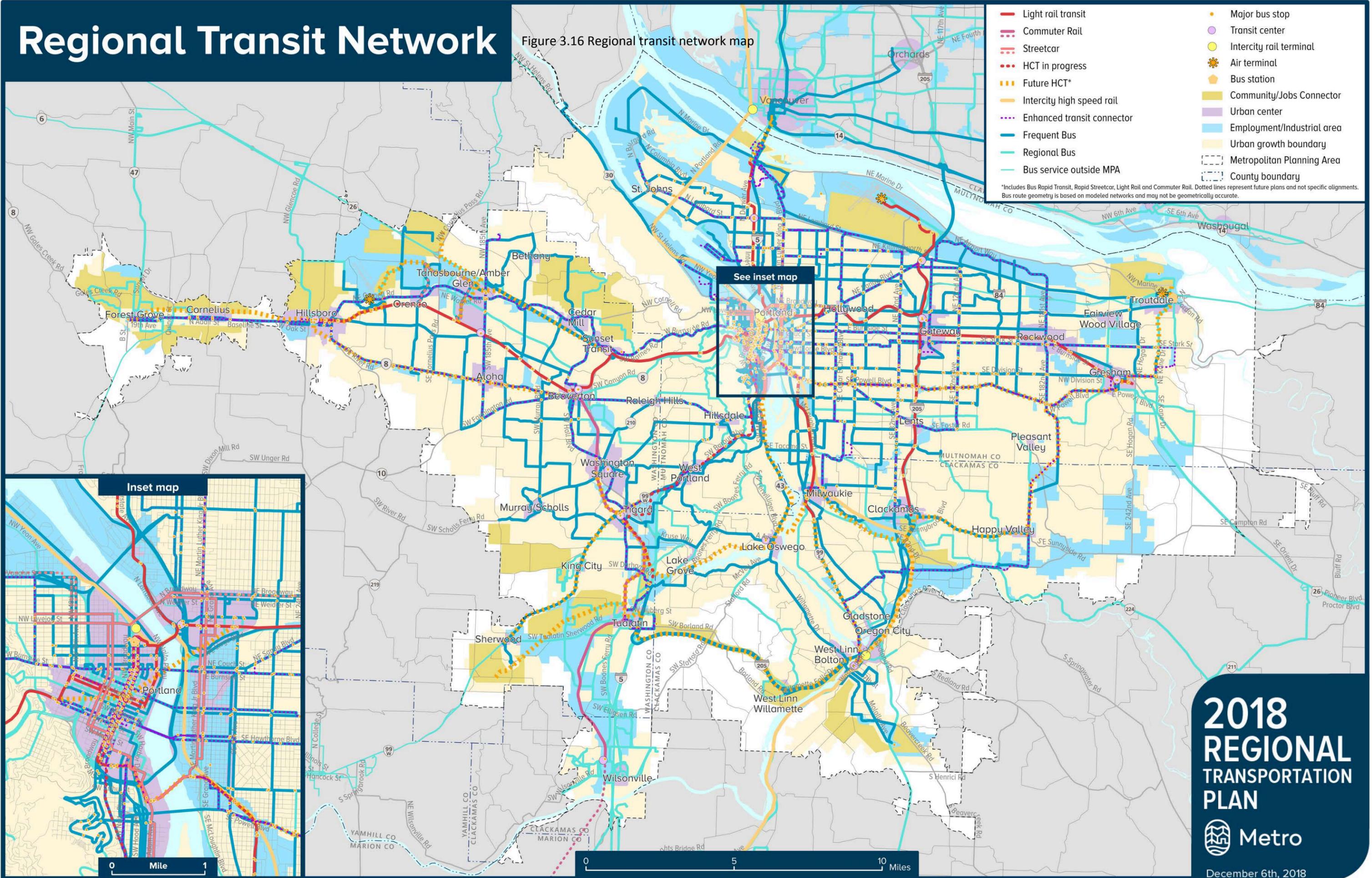
Many variables impact decisions about what type of transit mode and frequencies are most appropriate, including existing and future land uses, transit demand and opportunities and constraints.



Frequent bus routes, like line 57, provide important regional connections between communities and to jobs, medical services and other destinations, and increase access to safe, reliable transportation throughout the region.

Regional Transit Network

Figure 3.16 Regional transit network map



0 Mile 1

0 5 10 Miles

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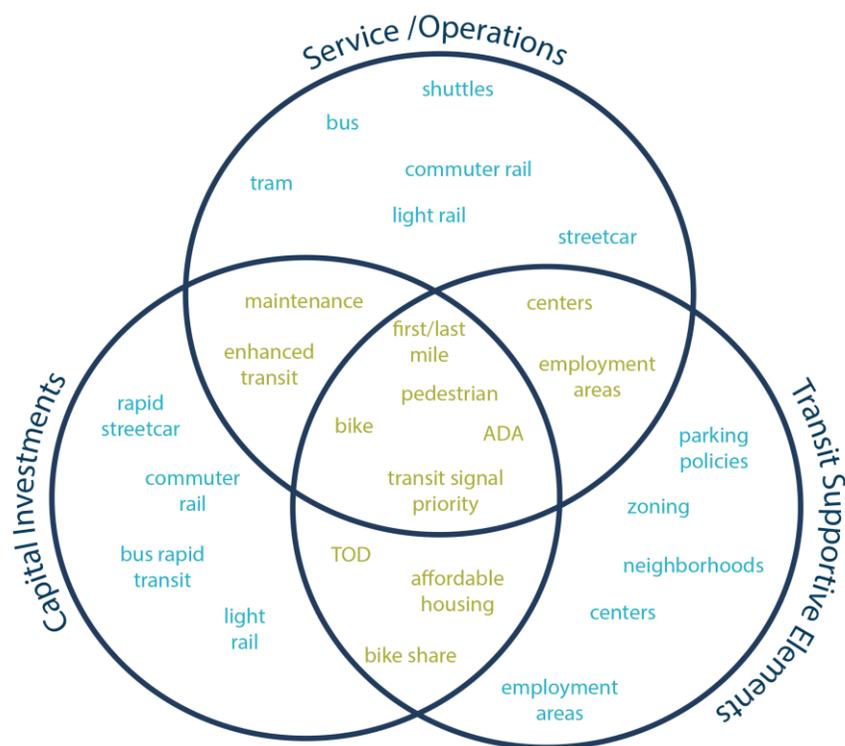
Implementation of the Regional Transit Vision

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 3.17 shows the relationships between these different types of investments.

Figure 3.17 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 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, convenient, accessible and affordable 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.

These policies support multiple RTP goals, including goals for climate leadership and clean air, and are an integral part of implementing the Climate Smart Strategy. Expanding our transit system and use of transit in the region will continue to play a significant role in reducing transportation-related air pollutants, including greenhouse emissions. In addition, ongoing efforts to convert bus fleets to low and zero-emissions vehicles will further reduce emissions in the region.

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 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.

Frog Ferry Passenger River Taxi Service Study

A non-profit group, Friends of Frog Ferry, is pursuing the study of a passenger river taxi service connecting Vancouver, WA with central Portland. Friends of Frog Ferry has compiled an initial business plan and is working to partner with local jurisdictions to evaluate ridership and land development opportunities. Their proposal envisions a project that provides another transportation option and activates the Willamette River.

More information about the study can be found in Chapter 8 and on the project website at frogferry.com.



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 federal transportation performance management implementation. 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.

In addition, TriMet began testing clean fuel buses in 2002 with two diesel-electric hybrids and we currently operate eight hybrids that we began to introduce in 2012. While those buses had some advantages, TriMet ultimately didn't see the performance needed to roll them out system-wide. Through a recent federal grant, as well as support from Portland General Electric, TriMet purchased five electric buses that will soon run on Line 62-Murray Blvd in Beaverton. TriMet continues to look for additional resources for additional testing. While on paper electric buses sound great, TriMet needs to make sure they live up to their promise before rolling them out system-wide. Seeing how these buses operate under real-world conditions will help TriMet assess if these battery-electric buses are a viable and economic option for system-wide expansion.

Whether electricity or hydrogen-powered, cleaner alternative fuels are the future of transit. TriMet's efforts to embark on this test that will move our region one step closer to this vision. In addition, TriMet was just awarded federal funds to purchase additional battery electric buses within the next five years. House Bill 2017 provides an opportunity to further invest in these vehicles as one funding alternative.

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

Key considerations for investments in frequent service are ridership, productivity, and lines that provide historically marginalized communities access to jobs and other community places. 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 community and job connector shuttles increases the convenience of transit, particularly for areas without frequent service transit or where traditional transit service is not viable. Community and job connector shuttles also expands the reach of transit service across the region, which improves access to jobs and community places and can help facilitate 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



The GroveLink bus serves a greater part of the Forest Grove, helping to link residents with downtown locales as well as with TriMet bus line 57.

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 and 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 (e.g., 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, people with lower income, people with limited 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. The framework will vary for each project and should be developed at the time an HCT project is being considered through planning, engineering and construction.

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 3.9** describes the different types of treatments that have the potential to improve reliability.

Table 3.9 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 shown in **Figure 3.18** 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.

Figure 3.18 U.S. high speed intercity passenger rail network



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

More recently, the Oregon Department of Transportation completed its analysis for improved passenger rail service between Eugene-Springfield and Portland – a 125 mile segment of the federally-designated Pacific Northwest Rail Corridor. The results of the study are documented in a Tier 1 Draft Environmental Impact Statement currently under review by the Federal Railroad Administration. Information in the DEIS includes the general rail alignment, communities where stations would be located and service characteristics, such as the number of daily trips, travel time objectives and recommended technologies. In addition, ODOT is looking at ways to improve future commuter rail needs through an update of the Oregon State Rail Plan.

More work is needed to determine what partnerships, infrastructure investments and finance strategies are needed to support improved intercity passenger service to communities outside the

region. 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.

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

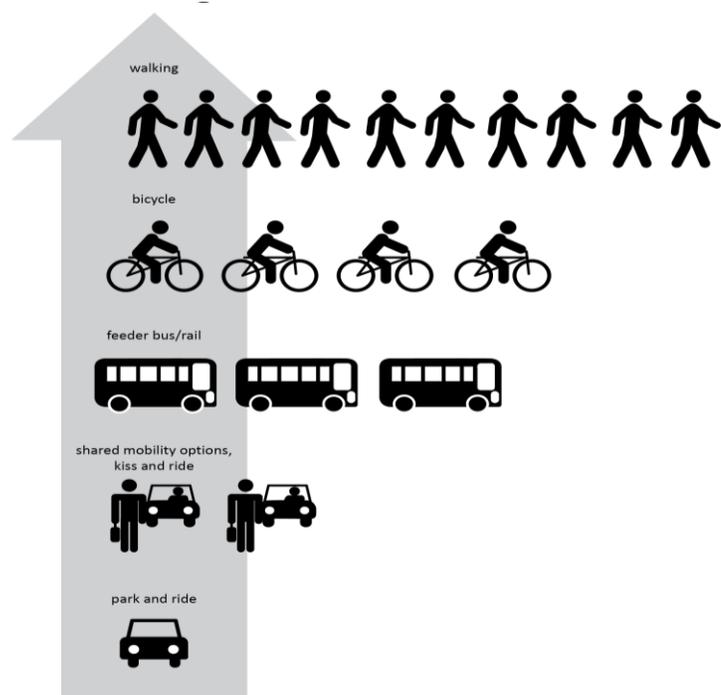
Providing safe and direct walking and biking routes and crossings that connect to transit stops ensures that transit services are fully accessible to people of all ages and abilities. At some point in their trip, all transit riders are pedestrians. The environment where people walk to and from transit 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 3.19** depicts the region’s priorities for providing multi-modal access to the region’s transit system. 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;

Figure 3.19 Regional transit system access priorities



- 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.

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, ride-hailing services Uber and Lyft provided an estimated 10 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.
- The City of Portland recently launched a four-month pilot for shared electric scooters (also known as dockless scooters or e-scooters) in summer 2018. In the first three weeks of the pilot these scooters carried close to 100,000 trips. Following the pilot, the City will evaluate how e-scooters contribute to its mobility, equity, safety, and climate action goals. Metro and its public agency partners will be coordinating with Portland to understand how e-scooters support regional goals, whether they are effective at providing first/last mile connections to transit, and if so, what steps transportation agencies could take to make scooters available for these connections.

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

- Shared electric bikes 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 partner with microtransit or carsharing, pooled ride-hailing services or dockless bike/scooter sharing 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 ride-hailing services 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 ride-hailing services picking people up and dropping them off means that curb space is increasingly valuable, and the use of global positioning systems on ride-hailing vehicles makes it possible to manage where these vehicles drop people off and pick them up. Agencies can manage the curbside to prioritize ride-hailing services carrying more than one passenger and avoid conflicts with transit vehicles.

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

Advancements in technology provide opportunities for the region to proactively improve transit service and efficiency and integrate technological advances in transportation and mobility services that are supportive of and leverage the use of transit. 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 does not 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 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,



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.

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 greater Portland 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.

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

SMART Fare Programs

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).

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.

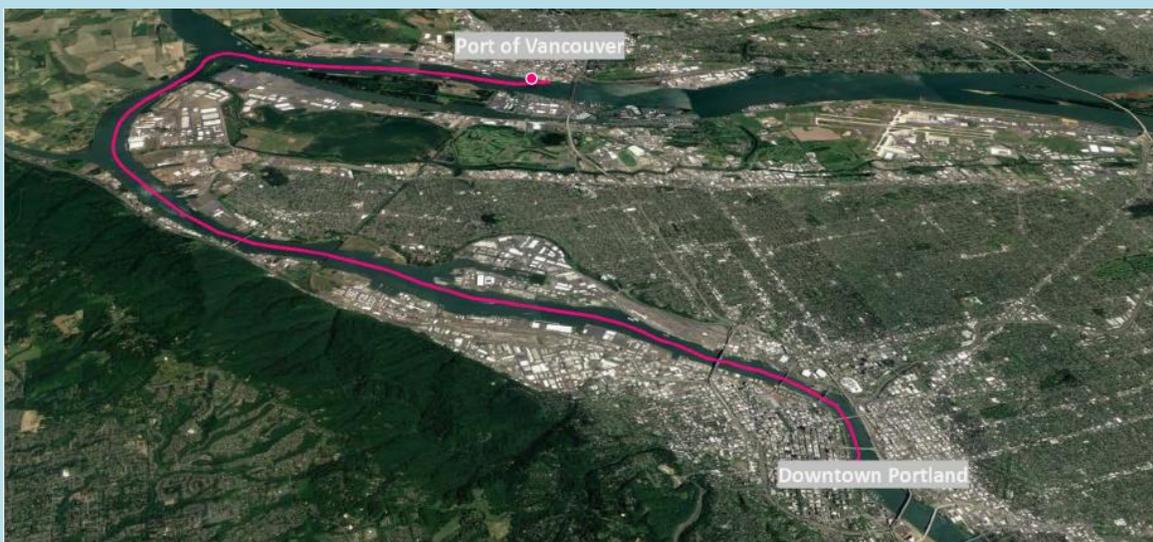
Over the last few years, TriMet has been working toward a reduced fare program for people with limited incomes. A task force of advocates, community members and elected officials recommended a low income fare program where adults at or below 200 percent of the federal poverty level would be eligible 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.

Private efforts to study the potential for passenger ferry service

A non-profit group, Friends of Frog Ferry, is pursuing the study of a passenger river taxi service connecting Vancouver, WA with central Portland. Friends of Frog Ferry has compiled an initial business plan and is working to partner with local jurisdictions to evaluate ridership and land development opportunities. Their proposal envisions a project that provides another transportation option and activates the Willamette River.



Source: Friends of Frog Ferry

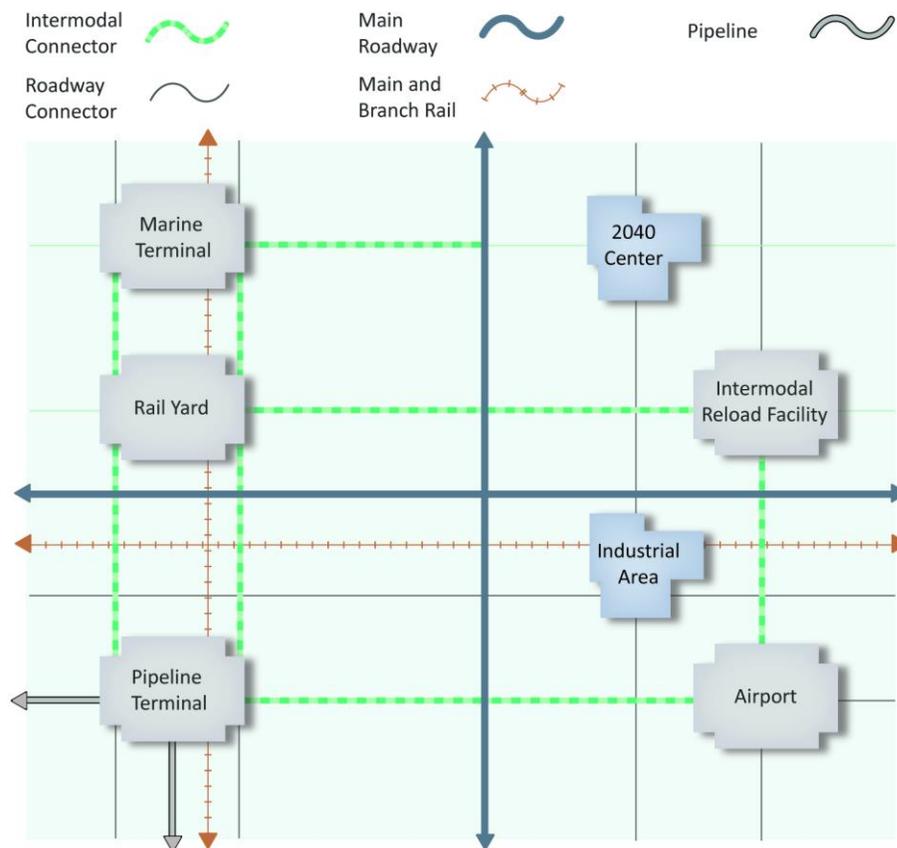
3.7 REGIONAL FREIGHT NETWORK VISION AND POLICIES

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

3.7.1 Regional freight network concept

The Regional Freight Strategy addresses the needs for freight through-traffic as well as regional freight movements, and access to employment and industrial areas, and commercial districts. The Regional Freight Network Concept contains policy and strategy provisions to develop and implement a coordinated and integrated freight network that helps the region’s businesses attract new jobs and remain competitive in the global economy. The transport and distribution of freight occurs via the regional freight network, a combination of interconnected publicly and privately owned networks and terminal facilities. The concept in **Figure 3.20** shows the components of the regional freight system and their relationships.

Figure 3.20 Regional freight network concept



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

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.

Regional Freight Network Policies

- 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.



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 residents and 597,000 jobs to be added

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

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



Reducing delay and increasing 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).

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 multimodal 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.

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.

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.

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

3.7.3 Regional freight network classifications and map

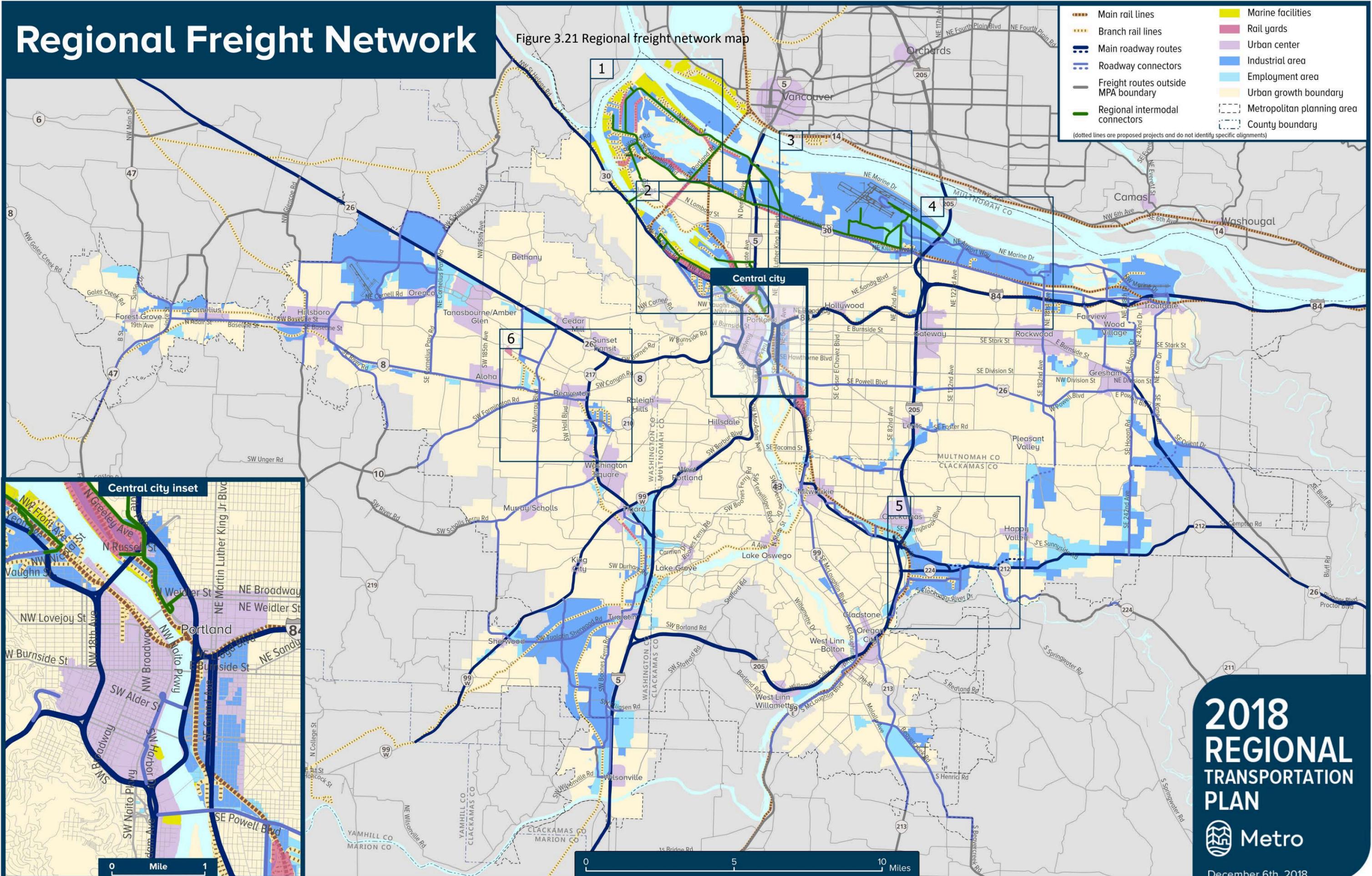
The Regional Freight Network map, shown in **Figure 3.21** applies the regional freight network concept on the ground to identify the transportation networks and facilities that serve the region and the state's freight mobility needs. Click on [2018 RTP Regional Network Maps](#) for online zoomable version of map. 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 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 Airport 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.

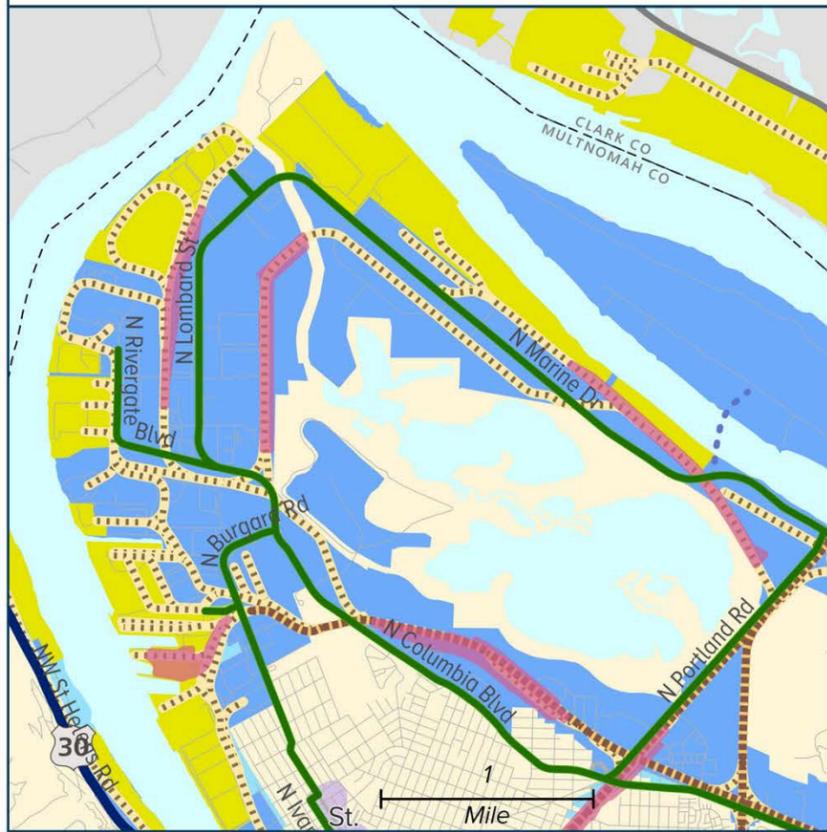
Regional Freight Network

Figure 3.21 Regional freight network map

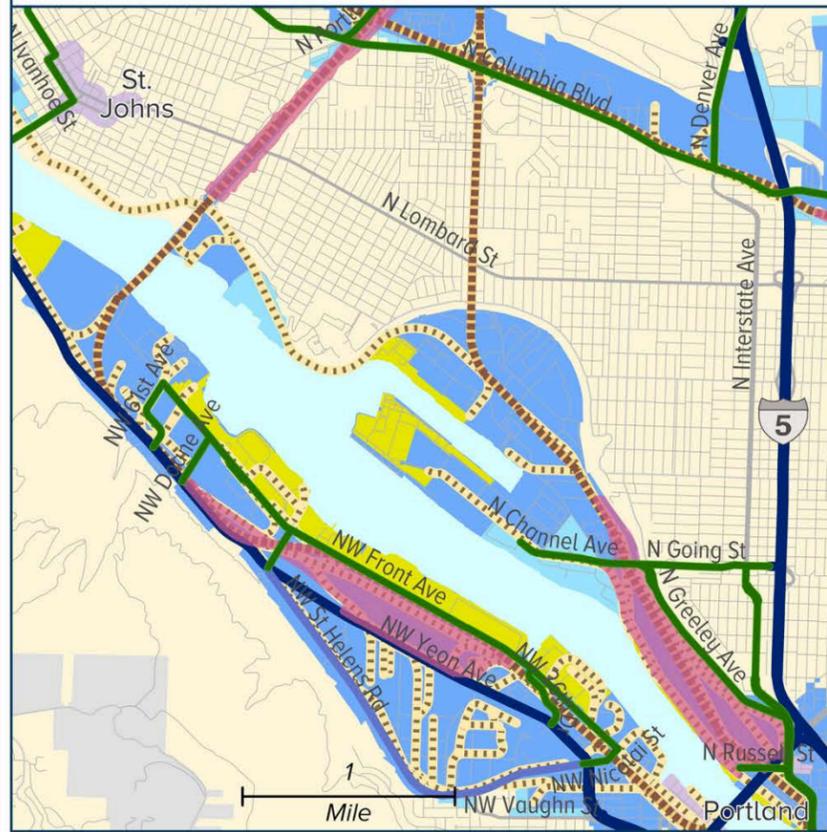


- Main rail lines
 - - - Branch rail lines
 - Main roadway routes
 - - - Roadway connectors
 - Freight routes outside MPA boundary
 - Regional intermodal connectors
 - Marine facilities
 - Rail yards
 - Urban center
 - Industrial area
 - Employment area
 - Urban growth boundary
 - Metropolitan planning area
 - County boundary
- (dotted lines are proposed projects and do not identify specific alignments)

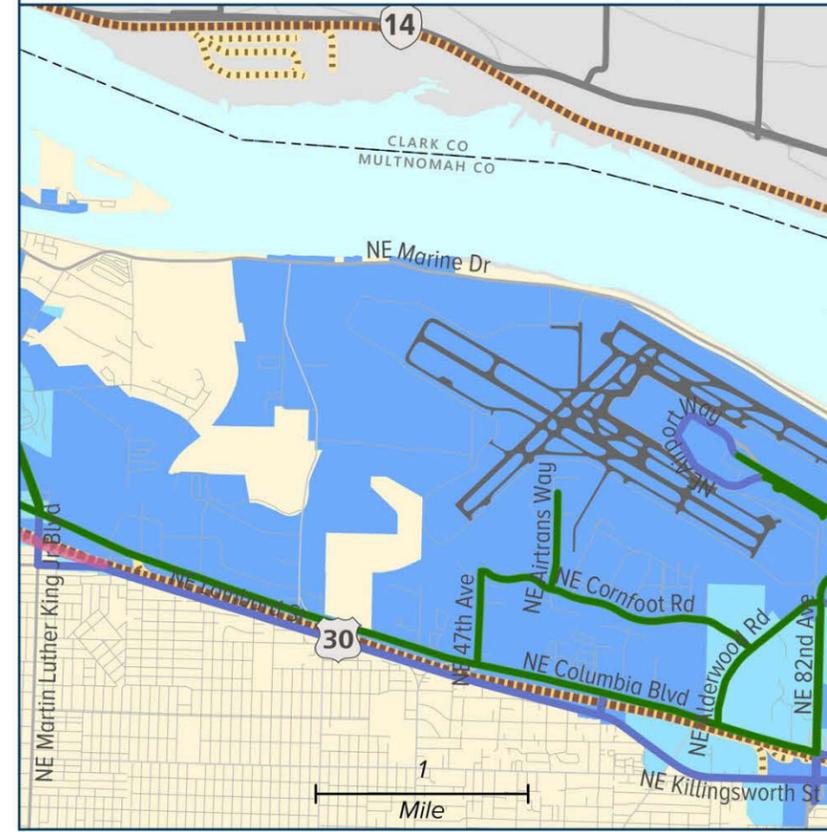
1. North Portland Marine Terminals



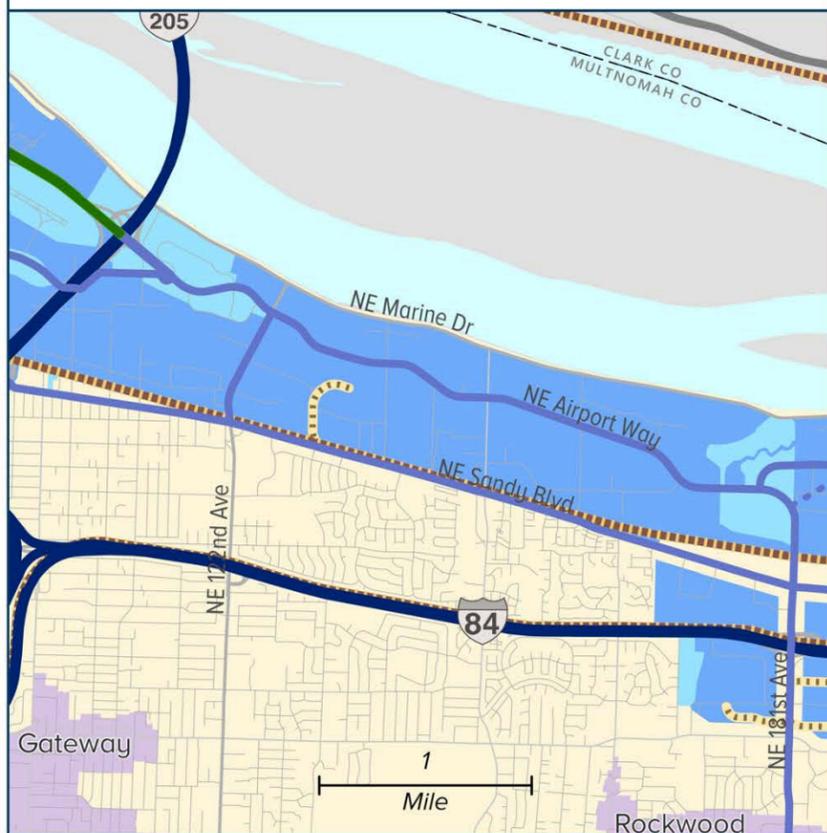
2. NW Industrial and Swan Island



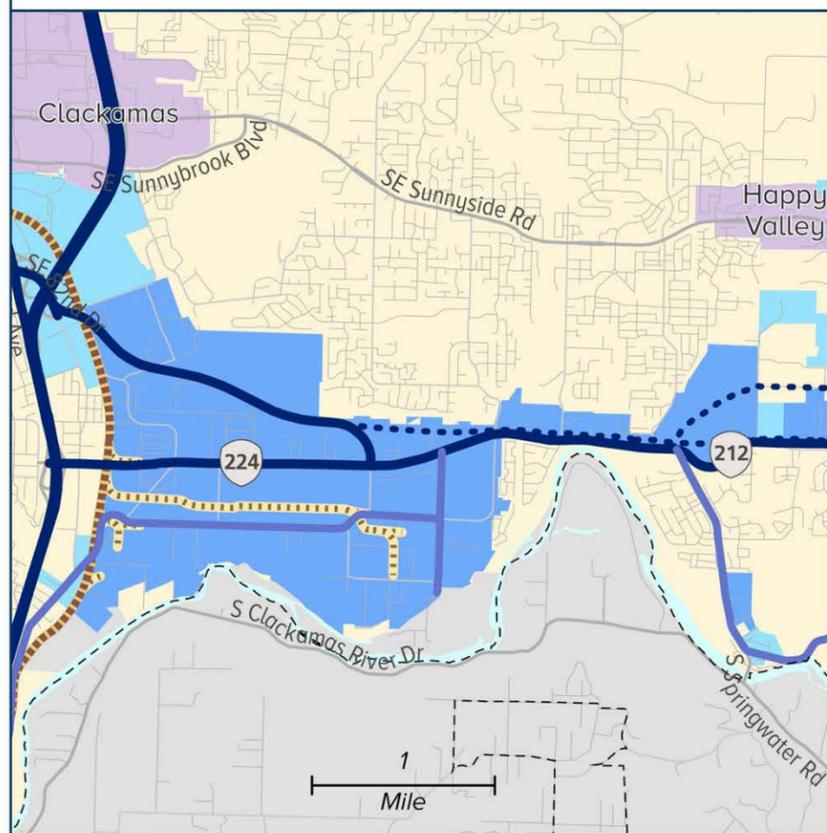
3. Portland International Airport



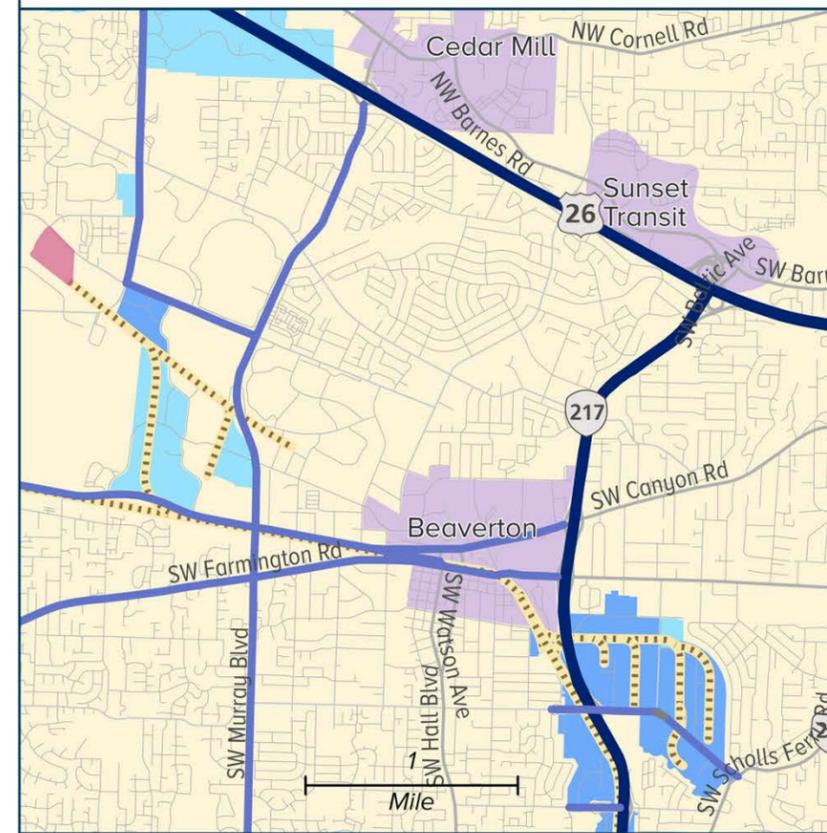
4. Kenton Rail Line/Columbia Corridor



5. Clackamas Industrial Area



6. Beaverton Industrial Area



Legend

(dotted lines are proposed projects and do not identify specific alignments)

- Main rail lines
- Branch rail lines
- Main roadway routes
- Roadway connectors
- Freight routes outside MPA boundary
- Regional intermodal connectors
- Marine facilities
- Rail yards
- Urban center
- Industrial area
- Employment area
- Urban growth boundary
- Metropolitan planning area
- County boundary

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 older adults.
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



Many people in the region incorporate walking into daily travel. It is important that routes and crossings are safe and comfortable for people of all ages and abilities.

¹⁴ Underserved populations include low income, low-English proficiency, minority, solder adults (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.

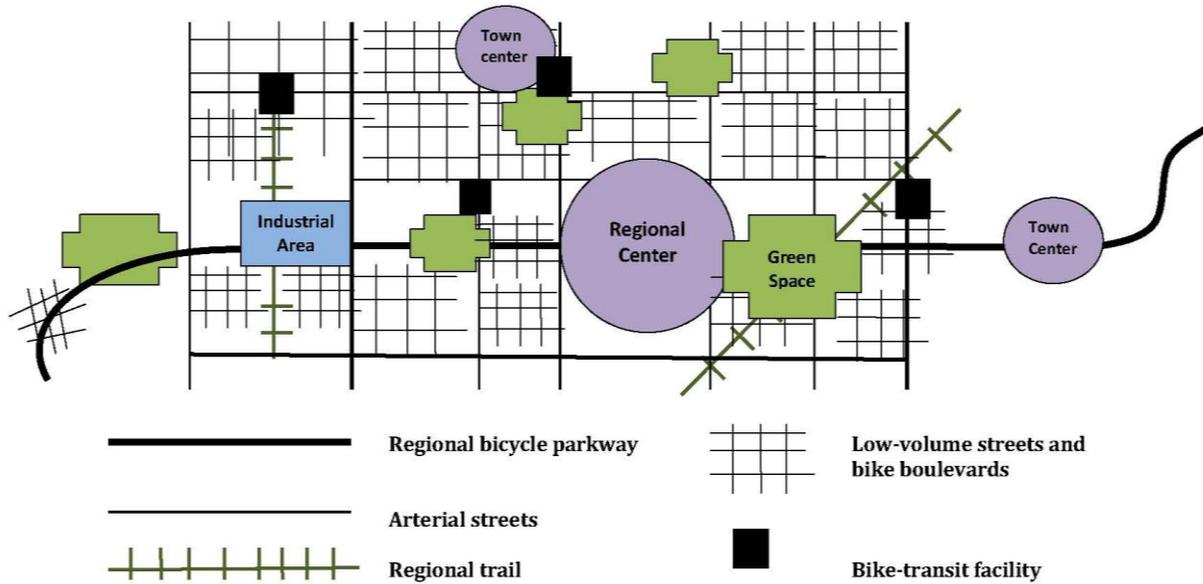
3.9.1 Regional bicycle network concept

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 3.22 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 3.22 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 Network Policies

- | | |
|-----------------|---|
| Policy 1 | Make bicycling the most convenient, safe and enjoyable transportation choice 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 choice for short trips of 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, and defined a three mile catchment area for bicycle improvements and a half mile catchment area for pedestrian improvements.¹⁷

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.

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

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 percent since 1995.¹⁸ When bicycling is safe, comfortable, convenient and enjoyable, people have the option of making some of those short trips by bicycle.

Actions to implement this policy can be found in Chapter 12 of the 2014 Regional Active Transportation Plan.

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 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:

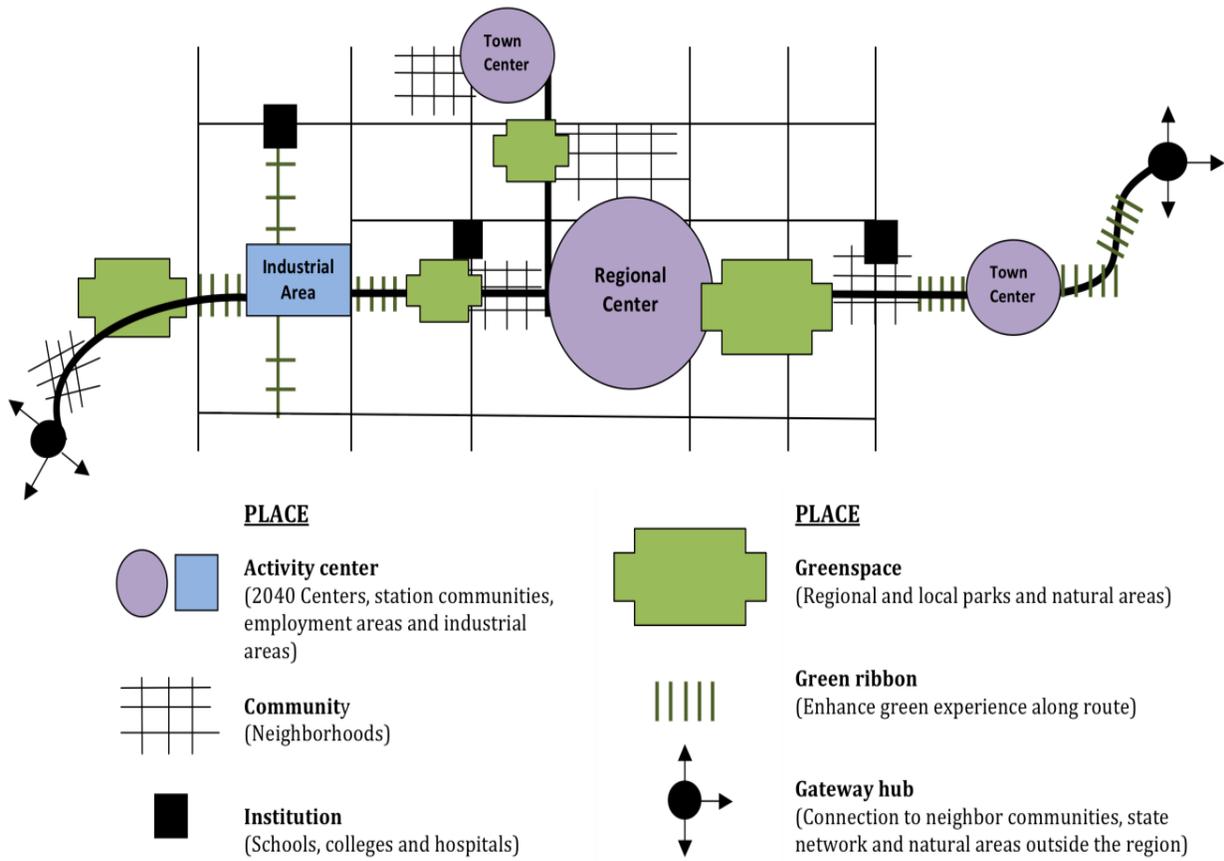
- A green environment with natural features such as trees or plantings (some will already be green, while others will be made greener as part of bike parkway development)
- Comfort and safety provided by protection from motorized traffic
- Large volumes of cyclists traveling efficiently with minimal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

¹⁸ 2011 Oregon Household Activity Survey.

Figure 3.23 illustrates this policy concept in the context of the regional bicycle parkway concept.

Figure 3.23 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.



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

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.

3.9.3 Regional bicycle network functional classifications and map

This section describes the regional bicycle network functional classifications shown on **Figure 3.24**, the Regional Bicycle Network. Click on [2018 RTP Regional Network Maps](#) for online zoomable version of map.

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 3.24** 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.

The regional bicycle network has a functional hierarchy similar to that of the regional motor vehicle network. **Figure 3.24** provides a vision for a future bicycle network; for a map of current bicycle facilities in the region, refer to Chapter 4.

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 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.



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

- **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.

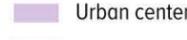
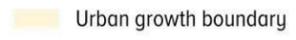
Which areas are designated as bicycle districts should be considered further in future Regional Transportation Plan and ATP updates. For example, areas around bus stops with high ridership should be evaluated as potential bicycle districts (light rail station areas are currently identified as bicycle 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.

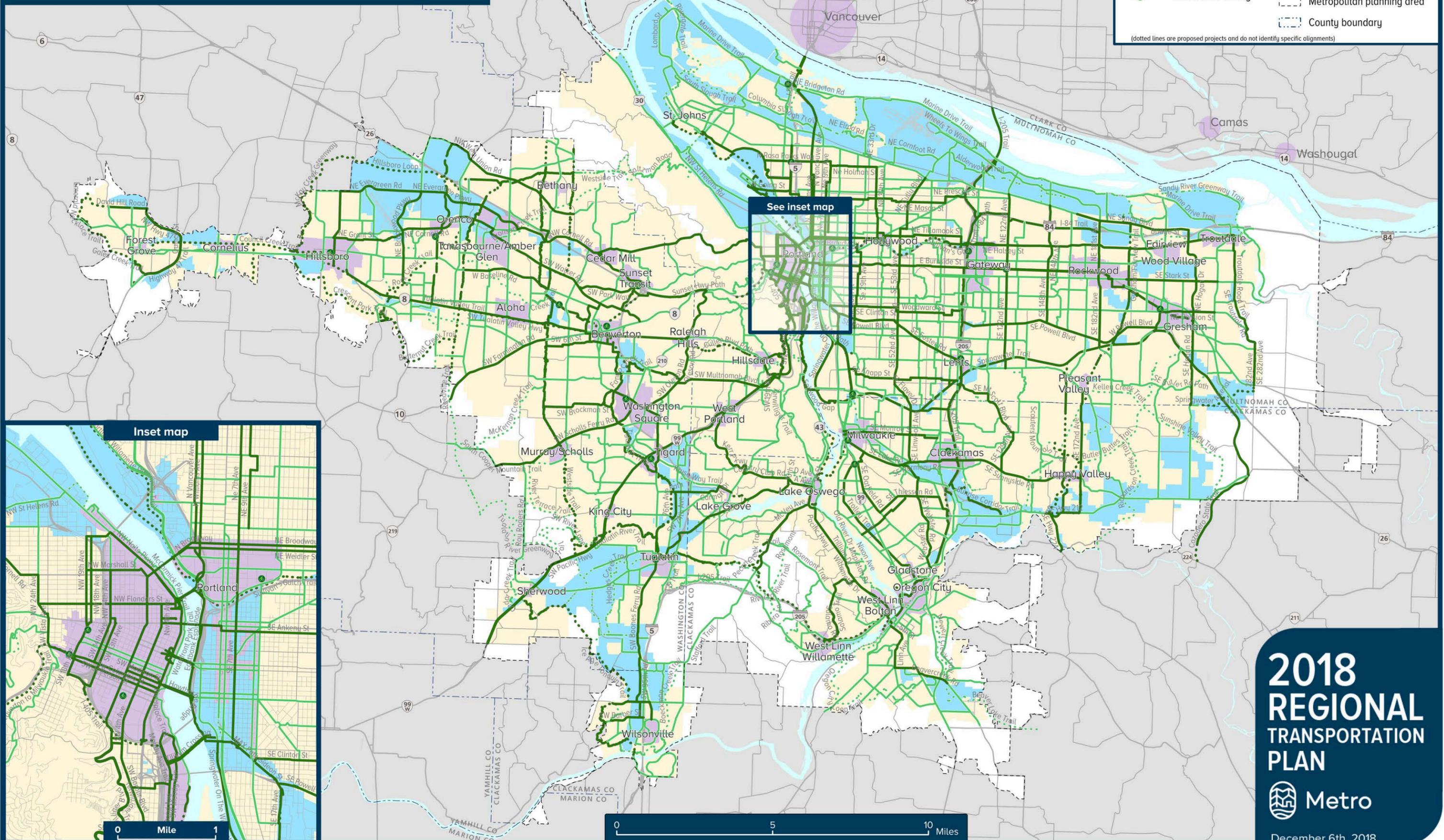
Bicycle Parkways and Regional Bikeways typically follow arterial streets but may also be located on collector and low-volume streets. On-street bikeways should be designed using a flexible “toolbox” of bikeway designs, including bike lanes, cycle tracks (physically separated bicycle lanes) shoulder bikeways,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

Regional Bike Network

Figure 3.24 Regional bike network map

	Bicycle Parkway		Urban center
	Regional Bikeway		Employment/Industrial area
	Bike transit facility		Urban growth boundary
			Metropolitan planning area
			County boundary

(dotted lines are proposed projects and do not identify specific alignments)



2018 REGIONAL TRANSPORTATION PLAN



December 6th, 2018

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



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.

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 places to cross the street can be few and far between, and 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.
- Provision of safe crossings of streets and controlled pedestrian crossings on major arterials.
- 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.



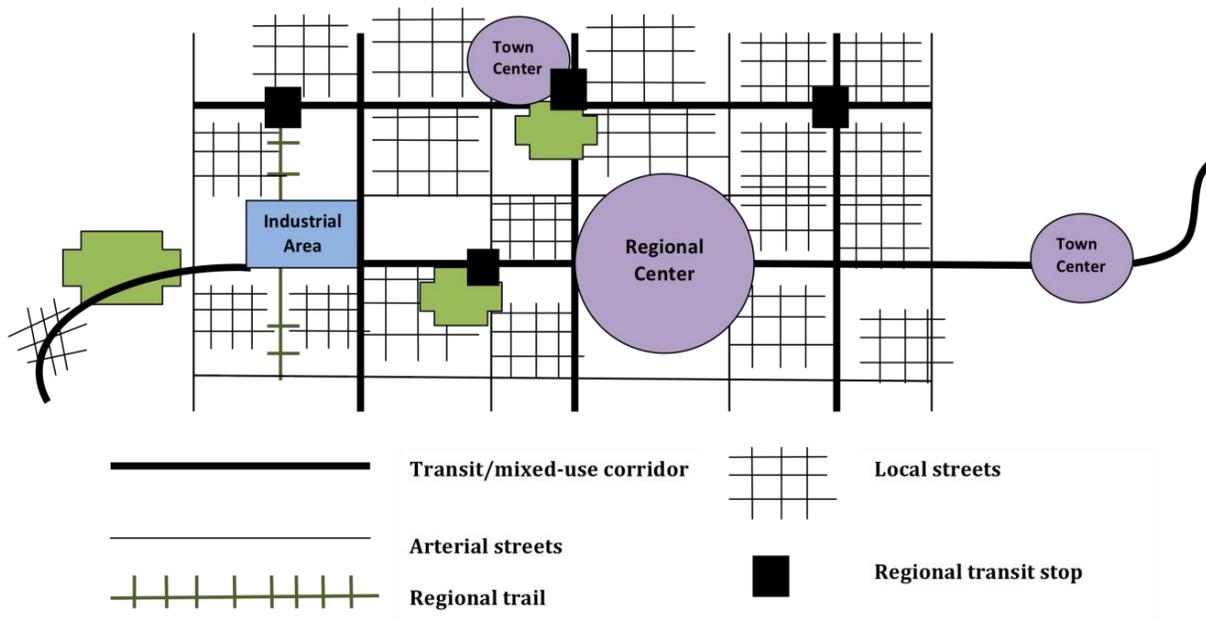
Walkability plays an important role in economic development by supporting commercial activity in centers. The RTP considers walking and bicycling equal with other transportation modes, and prioritizes short walking and bicycling trips.

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

Figure 3.25 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 choice for short trips of 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 of all ages and abilities.

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

In addition to being the most basic form of transportation, walking is an important form of exercise and is the most popular recreational activity in Oregon.¹⁹ The average length of a walking trip in the region is about half a mile. Today 15 percent of trips made in an auto are less than one mile.²⁰ 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.²¹

¹⁹ Oregon's 2017 Statewide Outdoor Recreation Survey shows that 83 percent of Oregonians walk on local streets and sidewalks for recreation, making this the most popular recreational activity in the state.

²⁰ 2011 Oregon Household Activity Survey.

²¹ Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements Under Federal Transit Law

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

Actions to implement this policy can be found in Chapter 12 of the 2014 Regional Active Transportation Plan.

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.



Children need a safe pedestrian environment, especially for walking to and from school and parks.

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 where 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.

Pedestrian access along transit-mixed use corridors is improved with features such as wide sidewalks, reasonably spaced marked crossings and buffering from adjacent motor vehicle traffic.



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

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 with language isolation live. Transportation is the second highest 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 3.26**, 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 3.26** provides a vision for a future pedestrian network; for a map of existing pedestrian facilities in the region, refer to Chapter 4.

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.

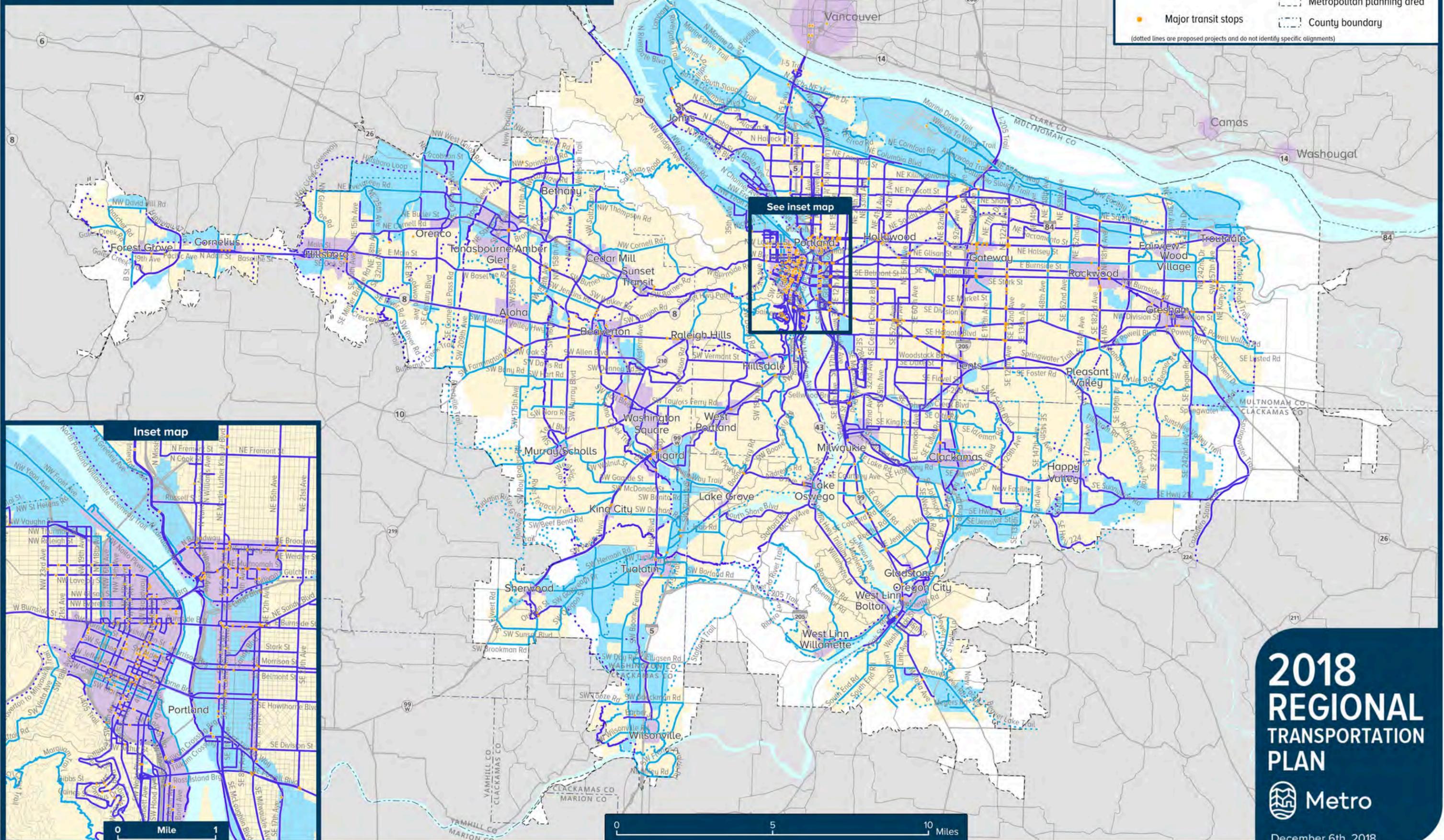
Figure 3.26 applies the regional pedestrian network concept on the ground, illustrating how different regional pedestrian facilities work together to form a comprehensive network that allows people to walk to transit, schools, employment centers, parks, natural areas and shopping. Click on [2018 RTP Regional Network Maps](#) for online zoomable version of map.

Regional Pedestrian Network

Figure 3.26 Regional pedestrian network map

	Pedestrian Parkway		Urban center
	Regional Pedestrian Corridor		Employment/Industrial area
	Major transit stops		Urban growth boundary
			Metropolitan planning area
			County boundary

(dotted lines are proposed projects and do not identify specific alignments)



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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 as the 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 3.10 provides examples of TSMO strategies for each of the investment areas and **Figure 3.27** illustrates how some of these strategies are implemented in the communities across the region.



The region continues to seek opportunities to use national best practices in linking planning and operations to improve system efficiency and performance, and demonstrate the cost-effectiveness of the region’s toolkit of multimodal system management and operations strategies in solving regional transportation challenges.

Table 3.10 Examples of TSMO strategies and investments

<p>Multimodal Traffic Management</p> <ul style="list-style-type: none"> • Traffic signal coordination • Transit signal priority treatment • Detection and countdown timers for bicycles and pedestrians
<p>Traveler Information</p> <ul style="list-style-type: none"> • Real-time traveler information for freeways, arterials and transit • Enhanced multi-modal traveler information tools on mobile devices
<p>Traffic Incident Management</p> <ul style="list-style-type: none"> • Add and coordinate traffic cameras and other sensors • Expand incident management teams and training
<p>Transportation Demand Management</p> <ul style="list-style-type: none"> • 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

Figure 3.27 Illustration of transportation system management and operations strategies



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 in combination with adequate transit service options.
- 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 that are 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 in combination with adequate transit service options.

Congestion pricing—sometimes called value 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. Successful implementation of pricing often includes improved transit service. 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 conducted a feasibility analysis to explore the options available and determine how congestion (value) 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), improve 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.

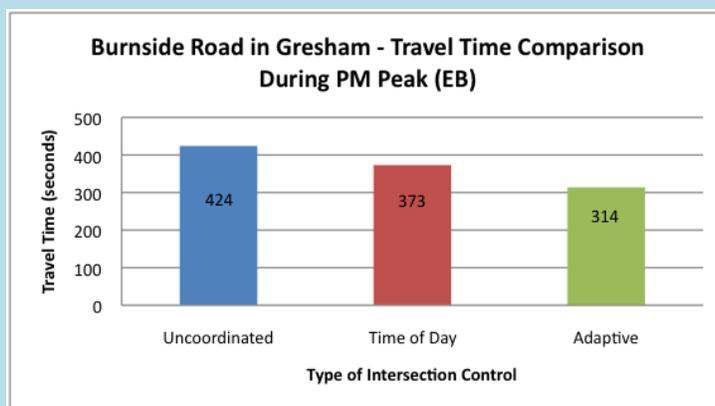
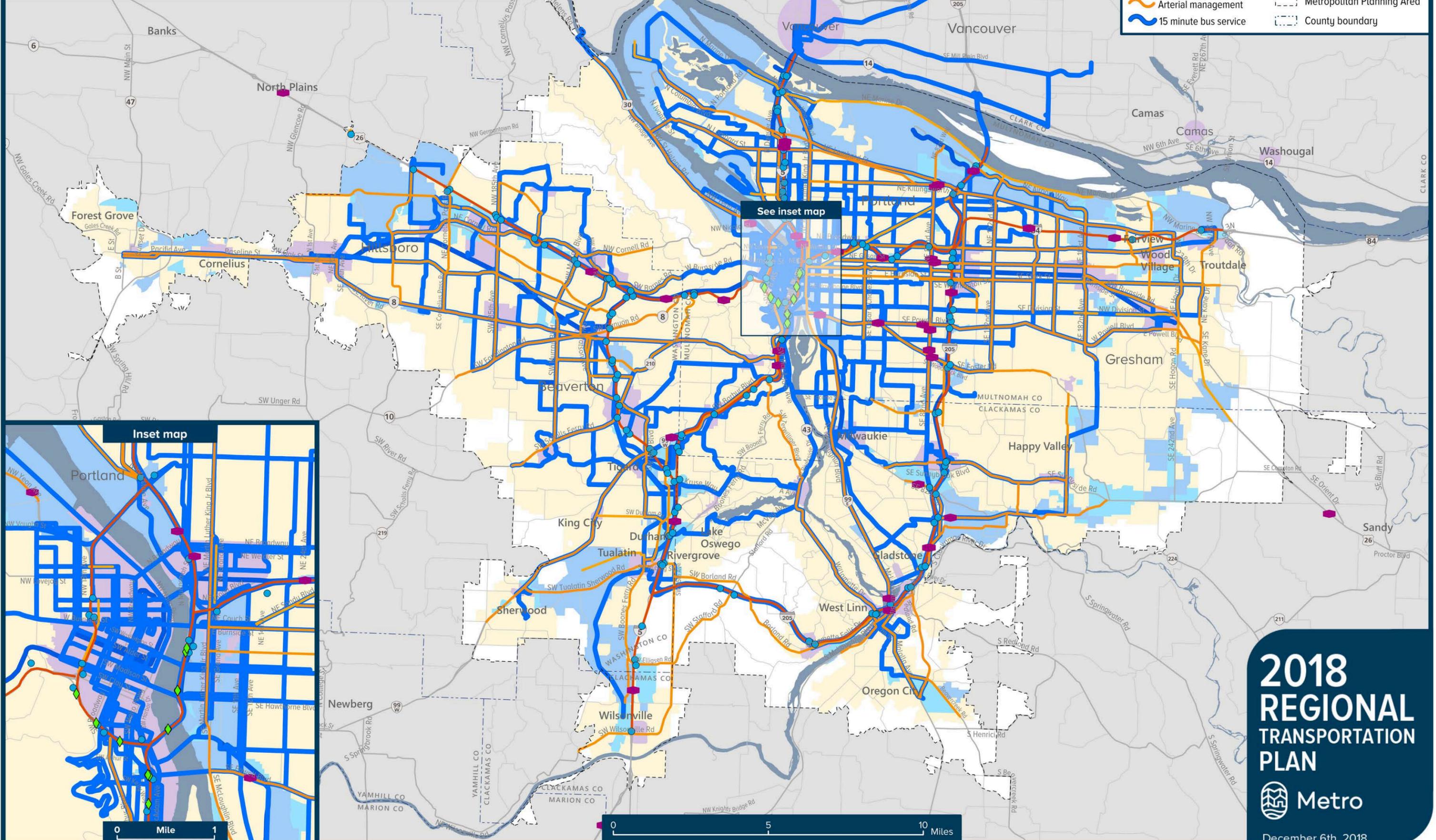


Figure 3.28 shows where some of these strategies are envisioned to be applied in the region to address growing congestion and improve safety, efficiency and reliability of the system.

Transportation System Management and Operations Network

Figure 3.28 Transportation System Management and Operations Network Map

- Variable message sign
- ◆ Variable speed limit
- Ramp meter
- Freeway management
- Arterial management
- 15 minute bus service
- Urban center
- Employment/Industrial area
- Urban growth boundary
- Metropolitan Planning Area
- County boundary



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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 3.11**. 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 percent 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 percent.

Active traffic management can:

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

Table 3.11 Detecting and clearing incidents on throughways quickly restores lost capacity

Number of throughway lanes	Percent of facility capacity lost by lane 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: Highway Capacity Manual. Transportation Research Board, National Research Council, Washington, D.C., 2000.

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

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.

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 recognition within children that they have multiple options for how to travel.

Benefits of using travel options include 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.



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



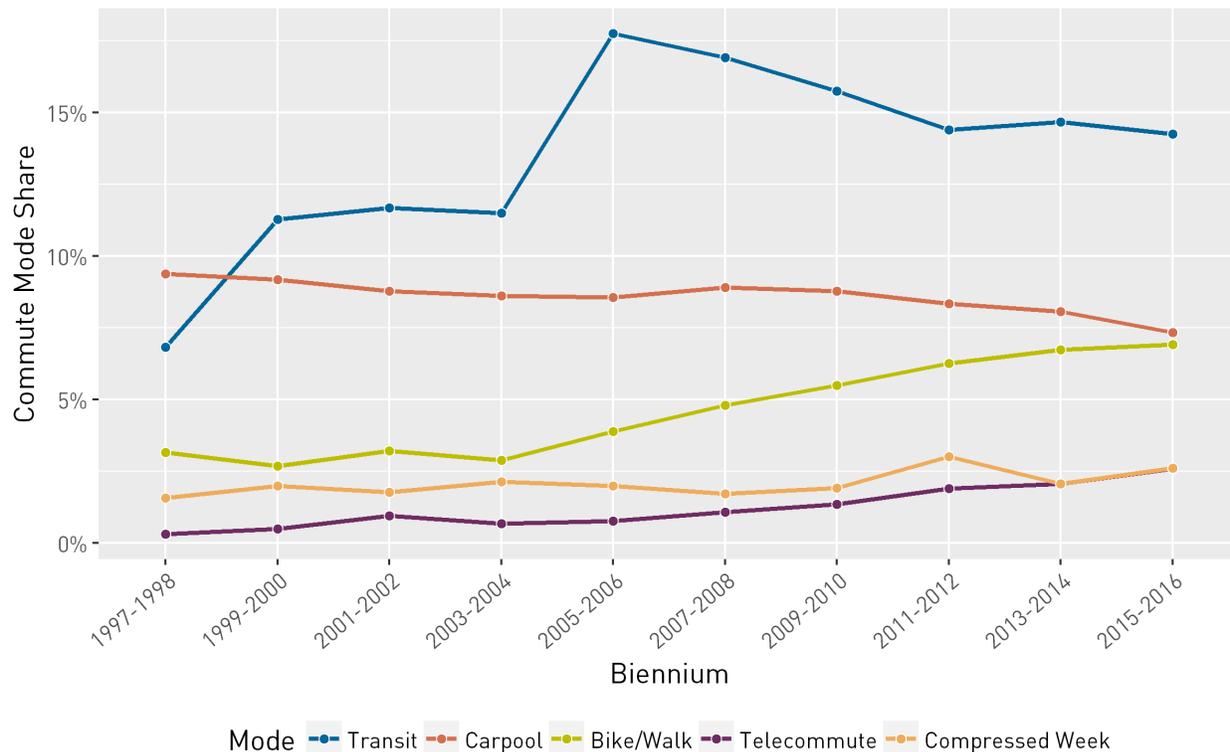
RideWise, a program of Ride Connection, provides travel training for older adults and people with disabilities at no cost and is available in Wilsonville through a partnership with SMART.

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)

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

Shown in **Figure 3.29**, 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.

Figure 3.29 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.

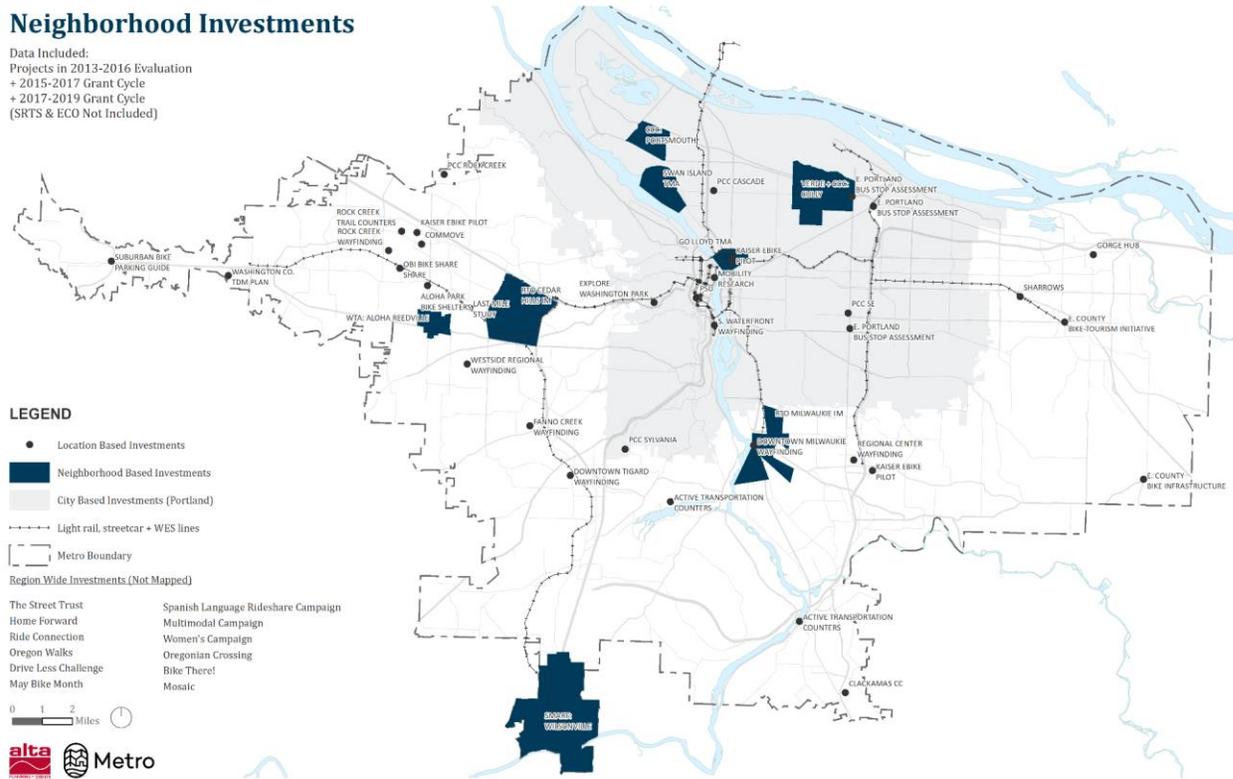
Metro leads the region’s TDM efforts through the RTO program. The RTO program consists primarily of a series of local efforts, led by regional and local governments, education, and not-for-profit partners. These partners produce educational events and outreach to connect with the public. Their efforts 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 3.30** illustrates where local partnerships have conducted RTO events or programming. The map highlights that RTO efforts are not present in much of the region outside the city of Portland.

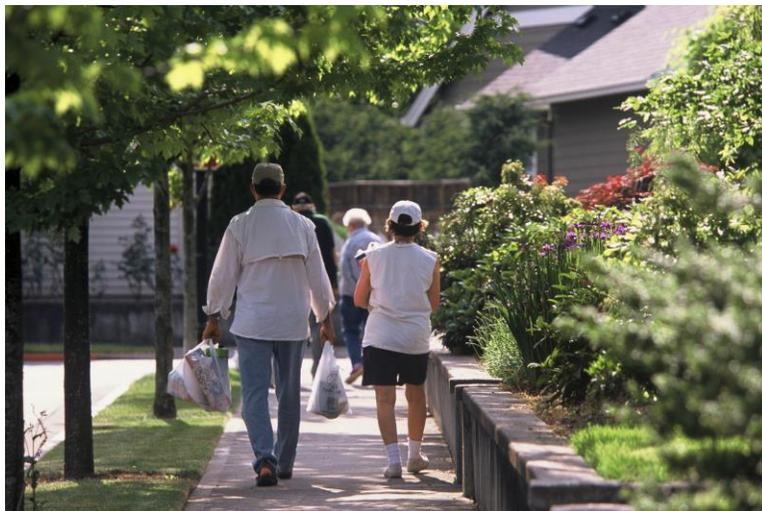
Figure 3.30 Local partnerships and investments by Regional Travel Options program

Neighborhood Investments

Data Included:
 Projects in 2013-2016 Evaluation
 + 2015-2017 Grant Cycle
 + 2017-2019 Grant Cycle
 (SRTS & ECO Not Included)



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 community-based outreach efforts.



Programs offered at the neighborhood level provide the ideal scale for promoting and encouraging greater use of transportation options. A majority of the trips people make throughout the day are for shopping, leisure activities, or recreation, and begin and end at home.

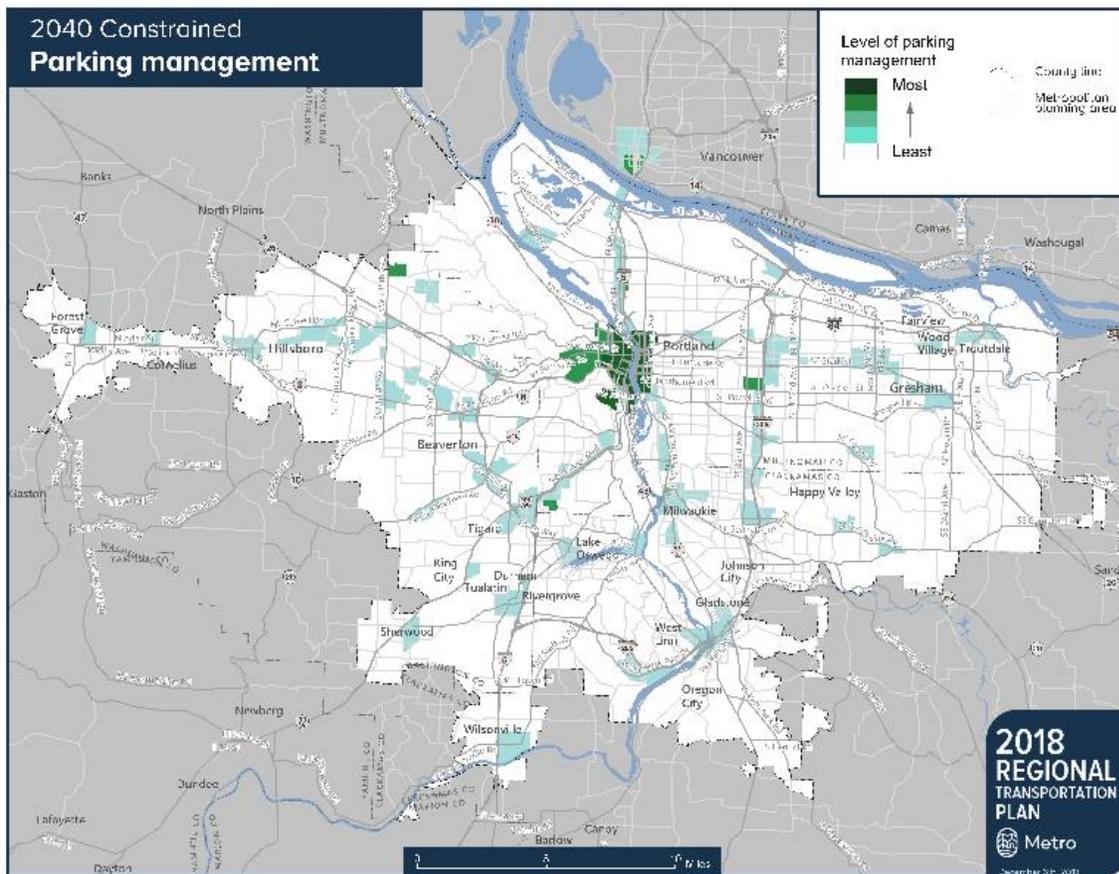
TSMO Policy 7. Manage parking in mixed-use centers and corridors served by frequent transit service and good biking and walking connections to reduce the amount of land dedicated to parking, encourage parking turnover, increase shared trips, biking, walking and use of transit, reduce vehicle miles traveled 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 address potential spillover impacts. A regional parking management strategy would assist local jurisdictions' efforts to implement parking management.

Figure 3.31 shows general locations where parking costs and management strategies were assumed for purposes of the RTP system evaluation. Chapter 8 (Section 8.2.3.14) describes future work to update this policy.

Figure 3.31 Areas assumed to have parking management in the region (2040)



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.

If you picnic at Blue Lake or take your kids to the Oregon Zoo, enjoy symphonies at the Schnitz or auto shows at the convention center, put out your trash or drive your car – we’ve already crossed paths.

So, hello. We’re Metro – nice to meet you.

In a metropolitan area as big as Portland, we can do a lot of things better together. Join us to help the region prepare for a happy, healthy future.

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