CHAPTER 2

VISION, CONCEPTS AND POLICIES:

WHAT IS OUR VISION FOR THE TRANSPORTATION SYSTEM?

2.0 INTRODUCTION

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

The overall vision and supporting policies are aimed at better integrating transportation and land use efforts to sustain the region's economic competitiveness and prosperity, protect farms and natural areas, promote vibrant, compact communities, provide safe and reliable travel choices, reduce global warming and enhance our quality of life. This plan is 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 specific elements of the vision.

This chapter is organized into the following sections:

2.1 Outcomes-based framework to guide planning and decision-making: The section describes the outcomes-based approach to which the RTP must respond, linking transportation to a broader set of desired outcomes for vibrant communities, a healthy economy, equity and the environment.

2.2 Integrated land use and transportation vision: This section describes the 2040 Growth Concept vision and establishes the primary mission of the plan as a key tool for implementing the 2040 Growth Concept and supporting local aspirations for growth.

2.3 Goals, objectives and targets for a 21st century transportation system: This section lays out ten goals, supporting objectives and performance targets for the regional transportation system. The goals, objectives and targets establish policy and investment priorities that will guide future planning, investment decisions and monitoring.

2.4 Regional system definition: This section defines and illustrates the components that make up the regional transportation system.

2.5 Regional network concepts and policies: This section describes each of the network concepts to guide the development and implementation of different parts of the system. The network concepts establish a vision and supporting policies for street 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.

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

Transportation planning is not just an exercise in analyzing numbers and defining projects. Shorter-term circumstances such as the current economic recession and longer-term concerns such as climate change demand that we do things differently and make a new approach to our planning responsibilities all the more timely.

In 2008, the Metro Council and our regional partners adopted six desired outcomes to guide regional planning for the future.[1]

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

The RTP must also respond to the six desired outcomes in order for the region to be a responsible steward of public investment and the social, built and natural environments that shape our communities. This means local, regional and state governments must partner with the private sector to preserve and enhance the quality of life, our economy and the environment now and for future generations. It also means making transportation investment decisions based on achieving the multiple outcomes we are seeking rather than a single focus on addressing traffic congestion.

WHAT OUTCOMES ARE WE TRYING TO ACCOMPLISH?

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

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

SAFE AND RELIABLE TRANSPORTATION – People have safe and reliable transportation choices that enhance their quality of life.

LEADERSHIP ON CLIMATE CHANGE – The region is a leader in minimizing contributions to global warming.

CLEAN AIR AND WATER – Current and future generations enjoy clean air, clean water and healthy ecosystems.

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

As adopted by the Metro Council and MPAC in 2008 by Resolution No. 08-3940.

[1] Metro Resolution No. 08-3940 expressed the intent of Metro and its regional partners to use a performance-based approach to guide policy and investment decisions in the region. The resolution (1) affirmed a definition of a successful region, which have become known as the "six desired outcomes" and (2) directed staff to work with regional partners to identify the performance measures, targets, actions and decision-making process necessary to create successful communities.

To this end, the RTP uses an outcomes-based framework to inform transportation planning and investment decisions based on three balanced objectives:

1. **Equity –** Responsibility of the plan to the people of the region.

The plan identifies an interconnected and multi-modal transportation system that provides safe and affordable travel choices for everyone and equal access to work, education and nature for the region's residents. The implementation of the plan must ensure that the benefits and impacts of transportation decisions are fairly distributed to all people, regardless of race, national origin, or income, and that everyone has access to meaningful participation.

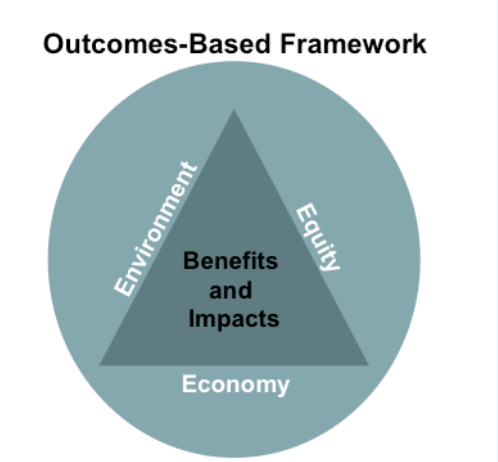
2. **Environment** - Responsibility of the plan to the landscape of the region.

The implementation of the plan should ensure that the multi-modal transportation system protects and enhances the region's unique setting and natural environment, planned urban form and cultural legacy.

3. **Economy** - Responsibility of the plan to the economic prosperity of the region.

The implementation of the plan should provide a multi-modal transportation system that supports a healthy regional economy and helps the region's businesses and industries remain competitive. Moving forward, the region must sharpen its efforts to quantify, assess and consider economic return on public investments in transportation infrastructure, in order to spend public funds wisely in support of the regional economy.

The RTP framework uses economic, social, and environmental objectives to guide planning and investment decisions.



Applying this framework to transportation planning and decision-making acknowledges that financial, cost-benefit, and economic considerations are not the sole drivers of transportation projects. Instead, it reflects a more balanced approach that embraces the concept that the economy, equity, and the environment must all be considered on a level playing field.

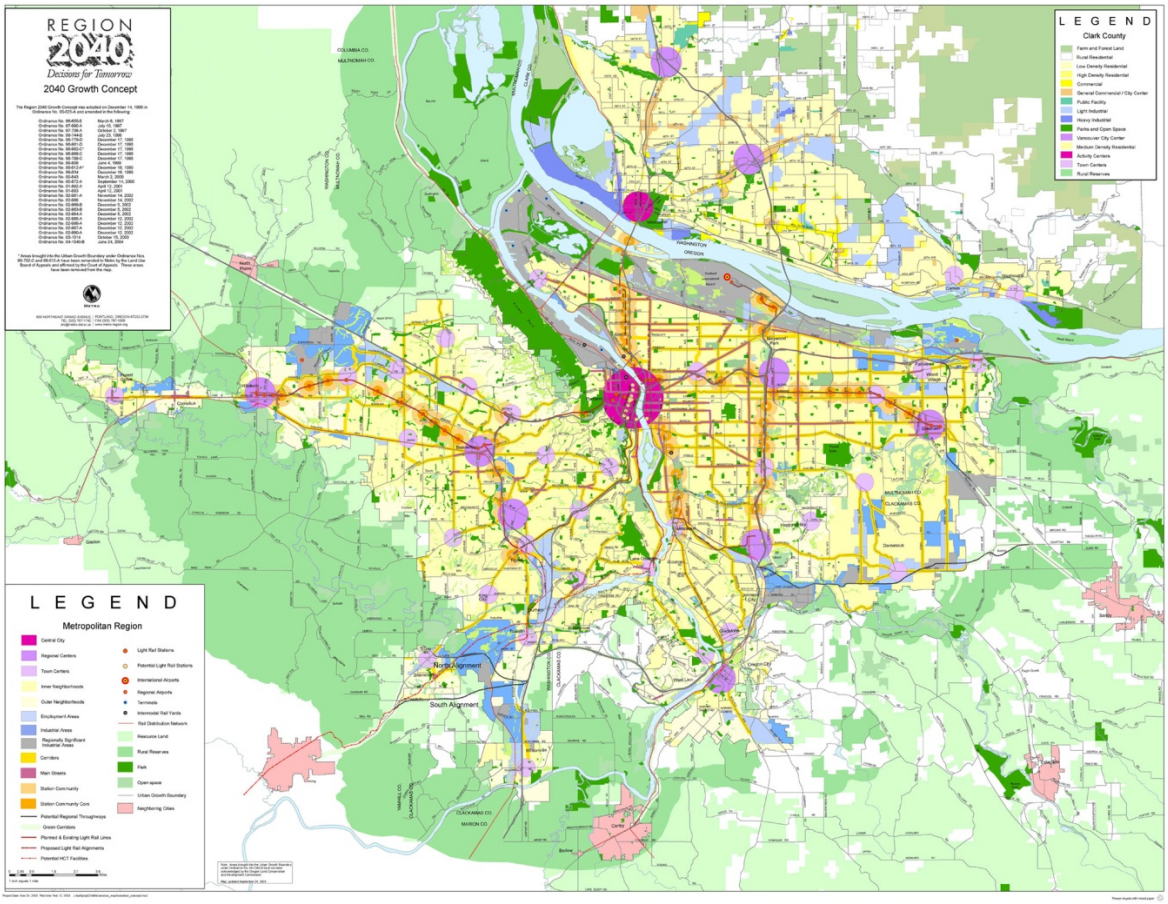
An outcomes-based planning and decision-making framework forms the foundation for the rest of the plan to ensure transportation decisions support this larger set of responsibilities and the six desired outcomes.

2.2 INTEGRATED LAND USE AND TRANSPORTATION VISION

In 1995, the Portland region adopted the 2040 Growth Concept, the long-range plan for managing growth that merges land use and transportation planning to reinforce the objectives of both. The unifying theme of the 2040 Growth Concept is to preserve the region's economic health and livability and plan for growth in the region in an equitable, environmentally-sound and fiscally-responsible manner.

The 2040 Growth Concept includes land-use and transportation building blocks as shown in **Figure 2.1**. It concentrates mixed-use and higher-density development in "urban centers"; "light-rail station communities;" "corridors" and "main streets". The 2040 Growth Concept includes plans for high-capacity transit to connect the Portland central city and seven regional centers. Frequent bus service, often at 15-minute intervals, is envisioned to connect "town centers" with the central city and regional centers.

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



The 2040 Growth Concept expresses the region's aspiration to incorporate population growth within existing urban areas as much as possible and expand the urban growth boundary only when necessary. Implicit in the 2040 Growth Concept is the understanding that compact development is more sustainable, more livable and more fiscally responsible than low-density sprawl, and will help reduce the region's carbon footprint.

Increased pedestrian and bicycle access and new transit and road capacity are needed to achieve the 2040 Growth Concept vision and support the region's economic vitality. Transportation and the economy are closely linked and investments that serve certain land uses or transportation facilities may have a greater economic return than others. Focusing transportation investments and other strategies to support the gateway function of our transportation system is the primary way in which to strengthen that gateway role for the region and the rest of the state. This means ensuring reliable and efficient connections between intermodal facilities and destinations within and outside the region to promote the region's function as a gateway for trade and tourism.

2040 Growth Concept Land-use Design Types

The 2040 Growth Concept land uses, called 2040 Design Types, are arranged in a hierarchy. RTP investments are focused in the primary and secondary land uses, referred to as 2040 Target Areas. The hierarchy also serves as a framework for prioritizing RTP investments. **Table 2.1** lists the 2040 design types based on this hierarchy.[2]

Table 2.1
2040 Growth Concept land-use design types

2040 Target Areas		
Primary land-uses	**Secondary land-uses**	**Other urban land-uses**
• Portland central city • Regional centers • Industrial areas • Freight and passenger intermodal facilities	• Employment areas • Town centers • Station communities • Corridors • Main streets	• Inner neighborhoods • Outer neighborhoods

Different parts of the region are at different stages of implementing the 2040 Growth Concept. As a result, different areas may have different transportation investment needs and priorities that will require substantial public and private investment over the long-term. **Table 2.2** summarizes infrastructure investment strategies for each stage of implementation.

[2] More detailed descriptions of the land use and transportation elements of each 2040 Design Type can be found in the Regional Urban Growth Goals and Objectives and Regional Framework Plan.

Table 2.2
Priority infrastructure investment strategies

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

Community Building Concept

Transportation planning focused on community building outcomes will help protect our region's natural and cultural legacy and serve as an economic catalyst for businesses and jobs. The community building concept recognizes the important role of transportation in placemaking to achieve the 2040 Growth Concept vision for a strong economy, a healthy environment and communities that serve the needs of all. The concept calls for cultivating great communities by investing in the community assets essential to making downtowns, main streets and employment areas better places to live and work. Typically, these are

investments that help revitalize downtowns and main streets or provide critical access to industrial lands and freight intermodal facilities.

The community building concept recognizes the important role of transportation in placemaking to achieve a strong economy, a healthy environment and communities that serve the needs of everyone.

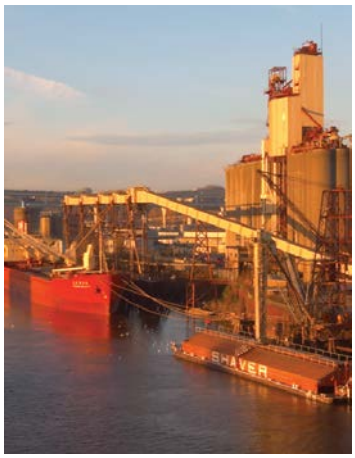
Centers and mainstreets

A diverse, walkable community depends on transportation infrastructure that provides a variety of ways to get around - serving pedestrians, bicyclists and transit-riders as well as drivers. The concept emphasizes streetscape retrofits, street connectivity, transit, sidewalks, bicycle and trail connections in downtowns and along main streets to leverage higher density mixed-use development and transit investments such as frequent bus, street car or high capacity transit. Centers and main streets should be optimized for pedestrians, bicycles and transit users.

For example, an attractive, tree-lined main street, complete with wide sidewalks and "street furniture" – benches, bus shelters, trash cans – is a source of community pride and a magnet for walkers, shoppers and tourists. High quality transit service in these areas further supports placemaking objectives and provides important access and circulation.

Industrial and employment areas

In industrial and employment areas, the community building concept emphasizes providing critical freight access to the interstate highway system and protecting interchange capacity to help the region's businesses and industry in these areas remain competitive. This means strategically adding road capacity to arterials and building new street connections in these areas in addition to providing access to support commercial delivery activities and upgrading main line and rail yard infrastructure. Using public transportation investments to leverage community aspirations, desired growth and private investment in 2040 centers, corridors and employment areas contributes to the quality of life and economic vitality of the region.



Providing freight access to the interstate highway system in industrial and employments areas helps the region's industry remain competitive.

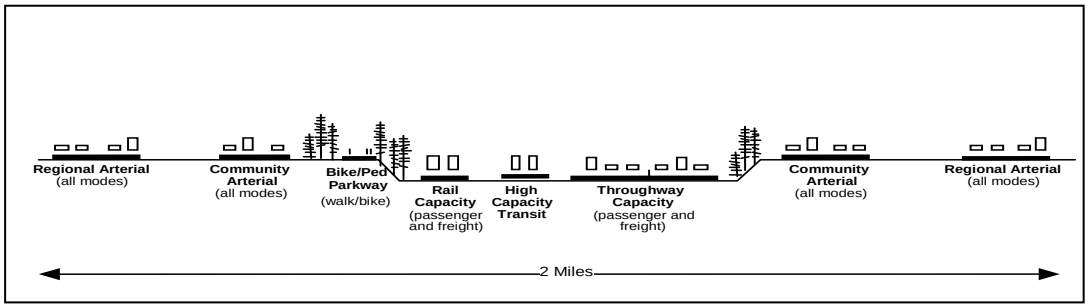
Regional Mobility Corridor Concept

The regional mobility corridor concept integrates arterial streets, throughways, high capacity transit, 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.[3] 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. 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 2.2**.

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

Figure 2.2
Regional Mobility Corridor Concept



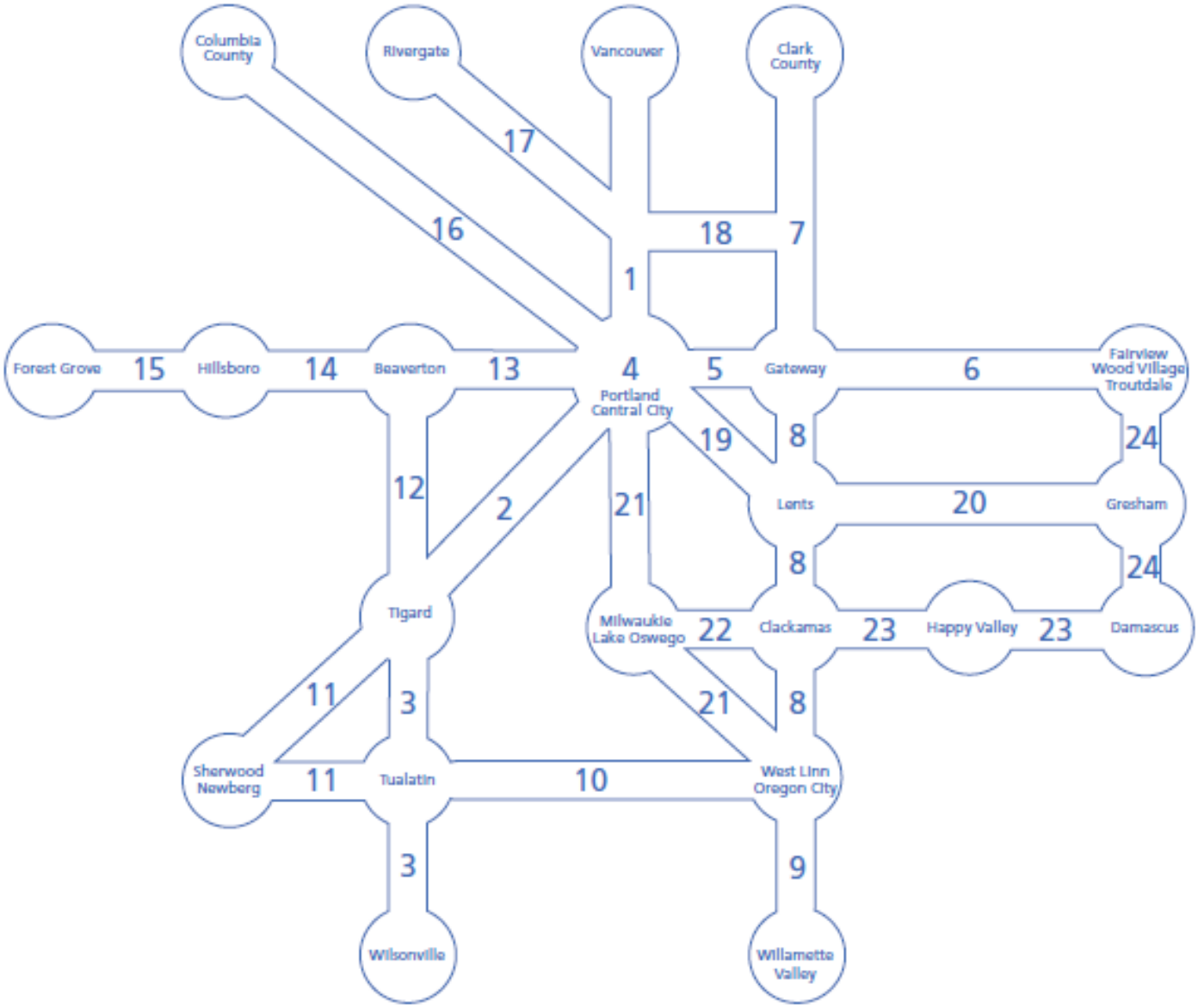
Note: Idealized concept for illustrative purposes showing recommended range of system analysis for the evaluation, monitoring, management and phasing of investments to throughways, arterial streets and transit service in the broader corridor. The illustration is modeled after I-84 between 12th and 60th avenues in Northeast Portland.

Figure 2.3 shows the general location of mobility corridors in the region.

[3] See 2.5.5.1 Regional Bicycle System for more information about the bicycle parkway concept.

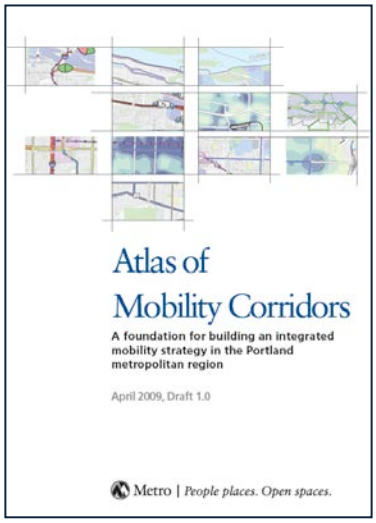
Figure 2.3

Mobility Corridors in the Portland Metropolitan Region



The Mobility Corridor Strategies provided in the Appendix provides a summary of the 24 corridors, describing facilities, functions, land uses, and documenting transportation needs and strategies for addressing them.

Atlas of Mobility Corridors



The Atlas of Mobility Corridors is a way to visually present current land use and multi-modal transportation performance data for each of the region's major travel corridors. For each of the 24 corridors, the Atlas provides a general overview that includes location in the region, primary transportation facilities and land use patterns, an assessment of performance by travel mode for each mobility corridor, and documents needs and proposed solutions as identified in the RTP. The first Atlas was published in 2009 as part of the last RTP update. The next version of the Atlas will coincide with the completion of the 2014 RTP.

The Atlas enhances the region's ability to analyze and compare data between corridors. This information will be used to help identify the most cost-effective strategies and investment priorities for each corridor and serve as a framework for monitoring how well different strategies are working in each corridor over time. The Atlas serves as the region's Congestion Management Process (CMP) monitoring and reporting documentation.

2.3 GOALS, OBJECTIVES AND TARGETS FOR A 21ST CENTURY TRANSPORTATION SYSTEM

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

The RTP vision statement reflects the public's desired outcomes for the region's transportation system and reinforces the shared regional land use and transportation vision for the Portland metropolitan region – the 2040 Growth Concept. This vision is further described through the ten goals and objectives presented in this section. The vision for the RTP is to ensure that the Portland region remains prosperous and vibrant by improving safety, expanding transportation choices for everyone, enhancing human health and protecting the natural environment.

The overarching vision for the RTP reflects the public's desired outcomes and ensures that:

> *In the 21st Century, the Portland metropolitan region remains a vibrant and extraordinary region, with a world-class transportation system that is well-maintained and provides efficient movement of people and goods.*
>
> *This system sustains the region's economic competitiveness and prosperity, protects the region's environment, enhances human health and operates in an attractive and safe setting--it is a system that serves everyone.*
>
> *The system is fiscally sustainable and leverages community aspirations for revitalization and growth in downtowns, centers, main streets, and employment areas.*
>
> *The system manages both demand and capacity, employs the best technology, and joins rail, highway, street, bus, air, water, pedestrian and bicycle facilities into a seamless and fully interconnected system.*

Goal 1: Foster Vibrant Communities and Efficient Urban Form

Land use and transportation decisions are linked to optimize public investments and support active transportation options and jobs, schools, shopping, services, recreational opportunities and housing proximity.

- **Objective 1.1 Compact Urban Form and Design** - Use transportation investments to reinforce growth in and multi-modal access to 2040 Target Areas and ensure that development in 2040 Target Areas is consistent with and supports the transportation investments.
- **Objective 1.2 Parking Management** – Minimize the amount and promote the efficient use of land dedicated to vehicle parking.
- **Objective 1.3 Affordable Housing** – Support the preservation and production of affordable housing in the region.

Goal 2: Sustain Economic Competitiveness and Prosperity

Multi-modal transportation infrastructure and services support the region's well-being and a diverse, innovative, sustainable and growing regional and state economy.

- **Objective 2.1 Reliable and Efficient Travel and Market Area Access** - Provide for reliable and efficient multi-modal regional, interstate and intrastate travel and market area access through a seamless and well-connected system of throughways, arterial streets, freight services, transit services and bicycle and pedestrian facilities.
- **Objective 2.2 Regional Passenger Connectivity** – Ensure reliable and efficient connections between passenger intermodal facilities and destinations in and beyond the region to improve non-auto access to and from the region and promote the region's function as a gateway for tourism.
- **Objective 2.3 Metropolitan Mobility** - Maintain sufficient total person-trip and freight capacity among the various modes operating in the Regional Mobility Corridors to allow reasonable and reliable travel times through those corridors.
- **Objective 2.4 Freight Reliability** –Maintain reasonable and reliable travel times and access through the region, as well as between freight intermodal facilities and destinations within and beyond the region, to promote the region's function as a gateway for commerce.
- **Objective 2.5 – Job Retention and Creation** – Attract new businesses and family-wage jobs and retain those that are already located in the region.

Goal 3: Expand Transportation Choices

Multi-modal transportation infrastructure and services provide all residents of the region with affordable and equitable options for accessing housing, jobs, services, shopping, educational, cultural and recreational opportunities, and facilitate competitive choices for goods movement for all businesses in the region.

- **Objective 3.1 Travel Choices** - Achieve modal targets for increased walking, bicycling, use of transit and shared ride and reduced reliance on the automobile and drive alone trips.
- **Objective 3.2 Vehicle Miles of Travel** - Reduce vehicle miles traveled per capita.
- **Objective 3.3 Equitable Access and Barrier Free Transportation** - Provide affordable and equitable access to travel choices and serve the needs of all people and businesses, including people with low income, children, elders and people with disabilities, to connect with jobs, education, services, recreation, social and cultural activities.
- **Objective 3.4 Shipping Choices** – Support multi-modal freight transportation system that includes air cargo, pipeline, trucking, rail, and marine services to facilitate competitive choices for goods movement for businesses in the region.

Goal 4: Emphasize Effective and Efficient Management of the Transportation System

Existing and future multi-modal transportation infrastructure and services are well-managed to optimize capacity, improve travel conditions and address air quality goals.

- **Objective 4.1 Traffic Management –** Apply technology solutions to actively manage the transportation system.
- **Objective 4.2 Traveler Information –** Provide comprehensive real-time traveler information to people and businesses in the region.
- **Objective 4.3 Incident Management –** Improve traffic incident detection and clearance times on the region's transit, arterial and throughways networks.
- **Objective 4.4 Demand Management –** Implement services, incentives and supportive infrastructure to increase telecommuting, walking, biking, taking transit, and carpooling, and shift travel to off-peak periods.
- **Objective 4.5 Value Pricing –** Consider a wide range of value pricing strategies and techniques as a management tool, including but not limited to parking management to encourage walking, biking and transit ridership and selectively promote short-term and long-term strategies as appropriate.

Goal 5: Enhance Safety and Security

Multi-modal transportation infrastructure and services are safe and secure for the public and goods movement.

- **Objective 5.1 Operational and Public Safety** - Reduce fatal and severe injuries and crashes for all modes of travel.
- **Objective 5.2 Crime -** Reduce vulnerability of the public, goods movement and critical transportation infrastructure to crime.
- **Objective 5.3 Terrorism, Natural Disasters and Hazardous Material Incidents** - Reduce vulnerability of the public, goods movement and critical transportation infrastructure to acts of terrorism, natural disasters, hazardous material spills or other hazardous incidents.

Goal 6: Promote Environmental Stewardship

Promote responsible stewardship of the region's natural, community, and cultural resources.

- **Objective 6.1 Natural Environment** – Avoid or minimize undesirable impacts on fish and wildlife habitat conservation areas, wildlife corridors, significant flora and open spaces.
- **Objective 6.2 Clean Air** – Reduce transportation-related vehicle emissions to improve air quality so that as growth occurs, the view of the Cascades and the Coast Range from within the region are maintained.
- **Objective 6.3 Water Quality and Quantity** – Protect the region's water quality and natural stream flows.
- **Objective 6.4 Energy and Land Consumption** - Reduce transportation-related energy and land consumption and the region's dependence on unstable energy sources.
- **Objective 6.5 Climate Change** – Reduce transportation-related greenhouse gas emissions.

Goal 7: Enhance Human Health

Multi-modal transportation infrastructure and services provide safe, comfortable and convenient options that support active living and physical activity, and minimize transportation-related pollution that negatively impacts human health.

- **Objective 7.1 Active Living** – Provide safe, comfortable and convenient transportation options that support active living and physical activity to meet daily needs and access services.
- **Objective 7.2 Pollution Impacts** – Minimize noise, impervious surface and other transportation-related pollution impacts on residents in the region to reduce negative health effects.

Goal 8: Ensure Equity

The benefits and adverse impacts of regional transportation planning, programs and investment decisions are equitably distributed among population demographics and geography, considering different parts of the region and census block groups with different incomes, races and ethnicities.

- **Objective 8.1 Environmental Justice** – Ensure benefits and impacts of investments are equitably distributed by population demographics and geography.
- **Objective 8.2 Coordinated Human Services Transportation Needs** - Ensure investments in the transportation system provide a full range of affordable options for people with low income, elders and people with disabilities consistent with the Tri-County Coordinated Human Services Transportation Plan (CHSTP).
- **Objective 8.3 Housing Diversity** - Use transportation investments to achieve greater diversity of housing opportunities by linking investments to measures taken by the local governments to increase housing diversity.
- **Objective 8.4 Transportation and Housing Costs**– Reduce the share of households in the region spending more than 50 percent of household income on housing and transportation combined.

Goal 9: Ensure Fiscal Stewardship

Regional transportation planning and investment decisions ensure the best return on public investments in infrastructure and programs and are guided by data and analyses.

- **Objective 9.1 Asset Management–** Adequately update, repair and maintain transportation facilities and services to preserve their function, maintain their useful life and eliminate maintenance backlogs.
- **Objective 9.2 Maximize Return on Public Investment** - Make transportation investment decisions that use public resources effectively and efficiently, using a performance-based planning approach supported by data and analyses that include all transportation modes.
- **Objective 9.3 Stable and Innovative Funding –** Stabilize existing transportation revenue while securing new and innovative long-term sources of funding adequate to build, operate and maintain the regional transportation system for all modes of travel at the federal, state, regional and local level.

Goal 10: Deliver Accountability

The region's government, business, institutional and community leaders work together in an open and transparent manner so the public has meaningful opportunities for input on transportation decisions and experiences an integrated, comprehensive system of transportation facilities and services that bridge governance, institutional and fiscal barriers.

- **Objective 10.1 Meaningful Input Opportunities -** Provide meaningful input opportunities for interested and affected stakeholders, including people who have traditionally been underrepresented, resource agencies, business, institutional and community stakeholders, and local, regional and state jurisdictions that own and operate the region's transportation system in plan development and review.
- **Objective 10.2 Coordination and Cooperation** - Ensure representation in regional transportation decision-making is equitable from among all affected jurisdictions and stakeholders and improve coordination and cooperation among the public and private owners and operators of the region's transportation system so the system can function in a coordinated manner and better provide for state and regional transportation needs.

2.3.1 Performance targets

While goals and objectives are a vital component of the plan, equally important are quantifiable performance targets to track the region's progress. Investments that achieve performance targets are critical for the region to be successful in realizing a truly integrated, multi-modal transportation system that achieves the goals and objectives of the RTP.

Continuing the practice established with the RTP adopted in 2010, this plan includes transportation performance targets, listed in **Table 2.3,** that support the outcomes-based framework and the plan's goals and objectives. The performance targets provided policy direction for developing the investment strategy recommended in Chapter 3 and for updating local transportation system plans. **Table 2.3** includes findings on how well the RTP performs in relation to the targets. The supporting data is found in the Appendix.

Table 2.3
Regional Transportation Performance Targets[4]

Target	Performance	Finding
ECONOMY		
Safety –By 2040, reduce the number of fatal and severe injury crashes for pedestrians, bicyclists, and motor vehicle occupants each by 50% compared to 2007 - 2011 average.	Between 2007 - 2011: There were an annual average of: 63 fatal or severe injury pedestrian crashes 35 fatal or severe bike crashes 398 fatal or severe injury motor vehicle only crashes	Reducing the number of fatal and severe injury crashes by half would result in at least 248 fewer people killed or severely injured, on average, in crashes in the Metro region each year. The corresponding reduced societal cost of crashes would be approximately $480 Million (2012 dollars) annually in the Metro region.
Congestion – By 2040, reduce vehicle hours of delay (VHD) per person by 10 percent compared to 2010.	By 2040: VHD per person increases by 112% in 2 hour pm peak travel period VHD per person increases by 153% in the 1 hour mid-day travel period	The region does not meet the target. The data shows that VHD per person increases significantly from 2010.
Freight reliability – By 2040, reduce vehicle hours of delay per truck trip by 10 percent compared to 2010.	By 2040: VHD per truck trip increases by 59% in 2 hour pm peak travel period VHD per truck trip increases by	The region does not meet the target. The data shows that VHD for truck trips increases moderately in the pm peak and significantly in the mid-hour travel period.

[4] All 2010 and 2040 modeled outputs in Table 2.3 are based on intra-UGB travel.

Target	Performance	Finding
	89% in the 1 hour mid-day travel period	
ENVIRONMENT		
Climate change – By 2040, reduce transportation-related greenhouse gas emissions per capita below 2010 levels.	By 2040: Carbon dioxide emissions increase by 10% above 2010 levels.	The data shows that carbon dioxide increases slightly from 2010 based on the planned level and mix of investments.
Active transportation – By 2040, triple walking, biking and transit mode shares compared to 2010 modeled mode shares.	By 2040: Transit mode share increases to 7.8% compared to the target share of 13% Walking increases to 10.1% compared to the target share of 27% Biking increases to 3.8% compared to the target share of 11.1%.	Data shows that the region is making progress toward achieving the target.
Basic infrastructure – By 2040, increase by 50% the miles of sidewalk, bikeways, and trails compared to the regional networks in 2010.	Miles of regional trails increase by 61% (from 229[5] to 369 miles) Miles of regional bikeways increase by 68% (from 623 to 1044 miles)	The region meets the performance target for adding trails and bikeways. Data under development for miles of sidewalks added through RTP projects by 2040. As of 2010, 55% of regional pedestrian network has sidewalks on both sides of street. 209 additional miles of sidewalks are needed by 2040 to meet the target.
Clean air – By 2040, ensure zero percent population exposure to at-risk levels of air pollution.	In 2040: Carbon monoxide is estimated at 290,876 lbs/day, 75% below the regional motor vehicle emissions budget for 2040	The region meets the target for carbon monoxide exposure from transportation sources.
Travel – By 2040, reduce vehicle miles traveled per person by 10 percent	In 2010: Vehicle miles traveled per person decline 6.4% below	The region does not meet the target. However, the data shows that the region is

[5] There are 229 miles of trails in 2010 in the RTP trail network. This does not include mileage of trails not defined as part of the regional transportation system.

Target	Performance	Finding
compared to 2010.	2010 levels.	making progress toward achieving the target.
EQUITY		
Affordability – By 2040, reduce the average household combined cost of housing and transportation by 25 percent compared to 2010.	In 2010, the average household in the Portland region spent about 43.9 percent of its income on housing and transportation. In 2040 it is estimated that the average household in the region will spend about 51% on housing and transportation.	The region does not meet the target. However, the cost of transportation as a percentage of total household income holds steady from 2010 (13.7%) to 2040 (13.6%).
Access to daily needs – By 2040, increase by 50 percent the number of essential destinations accessible within 30 minutes by bicycling and public transit for low-income, minority, senior and disabled populations compared to 2005.	Data under development	The methodology for establishing a base line for this target is being developed.

The performance targets are numerical benchmarks to assess the region's progress in carrying out the RTP vision. These targets draw from federal and state legislation. They are aspirational and begin moving the region towards outcome-based decision making. It is expected that as evaluation methods and tools are enhanced the targets will be further refined during subsequent RTP updates.

2.3.2 Performance Standards

The RTP must demonstrate that it defines an adequate transportation system to serve planned land uses to meet state planning requirements. The targets in the previous section, the interim standards in this section and performance measures described in Chapter 4 will serve as the basis for determining whether the proposed transportation system adequately addresses the ten RTP goals and planned land uses during the plan period.[5]

Interim Regional Mobility Policy

The interim mobility policy shown in **Table 2.4** describes operational conditions that are used to evaluate the quality of service of the auto network, using the ratio of traffic volume to planned capacity (referred to as the volume/capacity ratio) of a given roadway. The measures are used to diagnose the extent of auto congestion during different times of the day in order to identify deficient roadway facilities and services in the plan. The interim regional mobility policy in **Table 2.4** shows the minimum performance level desired for auto transportation facilities and services within the region. Originally adopted in 2000 and amended into the Oregon Highway Plan in 2002, the interim regional mobility policy reflects a level of performance in the region that the Oregon Transportation Commission (OTC) deemed tolerable at the time of its adoption, but is also recognized as an incremental step toward a more comprehensive set of measures that consider system performance, as well as financial, environmental and community impacts.

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

This evaluation helps the region develop strategies to address roadway congestion in a more strategic manner, given limited transportation funding and potential environmental and community impacts. The system analysis described in Chapter 4 finds that the region cannot achieve the mobility policy listed in **Table 2.4** within current funding levels or with the mix of investments included in the analysis.

[5] The Oregon Transportation Planning Rule, subsection 0060, requires the RTP to include performance measures that ensure the transportation system is adequate to serve planned land uses.

Table 2.4
Interim Regional Mobility Policy
Deficiency Thresholds and Operating Standards

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

A. The demand-to-capacity ratios in the table are for the highest two consecutive hours of weekday traffic volumes. The mid-day peak hour is the highest 60-minute period between the hours of 9 a.m. and 3 p.m. The 2nd hour is defined as the single 60-minute period, either before or after the peak 60-minute period, whichever is highest.

B. A corridor refinement plan is required in Chapter 5 of the RTP, and will include a recommended mobility policy for each corridor.

Regional Modal Targets

Non-drive alone modal targets established in **Table 2.5** are intended to be goals for cities and counties to work toward as they implement the 2040 Growth Concept at the local level. Increases in walking, bicycling, ridesharing and transit mode shares will be used to demonstrate compliance with per capita travel reductions required by the state Transportation Planning Rule. The most urbanized areas of the region will achieve higher non-drive alone modal shares than less developed areas closer to the urban growth boundary.

Table 2.5
Regional Modal Targets

2040 Design Type	Non-drive alone modal target
Portland central city	60-70%
Regional centers Town centers Main streets Station communities Corridors Passenger intermodal facilities	45-55%
Industrial areas Freight intermodal facilities Employment areas Inner neighborhoods Outer neighborhoods	40-45%

Note: *The targets apply to trips to and within each 2040 design type. The targets reflect conditions needed in the year 2040 to comply with Oregon Transportation Planning Rule objectives to reduce reliance on single-occupancy vehicles.*

2.4 REGIONAL SYSTEM DEFINITION

Multi-modal regional 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 Portland metropolitan region, including connecting the region to other parts of the state and Pacific Northwest or provides access to and within 2040 Target 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. These facilities are shown on the network maps in this chapter.

Regional Transportation System Components

Regional multi-modal transportation facilities and services include the following components:

1. Regional System Design
2. Regional Arterial and Throughway Network, which includes the National Highway System (NHS) and State highways
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

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

1. All state transportation facilities (including interstate, statewide, regional and district highways and their bridges, overcrossings and ramps).
2. All arterial facilities and their bridges.
3. Transportation facilities, including bicycle and pedestrian facilities, within designated 2040 centers, corridors, industrial areas, employment areas, main streets and station communities.
4. All high capacity transit and regional transit networks and their bridges.
5. All regional bicycle and pedestrian facilities and their bridges, including regional trails shown on the regional pedestrian and bicycle networks.
6. All bridges that cross the Willamette, Columbia, Clackamas, Tualatin or Sandy rivers.
7. All freight and passenger intermodal facilities, airports, rail facilities and marine transportation facilities and their bridges.

8. Any other transportation facility, service or strategy that is determined by JPACT and the Metro Council to be of regional interest because it has a regional need or impact (e.g. transit-oriented development, transportation system management and demand management strategies, local street connectivity, and culverts that serve as barriers to fish passage).

Together, these facilities and services constitute an integrated and interconnected system that supports desired land use and provides transportation options to achieve the goals of the RTP.

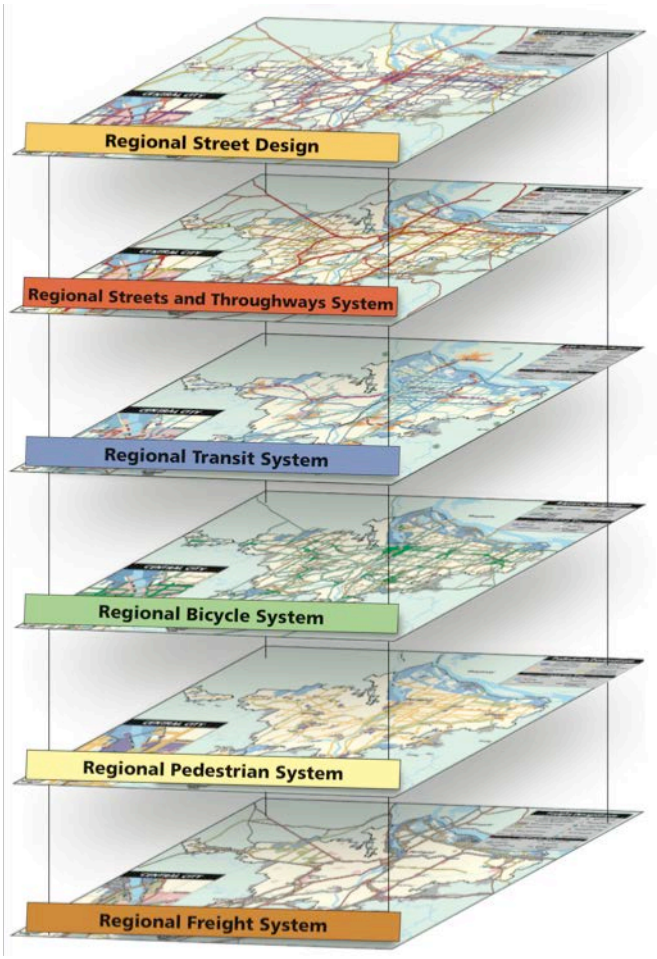
Visions, concepts and supporting policies are described for each component in the next section.

2.5 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 for travel through a seamless and well-connected system of regional throughways and streets, local streets, freight networks, transit services and bicycle and pedestrian facilities. The concepts and policies emphasize safety, access, mobility and reliability for people and goods and the community-building and placemaking role of transportation.

The network visions, concepts and policies guide the development, design and management of different components of the regional transportation system.



Regional Transportation Network Components

2.5.1 Regional System Design and Placemaking Concept

Regional system design concepts address federal, state and regional transportation planning mandates with design concepts intended that support regional and local implementation of the 2040 Growth Concept. This concept establishes guidelines for the physical design of the regional transportation system to foster livable communities throughout the region and encourage walking, bicycling and use of transit.

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 design concepts reflect that streets perform many, often conflicting functions. Conflicts among travel modes need to be reconciled for the safety of all modes of travel. The design concepts promote community livability and mobility by balancing all modes of travel and addressing the function and character of surrounding 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 walking, bicycling, carpooling, vanpooling and use of transit.

Metro's Livable Streets Handbooks, shown in **Figure 2.4**, provide the designs and vary depending on intended function of the street or throughway and the land uses the facility serves. Consideration is given to various arterial designs, designs for pedestrians, bicyclists and transit and the link between street design and stormwater management. Metro plans to update the handbooks in 2014-15 to better address design for freight and provide more detail on the pedestrian, bicycle and trail design guidance identified in the Regional Active Transportation Plan. The update will include design guidance for interaction of freight, pedestrians and bicycles; bicycle and transit interaction; and regional bikeway and trail design. A new handbook on wildlife crossings was developed and is available from Metro's website.

Figure 2.4
Metro's Livable Streets Handbooks

Table 2.6 summarizes throughway and arterial classifications, design elements and recommended functions, illustrating how multi-modal design elements can be integrated. The idealized cross sections in the table are illustrative only. **Figure 2.5** applies the design concepts to the regional arterial and throughway network. (See http://gis.oregonmetro.gov/RTP/ for zoomable version of map.)

Regional Design Classifications

Figure 2.5

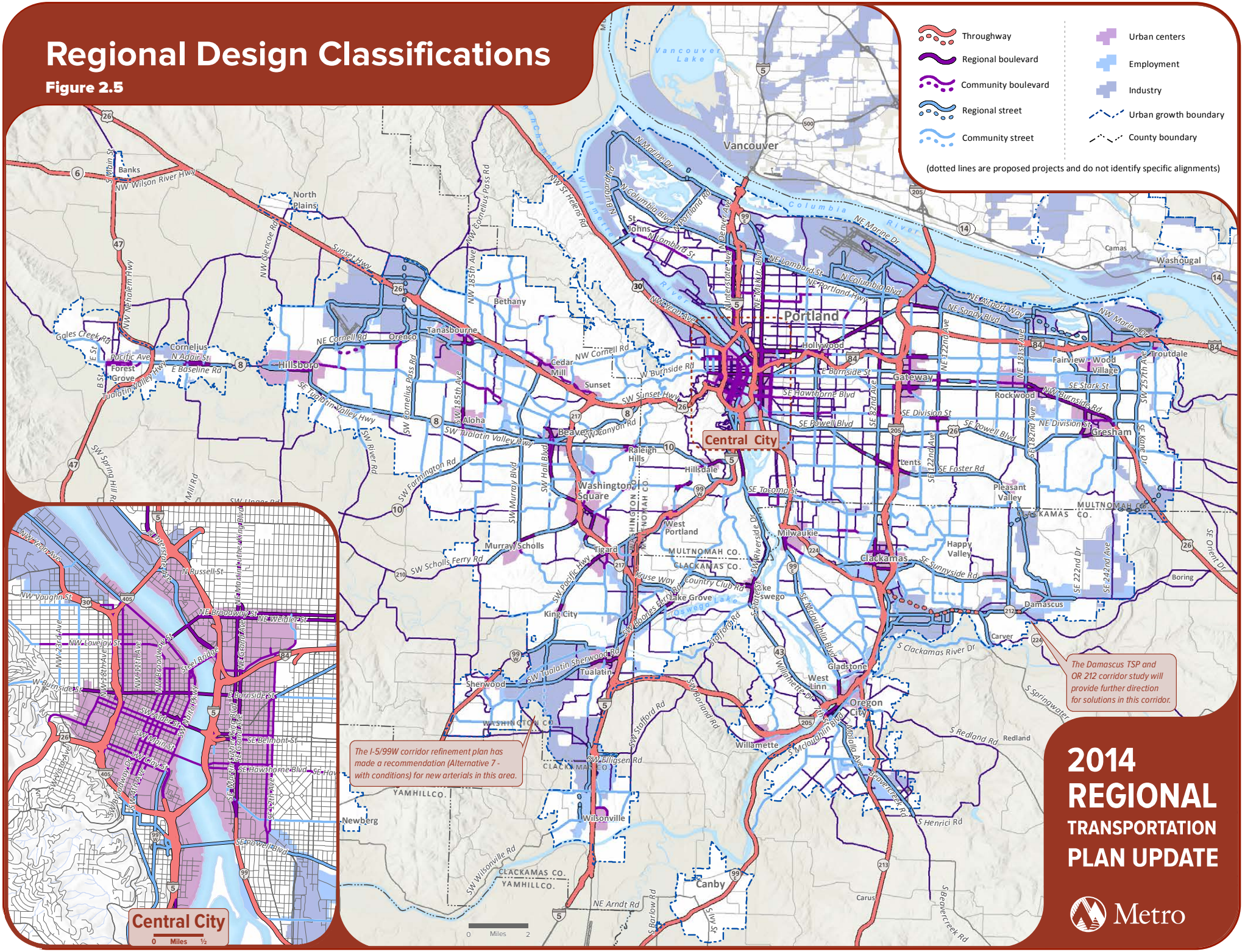
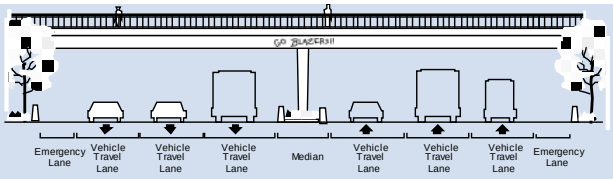
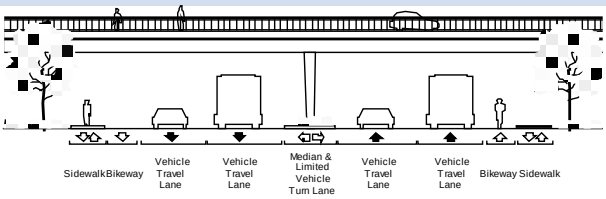
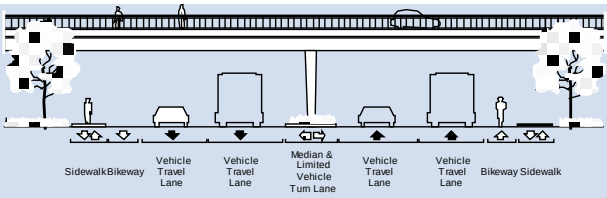
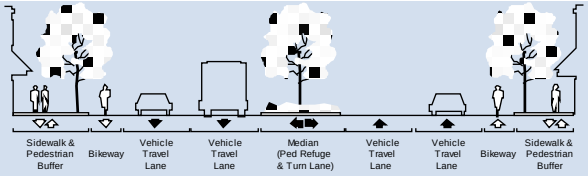
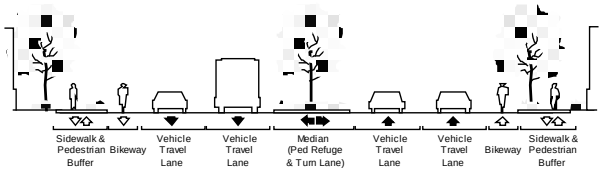
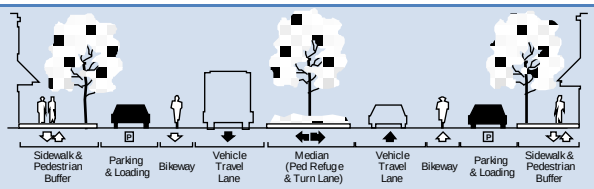
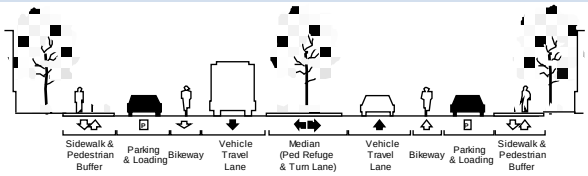


Table 2.6
Arterial and Throughway Design Concepts

Trip Type	2040 Design Concept	Network Function	Illustrative Design Concept	Typical number of planned travel lanes[6]
			THROUGHWAYS	
Interstate/ regional	Throughway (Freeway)	Principal arterial		6 through lanes (plus auxiliary lanes) with grade separated interchanges
Interstate/ regional	Throughway (Highway)	Principal arterial		6 through lanes (plus auxiliary lanes) with grade separated intersections/ interchanges
Interstate/ regional	Throughway (Parkway)	Principal arterial		6 through lanes (plus auxiliary lanes) with grade separated intersections/ interchanges
			ARTERIAL STREETS	
Regional / City	Regional Boulevard *2040 centers* *Station communities* *Main streets*	Major Arterial		Up to 4 through lanes with turn lanes
Regional / City	Regional Street *Industrial areas* *Employment areas* *Corridors* *Intermodal facilities*	Major Arterial		Up to 4 through lanes with turn lanes

[6] 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 connectivity. Major and minor arterial streets can either be 2 or 4 lanes with turn lanes as appropriate.

City	Community Boulevard *2040 centers* *Station communities* *Main streets*	Minor Arterial		2 to 4 through lanes with turn lanes
City	Community Street *Industrial areas* *Employment areas* *Corridors* *Intermodal facilities*	Minor Arterial		2 to 4 through lanes with turn lanes

Source: Metro

Designs for pedestrians, bicyclists and transit users

Street and facility designs have a significant impact on people's ability to walk, bike and access transit comfortably, safely and easily. Sidewalks, trails and bikeways provide transportation options and encourage walking and bicycling. Where appropriate, traffic calming measures such as narrower travel lanes, compact intersections, landscaped buffers and on-street parking can slow vehicle traffic and reduce traffic accidents for 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

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.

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.

Designs for stormwater management and natural resource protection

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

Impervious surfaces have been linked to changes in the shape of streams, water quality, water temperature and the biological health of waterways. Regional Green Streets guidelines seek to mitigate these effects through a combination of retrofits to existing streets and designs for new streets and throughways.

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

As arterial streets and throughways and other types of transportation infrastructure cut across the landscape, they form barriers to wildlife movement, disrupting migration patterns and population dynamics. These disruptions can be minimized through engineered solutions, such as wildlife-crossing devices, structures and through incorporating wildlife corridor acquisition/restoration needs into transportation project development or by avoiding the areas all together.

Infrastructure planning and design should first seek to avoid fish and wildlife habitat conservation areas. If that is not practicable, opportunities to mitigate the effects of transportation infrastructure and services through the application of "green" design treatments should be indentified and implemented. For example, street trees, vegetated swales and other green street treatments can intercept rainwater and convey stormwater in the public right-of-way adjacent to the region's throughways and arterial streets and pedestrian and bicycle projects can include improved crossings for wildlife. Refer to Metro's handbooks "Green Streets: Innovative

Solutions for Stormwater and Stream Crossings" and "Wildlife Crossings: Providing safe passage for urban wildlife" for more information on these designs.

2.5.2 Arterial and Throughway Network Vision

Though our region has changed dramatically over the past century, the shape of the major street 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 arterial and throughway 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.

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

Arterial and Throughway Network Concept

The regional arterial and throughway network concept contains policy and strategy provisions to develop a complete and well-connected roadway network that provides adequate capacity and supports all modes of travel.

Rather than relying on levels of congestion to direct how and where to address motor vehicle capacity needs, the concept calls for implementing a well-connected network design that is tailored to fit local geography, respect existing communities and future development and protect the natural environment.

Three policies form the foundation of this vision:

1. **Build a well-connected network of complete streets that prioritize safe and convenient pedestrian and bicycle access**
2. **Improve local and collector street connectivity**
3. **Maximize system operations by implementing management strategies prior to building new motor vehicle capacity, where appropriate**

Arterial and Throughway Policy 1. Build a well-connected network of complete streets that prioritize pedestrian and bicycle access

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

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.

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 arterial and throughway 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. As a result, the regional arterial and throughway 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.

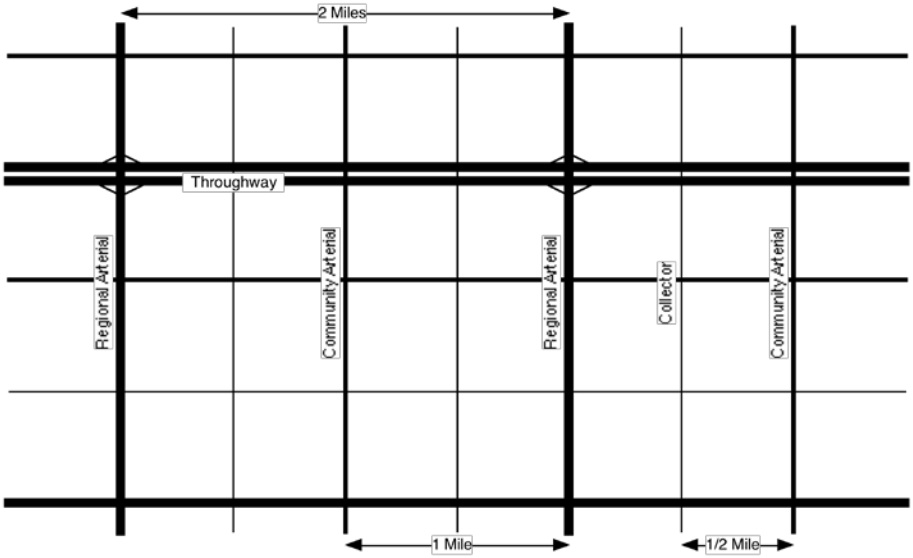
Shown in **Figure 2.6**, the illustrative arterial street network is complemented by a well-connected network of collector and local streets. This network of regional and local streets is multi-modal in design, serving automobiles, motorcycles, trucks, transit, bicycles and pedestrians. The regional arterial street design with median reflects an accepted compromise for all of these modes, accommodating urban levels of traffic, while also allowing for bicycle and pedestrian travel and 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 design guidance, 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. 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.

Figure 2.6

Regional Arterial and Throughway Network Concept

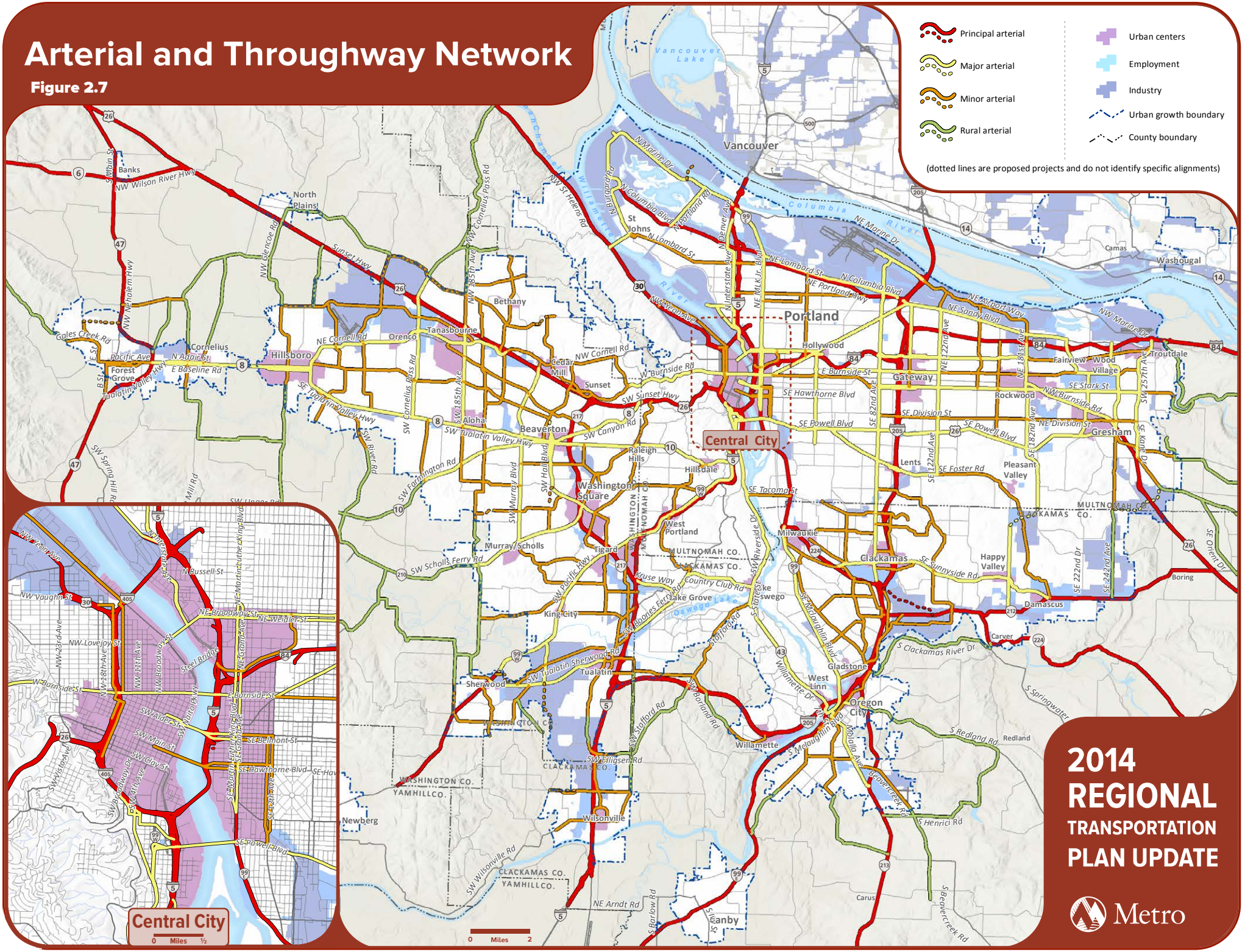


Note: Conceptual model, illustrating multi-modal transportation corridors and showing ideal spacing of arterial streets. Most of the region's travel occurs off the throughway network, on a network of multi-modal arterial streets. The RTP policy places a new emphasis on ensuring that arterial networks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

The Regional Arterial and Throughway Network is shown in **Figure 2.7**. (See http://gis.oregonmetro.gov/RTP/ for zoomable version of map.

Arterial and Throughway Network

Figure 2.7



2014 REGIONAL TRANSPORTATION PLAN UPDATE

Metro

Throughways

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

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

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

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

Arterial streets

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

Arterial streets usually carry between 10,000 and 40,000 vehicles per day and often allow higher speeds than collector and local streets. Major arterial streets accommodate longer-distance through trips and serve more of a regional traffic function. Minor arterial streets serve shorter trips that are localized within a community. As a result, major arterial streets usually carry more traffic than minor arterial streets. The arterial functional classification is implemented through the Boulevard and Street design classifications described in **Table 2.6** and in the glossary.

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

Safety is a primary concern on the regional arterial system, on which approximately 60% of the region's fatal and severe injury crashes occur. More attention to safe design and operation 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, and may include:

- proven design strategies such as medians, speed management, access management, improved pedestrian crossings, roundabouts, 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 pedestrian crossings; and
- education initiatives intended to promote safer behavior among all users of the 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.

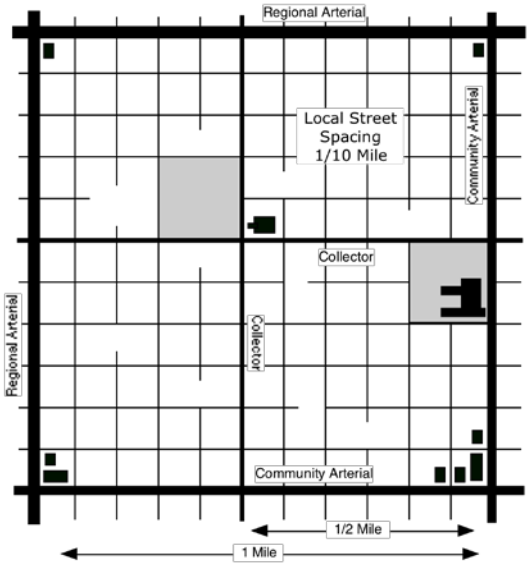
Arterial and Throughway Policy 2. Improve local and collector street connectivity

Collector and local streets are general access facilities that provide for community and neighborhood circulation. They are not usually part of the regional transportation system except when located within designated 2040 areas as described in Section 2.4 (or when they are part of the Regional Bicycle or Pedestrian Network), they play an important supporting role to the design and optimization of the regional transportation system. When local travel is restricted by a lack of connecting routes, local trips are forced onto the arterial and/or throughway networks, in some cases causing congestion on the regional system.

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

A goal of the requirements is to encourage local traffic to use local and collector streets to minimize local traffic on regional arterial streets. Local street connectivity also benefits emergency response. Designs should retain the neighborhood character and livability along these local routes. Shown in **Figure 2.8**, 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.

Figure 2.8
Collector and Local Streets Network Concept



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

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

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

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.

Arterial and Throughway Policy 3. Maximize system operations by implementing management strategies prior to building new motor vehicle capacity, where appropriate

The RTP calls for maximizing system operations by implementing management strategies prior to building new motor vehicle capacity, consistent with the Federal Congestion Management Process (CMP) and Oregon Transportation Plan policies. In some parts of the Portland metropolitan 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. More information on management strategies can be found at Section 2.5.6.

2.5.3 REGIONAL TRANSIT NETWORK VISION

Transit is required to implement the 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 help the region:

- be less dependent on automobiles
- reduce overall transportation and housing costs
- lead healthier lives
- reduce greenhouse gas emissions

TriMet implements the majority of the transit service component of the RTP in what is called the Transit Investment Plan (TIP). The SMART district and other transit providers complement TriMet's service.

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 metropolitan region. The South Metro Area Rapid Transit (SMART) district in Wilsonville also provides regional transit service, connecting Wilsonville to downtown Portland. Just outside of the Metro region, Sandy Area Metro and Canby Area Transit provide transit service for Sandy and Canby. Bus service in other surrounding areas, all with connections to TriMet, is also provided by C-TRAN (Clark County, WA), Cherriots (Salem, OR), Tillamook County Transportation District (Tillamook, OR), and Yamhill County Transit Area (Yamhill County, OR).

Six policies form the foundation of this vision:

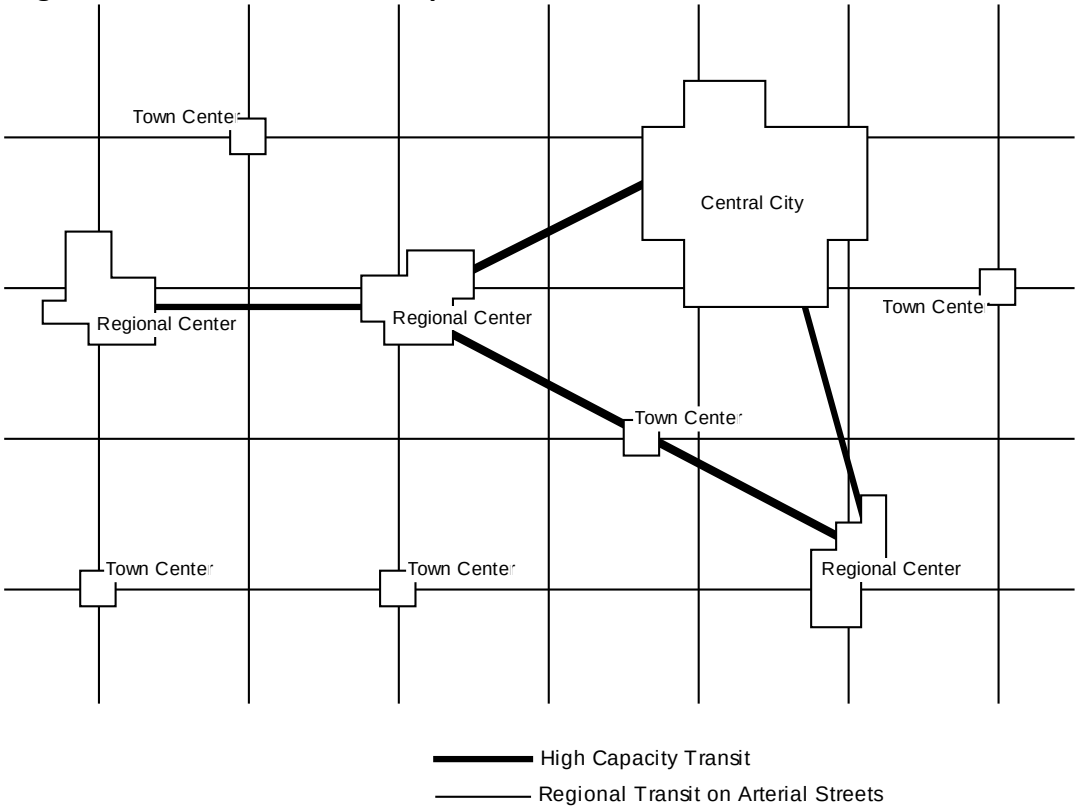
1. **Build the total network and transit-supportive land uses to leverage investments**
2. **Expand high capacity transit**
3. **Expand regional and local frequent service transit**
4. **Improve local service transit**

5. Support expanded commuter rail and intercity transit service to neighboring communities

6. Improve pedestrian and bicycle access to transit

TriMet's Transit Investment Priorities (TIP) and SMART's Master Plan are informed by these policies which aim to provide transit as an attractive and accessible travel option for all people in the Metro region, optimize existing transit system operations and ensure transit-supportive land uses are implemented to leverage the region's current and future transit investments. **Figure 2.9** shows how the regional transit system concept would connect the 2040 centers.

Figure 2.9
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 suburban communities. Existing land use mixes and future transit-oriented development potential should be considered and incorporated into service and station location decisions.

The Regional Transit Network is shown in **Figure 2.10**. (See http://gis.oregonmetro.gov/RTP/ for zoomable version.

Trimet Service Enhancement Plans

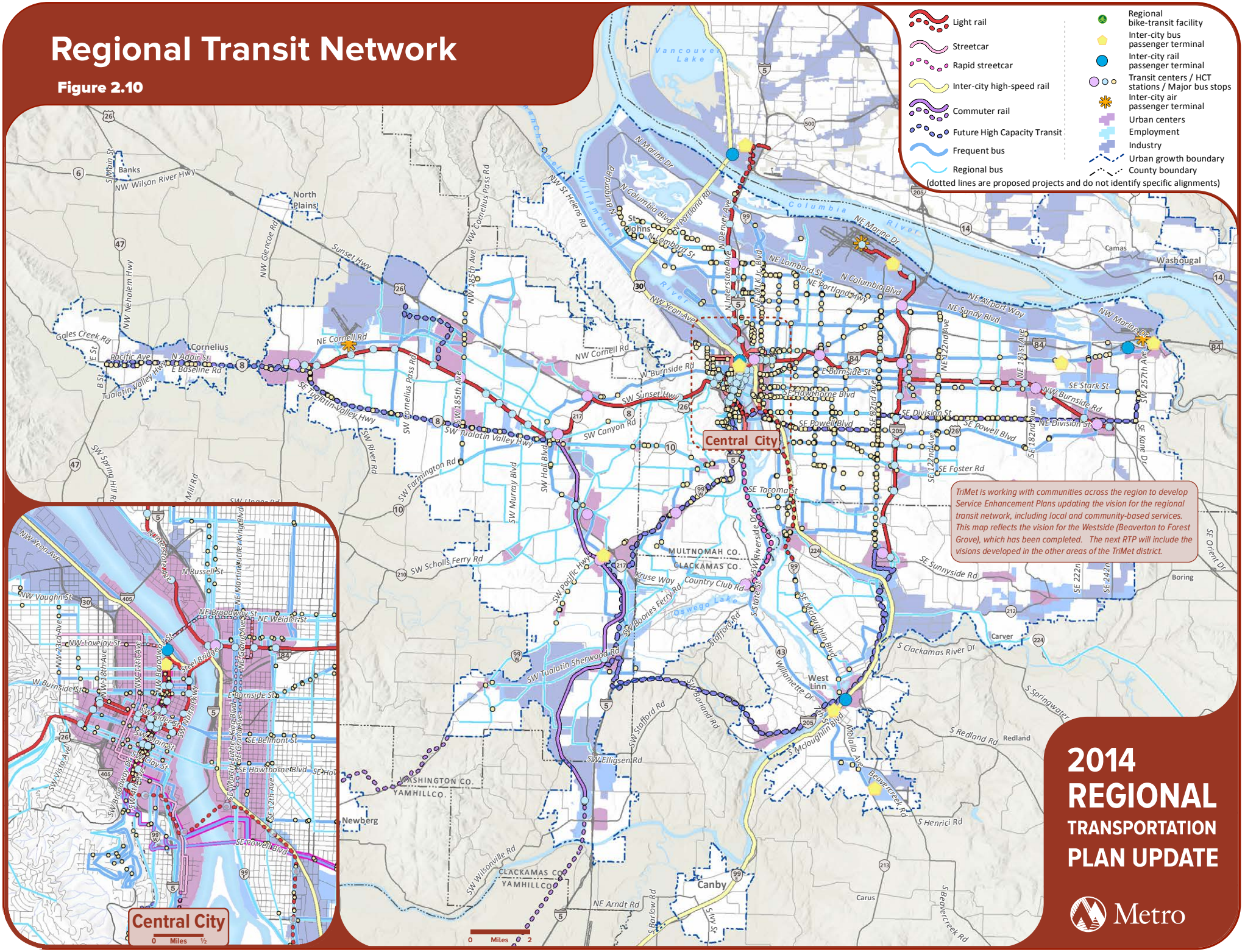
Figure 2.10 includes a note referencing the Service Enhancement Plans that TriMet is developing across the region. The Service Enhancement Planning process is a community-based process to help shape a shared vision for the future of transit in our region. These intensive community engagement efforts are taking place in every community TriMet serves as a way of identifying stakeholder needs on the ground now and in the future and to propose how to restructure current service and design new service to meet those needs.

The visions that come out of the Service Enhancement Planning process will guide how TriMet provides transit service in the future and are the basis for the improved transit service envisioned in the Climate Smart Communities Scenarios project.
Starting in 2012, the first in a series of these planning efforts focused on Beaverton, Hillsboro, Cornelius, Forest Grove and Washington County, including Aloha/Reedville, Bethany, Rock Creek, Cedar Mill and Cedar Hills. This Westside Service Enhancement Planning process has resulted in a new service vision that will inform the TIP process. The Westside Service Enhancement vision identifies areas for future service and opportunities to partner with jurisdictions and the private sector for access to transit improvements including biking and walking to bus lines and MAX. The result was a vision of almost doubling of service currently provided in the area. It will take years to implement this, as resources are available, but this gives a clear guide for how to improve service each year through the TIP process. These visions are consistent with the five policies guiding the Regional Transit Network vision and draw upon the full range of transit service types (high capacity transit, frequent regional and local service), while relying upon transit-supportive land use, and safe and attractive access to transit to build the total transit system.

In 2013-2014, TriMet is focusing on the Eastside, including East Portland and cities of East Multnomah County, as well as the Southwest, including Southwest Portland and the cities of Tigard, Tualatin, Sherwood, King City, Durham, Lake Oswego and West Linn. In 2014, TriMet will begin the process for the Southeast part of the TriMet district, including the service plan for the Portland-Milwaukie Light Rail Project opening, followed by Central and North Portland. While the Service Enhancement Planning process will continue for the next 12-18 months to develop visions for every part of the region, what TriMet has already learned is reflected in what has been proposed for transit service growth in Scenario C and will continue to be updated as these shared visions are developed.

Regional Transit Network

Figure 2.10



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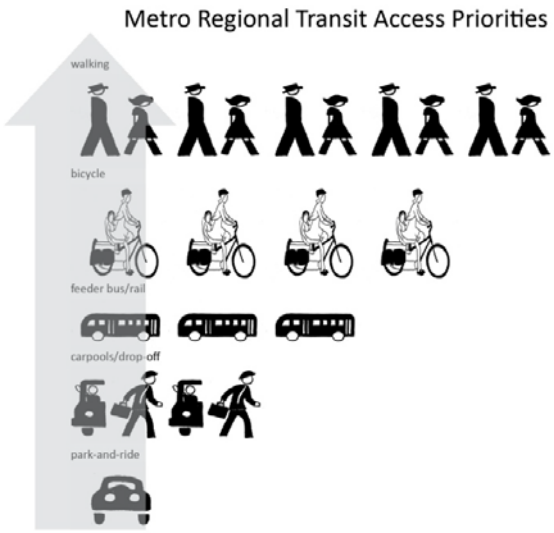
Transit Policy 1. Build the total transit network and transit-supportive land uses to leverage investments

Building the total transit network is based on providing frequent, reliable bus and rail service during all times of the day, every day of the week. However, it goes far beyond this, requiring actions on behalf of the region and all jurisdictions, not just the transit agency. 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 and private automobiles.

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 2.11** depicts the Metro region's priorities for providing multi-modal access to the region's transit service. It prioritizes walking and biking to transit and deemphasizes driving to transit.

Figure 2.11
Regional Transit Access Priorities



It is important to invest in making the whole trip more convenient and attractive: clear customer information; easy access to stops (including safe access to stations and secure bicycle parking), comfortable places to wait for transit; and modern, well-maintained vehicles.

It is also important to ensure land uses are transit-supportive 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 and not work are outlined in **Table 2.7**.

Table 2.7
What Works and Doesn't Work to Support Direct Transit Service

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

Source: TriMet

Transit-supportive development patterns include:

- An urban form and densities that generate a high number of transit riders.
- A mix of uses, and a balance of jobs and housing, that creates a place where activity occurs at least 18 hours a day.
- Well-designed streets and buildings that encourage pedestrian movement.
- Streets that can accommodate 40-foot buses.
- Safe, direct and convenient pedestrian and bicycle access, within communities and to transit stops.

Development oriented transit promotes the seamless integration of land use and transit

- Street connectivity with good pedestrian and bike paths to extend the effective coverage of bus and rail service.
- Limited and managed auto 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.

Transit Policy 2. Expand high capacity transit

As part of the RTP update, the region undertook a comprehensive assessment of the existing and potential future high capacity transit network. The results of this effort are captured in the High Capacity Transit (HCT) System Plan and incorporated into this section.

minimizes the need to expand the urban growth boundary and supports the region's efforts to reduce greenhouse gas emissions.

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 the backbone of the transit network connecting 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 day and 15 minutes on weekends.

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[7], civic art and commercial services. Using transit

[7] See section 2.4.2.4 for description of TriMet Bicycle Parking Design Guidelines.

signal priority at at-grade crossings and/or intersections preserves speed and schedule reliability.

In select suburban locations, park-and-ride facilities provide vehicular access to the high capacity transit network. These services require pedestrian and bicycle networks that provides access from adjacent streets and land uses to the regional transit network, especially for areas that cannot be well-served by local transit due to topography, street configuration, or lack of density.

To optimize and leverage transit supportive land uses, the RTP calls for alignments and station locations 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 and prioritized by the System Expansion Policy.

Types of high capacity transit 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 (limited stop, all day bus service with significant portions of the line running in transit-only right-of-way).
- On-Street Bus Rapid Transit (limited stop, all day bus service, mostly operating in mixed traffic with focused transit priority treatments, such as queue jump lanes). Due to its flexibility, On-Street Bus Rapid Transit can have attributes that are more like High Capacity Transit or like Frequent Service Bus and may be considered as a mode in either, depending on circumstances.
- 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)
- Bicycle stations/parking
- Park-and-ride lots
- Transit Centers
- Transit Stations

The RTP calls for HCT alignments and station locations to be oriented towards existing and future high density, mixed-use development.

HCT Plan and Priority Tiers

In June and July 2009, the Joint Policy Advisory Committee on Transportation and the Metro Council adopted the Regional High Capacity Transit (HCT) System Plan. The HCT Plan identifies corridors where new HCT is desired over the next 30 years. It prioritizes corridors for implementation, based on a set of evaluation criteria, and sets a framework to advance future corridors, consistent with the goals of the RTP and the region's 2040 Growth Concept.

The HCT system plan provides the framework for HCT network investments to be implemented as part of a broad corridor strategy that includes supportive land use and transit-oriented development (TOD), comprehensive parking programs, access networks for pedestrians and cyclists, park and rides and feeder bus networks. It identifies near- and long-term regional HCT priorities and creates a System Expansion Policy that will serve as a framework to advance future regional HCT corridors by setting targets and defining regional and local actions. The HCT Plan conducted much of its analysis using light rail as the representative HCT mode, but the corridors could be developed in a number of modes including light rail, bus rapid transit (on-street or exclusive), commuter rail, and rapid streetcar.

As described above, regional HCT system corridors are grouped into one of four priority tiers, along with specific targets and various steps local jurisdictions could follow to advance a project to a higher tier. The four tiers are based on an HCT corridor's readiness and regional capacity to study and implement HCT projects. Tiers would be reassessed as

part of each RTP update or by RTP amendment. These tiers would remain static and contain a similar number of projects over time.

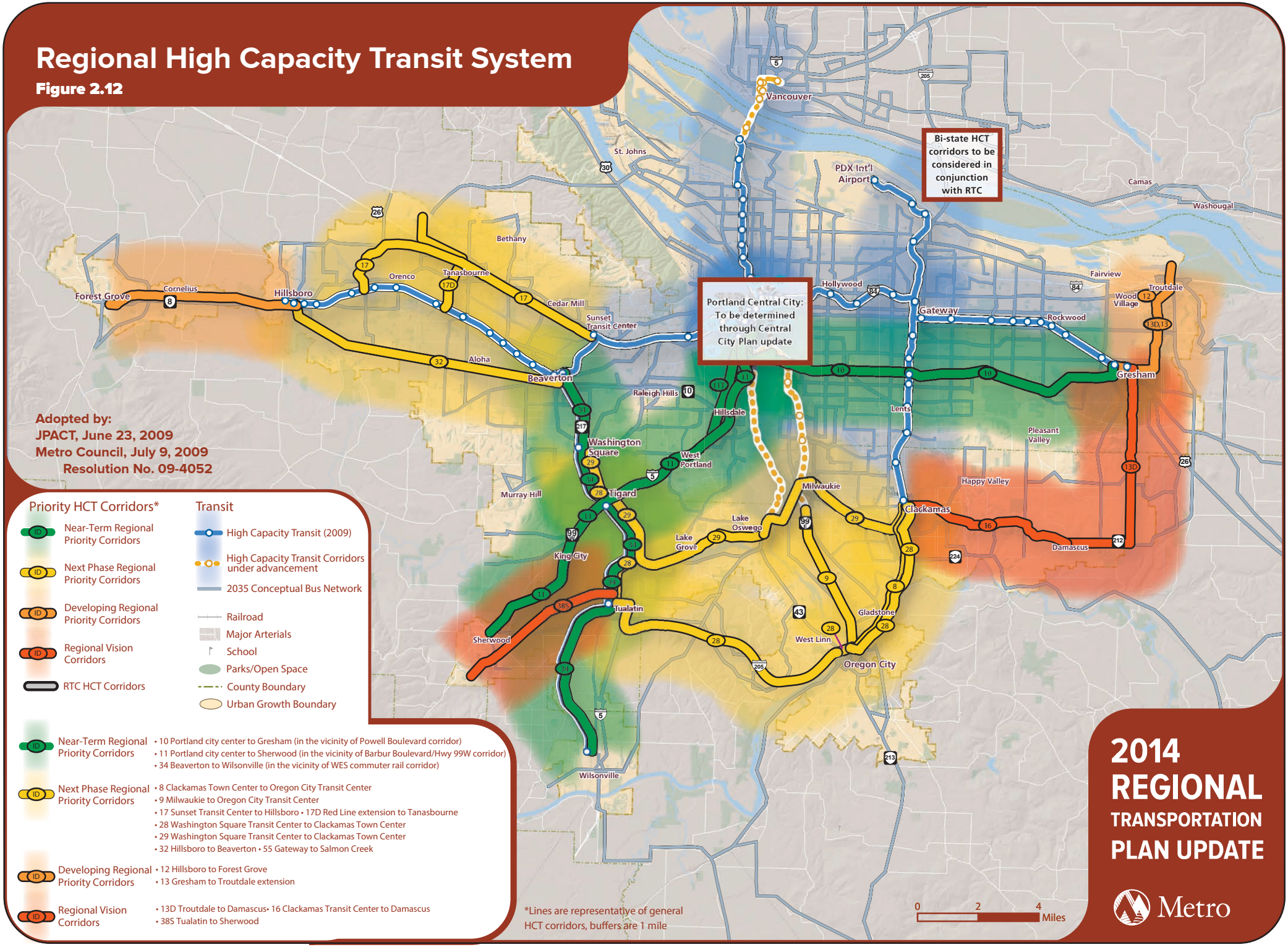
The four tiers are:

- Near-term regional priority corridors: Corridors most viable for implementation in next four years.
- Next phase regional priority corridors: Corridors where future HCT investment may be viable if recommended planning and policy actions are implemented.
- Developing regional priority corridors: Corridors where projected 2035 land use and commensurate ridership potential are not supportive of HCT implementation, but which have long-term potential based on political aspirations to create HCT supportive land uses.
- Regional vision corridors: Corridors where projected 2035 land use and commensurate ridership potential are not supportive of HCT implementation.

The HCT System Plan corridors are shown in **Figure 2.12.**

Regional High Capacity Transit System

Figure 2.12



Adopted by:
JPACT, June 23, 2009
Metro Council, July 9, 2009
Resolution No. 09-4052

Priority HCT Corridors*

- Near-Term Regional Priority Corridors
- Next Phase Regional Priority Corridors
- Developing Regional Priority Corridors
- Regional Vision Corridors
- RTC HCT Corridors

Transit

- High Capacity Transit (2009)
- High Capacity Transit Corridors under advancement
- 2035 Conceptual Bus Network
- Railroad
- Major Arterials
- School
- Parks/Open Space
- County Boundary
- Urban Growth Boundary

Near-Term Regional Priority Corridors
- 10 Portland city center to Gresham (in the vicinity of Powell Boulevard corridor)
- 11 Portland city center to Sherwood (in the vicinity of Barbur Boulevard/Hwy 99W corridor)
- 34 Beaverton to Wilsonville (in the vicinity of WES commuter rail corridor)

Next Phase Regional Priority Corridors
- 8 Clackamas Town Center to Oregon City Transit Center
- 9 Milwaukie to Oregon City Transit Center
- 17 Sunset Transit Center to Hillsboro • 17D Red Line extension to Tanasbourne
- 28 Washington Square Transit Center to Clackamas Town Center
- 29 Washington Square Transit Center to Clackamas Town Center
- 32 Hillsboro to Beaverton • 55 Gateway to Salmon Creek

Developing Regional Priority Corridors
- 12 Hillsboro to Forest Grove
- 13 Gresham to Troutdale extension

Regional Vision Corridors
- 13D Troutdale to Damascus• 16 Clackamas Transit Center to Damascus
- 38S Tualatin to Sherwood

*Lines are representative of general HCT corridors, buffers are 1 mile

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System Expansion

Light rail and other high capacity transit services have become popular in this and other regions over the past two decades. The ability of this region to grow toward the 2040 Growth Concept vision hinges upon the ability to develop and sustain high capacity transit. However, the number of additional high capacity transit corridors that can be implemented in this region are limited by several factors, including, though not limited to:

- Local funding and community support.
- Competition with other regions for scarce federal funding.
- Institutional and financial capacity to develop, build and operate additional high capacity corridors.

Because this region cannot implement all of the desired high capacity corridors in a short time, it is necessary to prioritize which corridors are completed first. To date, this process has hinged on regional decision-making, system needs, financial and political feasibility, and opportunity. The HCT Plan, as a component of the RTP, evaluated potential HCT corridors and ranked them based on a range of measures - many of which ultimately hinge on ridership potential.

The System Expansion Policy (SEP) seeks to extend the work of the HCT Plan and allow for refinement with each RTP update (or through mid-term RTP amendments if needed). The SEP is intended to provide policy direction on the range of factors that should be considered when determining the next high capacity transit corridor to pursue, including:

Pedestrian oriented design and blocks help bring people (density) and activities (diversity) to the transit system

- Community factors that center on local land use aspirations, transit-supportive land uses, building-orientation and block sizes, transportation infrastructure (e.g., sidewalks, bicycle facilities and street connectivity) parking and demand management policies, and design factors that will leverage HCT investments and increase ridership potential within a particular corridor. Generally, these factors are under the control of local governments and are implemented through local land use and transportation plans. If successfully implemented, these factors would bring a given HCT corridor and the communities connected by that corridor closer to the 2040 Growth Concept vision.
- Readiness factors such as political commitment, community support and partnerships needed to pursue the long and sometimes difficult process that even the most popular transportation investments must work through.

- Regional factors such as financial capacity and regional consensus on the appropriate next corridor.

The final decision on which corridor to pursue at any given point must rest on all of the factors. To aid this decision-making, the HCT Plan focuses on the technical factors. It will be updated with each RTP update, though the specific measures and methodologies are expected to evolve over time through a collaborative regional decision-making process. Potential HCT corridors can move closer to implementation, advancing from one tier to the next through a set of coordinated TriMet, Metro, ODOT and local jurisdiction actions that address the remaining factors. HCT corridors will be analyzed for a wide range of performance characteristics, including ridership and potential to compete for funding, before they are designated as the current priority for HCT development.

Chapter 5 of the RTP and the Regional Transportation Functional Plan will include guidance to help local jurisdictions, Metro and TriMet work together to achieve the community, readiness and regional factors listed above. This can include Memorandum of Understandings (MOUs) and eventually Intergovernmental Agreements (IGAs) that harness the synergy between community aspirations, the ability to develop high capacity transit to further those aspirations and other needed local, regional and state actions. It will also include specific targets to measure corridor readiness and contribution to regional goals.

The factors are complex and stem from the interactions of private individuals and businesses, local jurisdictions, and regional agencies. The intention of the guidance is that those jurisdictions which are achieving positive outcomes in these factors and/or have the aspiration to create the most improvement on these factors are simultaneously improving their own communities, creating more transit-friendly environments, and also may be able to pursue a near-term high capacity transit project along with the other jurisdictions in the corridor.

The RTP vision is to complete a network of regional transit along most arterial streets in the region to better serve suburban communities. Allowing mixed-use development and providing sidewalk and bicycle connections to bus stops and transit stations are important local strategies that leverage transit.

Transit Policy 3. Expand regional and local frequent transit service

Frequent service transit has service running every 15 minutes or better from the early morning to late in the evening, seven days a week. Its elements include additional service, reliability improvements, distinctive branding, improved passenger facilities at bus stops, enhanced pedestrian access and modern low-floor buses. Frequency is especially important for attracting 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 (that is, a ten minute wait for a five-minute ride is less attractive than a ten-minute wait for a sixty-minute ride).

Frequent transit service is important for attracting riders who take short and local trips.

In parts of the region where development focuses on regional and town centers and station communities, the RTP recommends providing radial frequent transit service to serve these centers. 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.

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 suburban 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)
- Regional transit centers and stops
- Bicycle stations/parking
- Park-and-ride facilities

Transit Policy 4. Improve local transit service

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 demand for transit service, but not enough to support 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.

Types of local transit services include:

- Local Bus
- Tram
- Para-Transit
- Employer Shuttle Service

The aerial tram is one type of local transit service that connects the Oregon Health Sciences University to Portland's South Waterfront district.

Right-of-Way Needs

The components of the regional transit network have different right-of-way needs. The regional transit network has a functional hierarchy similar to that of the regional arterial and throughway network. **Table 2.8** shows the regional transit service types and right-of-way treatments.

Table 2.8
Regional transit service types and right-of-way treatment

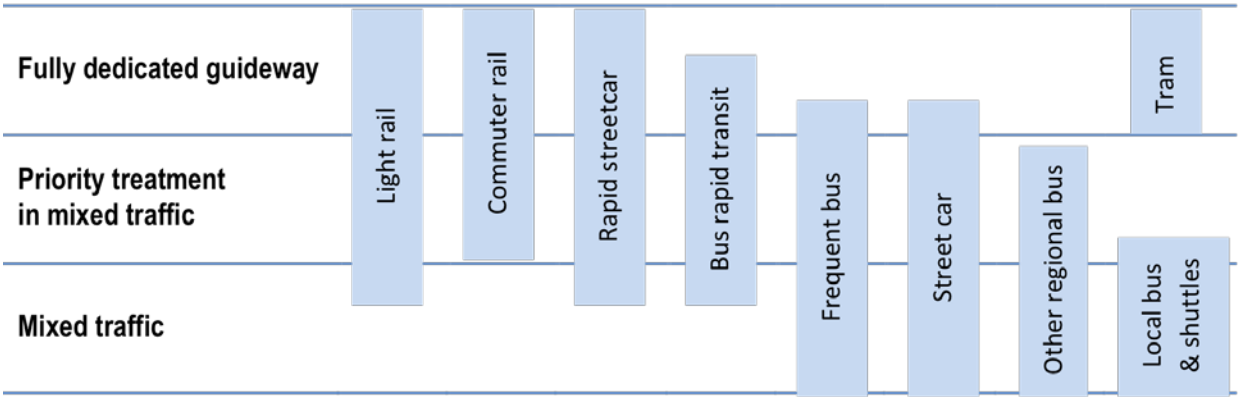


Table Notes:

- Commuter rail operates in right-of-way separated from street traffic, but in some cases may share ROW with main and branch railroad lines.
- Light rail transit, bus rapid transit and rapid street car modes generally operate in ROW separated from street traffic, but in some cases may share ROW with arterial, collector and local streets.
- Decisions about which modes are accommodated and which mode gets priority treatment within a particular roadway or rail ROW segment are made during the Corridor Refinement Plan or Alternative Analysis phase, and must consider the motor vehicle, freight, bicycle, and pedestrian functions/designations of the underlying roadway or rail line, and are subject to approval by the owner/operator of the underlying roadway or rail line.
- Refer to the glossary for detailed definitions of each mode.
- Bus rapid transit as shown in this table can include exclusive Bus Rapid Transit, as treated in the HCT Plan, and in fully or mostly dedicated right-of-way, as well as On-Street Bus Rapid Transit, which is mostly in mixed traffic.

Transit Policy 5. Support expanded commuter rail and intercity transit service to neighboring communities

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 HCT 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:[8]

- **Nonviable corridors.** Hood River, Scappoose and Sandy are not viable commuter rail markets given current and projected conditions. Even considering a very low capital cost to construct these corridors, any metric of cost per passenger served would be very high.

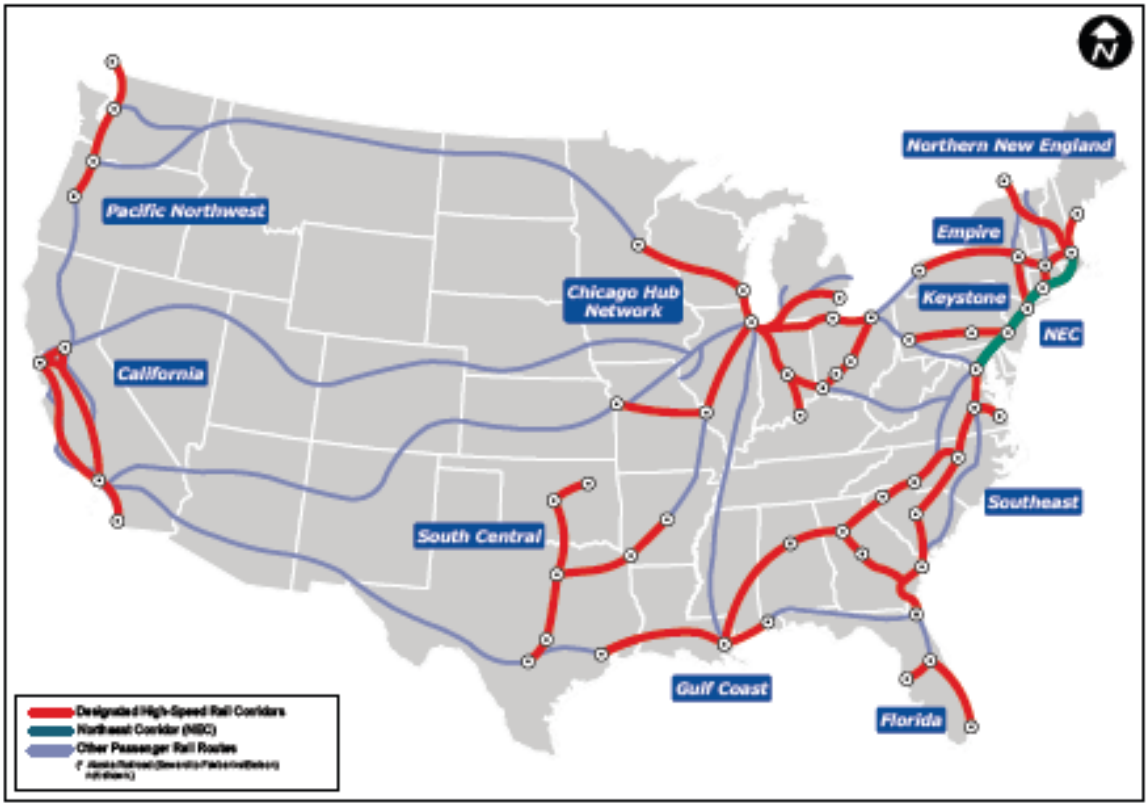
- **Potential corridor.** A potential future commuter rail line to Newberg may be feasible in the long term. Even though the riders per mile analysis looks favorable due to the relatively short distance of the line, the overall population in the rail shed is very low compared to other corridors, and overall ridership is relatively low. Metro, regional partners and corridor communities should consider right of way preservation planning for this corridor and consider land use planning activities that focus on transit supportive development around potential future commuter rail station areas.

- **Promising 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 recently passed House Bill 2408, which directs ODOT to study the possible extension of commuter rail service from Wilsonville to Salem.

[8] More detailed information on ridership potential can be found in the HCT System Plan Summary Report.

In addition, the Pacific Northwest Corridor is one of ten corridors identified for potential high-speed rail investments to better connect communities across America. Shown in **Figure 2.13**, this corridor provides an important intercity rail connection between Eugene, Oregon and Vancouver, British Columbia. More work is needed to determine what partnerships, infrastructure investments and finance strategies are needed to support this level of service. More information about current efforts to support high speed rail are described in chapter 6.

Figure 2.13
U.S. Intercity Passenger Rail Network



Source: U.S. Department of Transportation, Vision for High-Speed Rail in America (April 2009)

Transit Policy 6. Improve pedestrian and bicycle access 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 for more people. 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 and seating at stops and stations;
- 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;
- linking systems in plans.

2.5.4 Regional Freight Network Vision

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

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, 2013exports as a percentage of gross state product.

Regional Freight Network Concept

The Regional Freight Plan relies on a coordinated, integrated, multimodal and collaborative approach to integrating freight considerations into the multi-purpose transportation system and the larger land use issues in the region. It addresses the needs for freight through-traffic as well as regional 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.

Five policies to serve as the foundation of this vision:

1. **Use a systems approach to plan for and manage the freight network**
2. **Reduce delay and increase reliability**
3. **Protect industrial lands and freight transportation investments**
4. **Look beyond the roadway network to address critical marine and rail needs**
5. **Pursue clean, green and smart technologies and practices**

Freight Policy 1. Use systems approach to plan for and manage the freight network

A comprehensive, multi-modal systems approach is central to planning and managing 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 seamless flow and access for freight movement that benefits all.

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

Inside our region, throughways and arterial streets distribute freight moved by truck to air, marine, and pipeline terminal facilities, rail yards, industrial areas, and commercial centers. Rail branch lines connect industrial areas, marine terminals, and pipeline terminals to rail yards. Pipelines transport petroleum products to and from terminal facilities.

Better integrate freight issues in regional and local planning and communication
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.

Figure 2.14 shows the components of the regional freight network and their relationships.

Figure 2.14
Regional Freight Network Concept

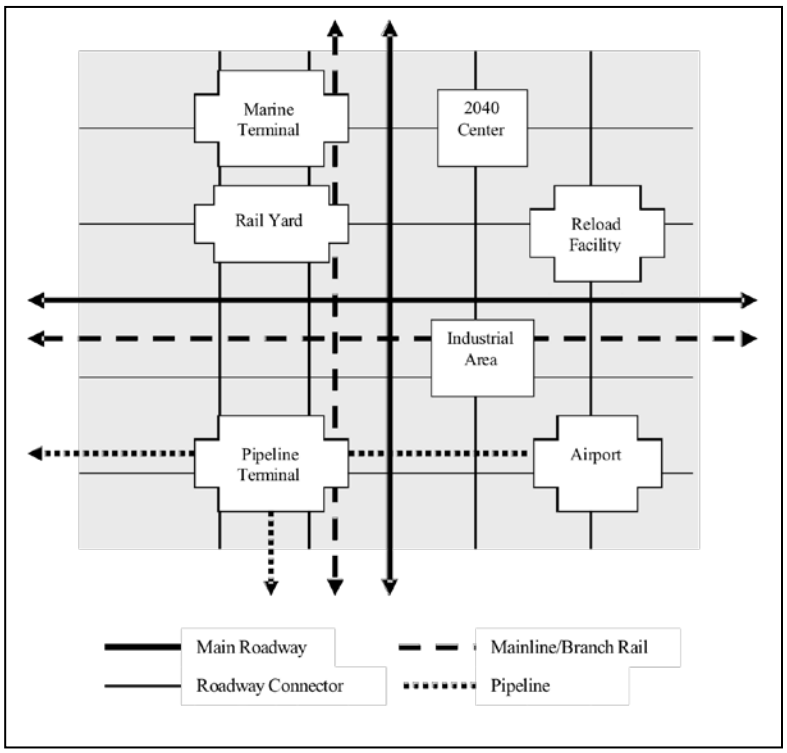
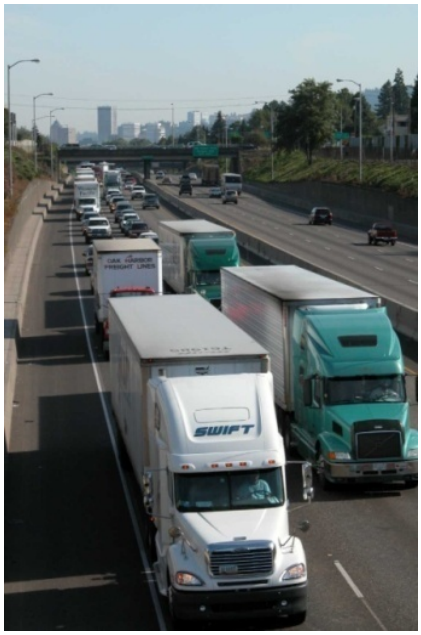


Figure 2.15 applies the regional freight network concept on the ground to identify the transportation networks and facilities that serve our region and the state's freight mobility needs. (See http://gis.oregonmetro.gov/RTP/ for zoomable version.

Freight Policy 2. Reduce delay and increase reliability

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.

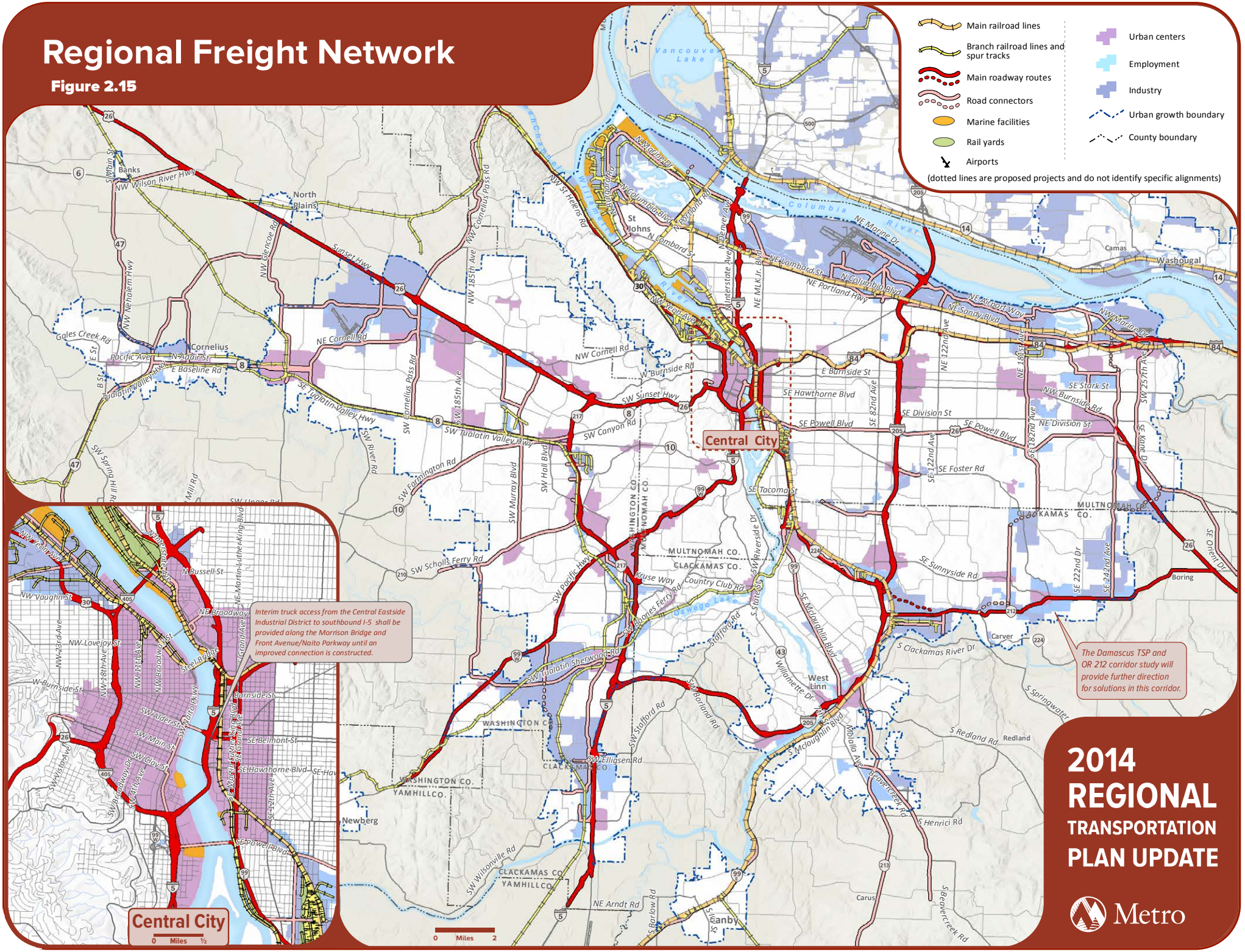
These industries depend on a well-integrated and well-functioning international and domestic transportation system to stay competitive in a global economy.



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

Regional Freight Network

Figure 2.15



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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.[9] The region's forecasted population and job growth – an additional 917,000 residents and 597,000 jobs to be added between 2010 and 2040[10] – along with the associated boost in the consumption of goods and services are significant drivers of projected increases in local freight volume.

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. This includes a more rigorous analysis of the return-on-investment of all transportation projects (a practice which may result in prioritizing freight projects in some cases) and exploration of possible expansion of public-private partnerships to fund transportation system expansion. It also requires more analysis to understand appropriate public investment in private (freight) facilities when improvements in those facilities result in public benefits.

Freight Policy 3. Protect industrial lands and freight transportation investments

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.

[9] Federal Highway Administration, Freight Analysis Framework version 3.4, 2013

[10] Metro 2040 growth forecast. Represents forecasted population and jobs within 4-county area (Multnomah, Clackamas, WAshignton, Clark).

Freight Policy 4. Look beyond the roadway network to address critical marine and rail needs

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 Chapter 1, 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.[11] 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. Channel deepening has been pursued for several decades, balanced by the need to protect various fish stocks migrating on the river.

Freight Policy 5. Pursue clean, green and smart technologies and practices

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 technologies and practices will be developed as part of the Regional Freight Plan's elaboration of a freight action plan, as identified in Chapter 10 of that plan; however examples could include support for Cascade Sierra Solutions to provide diesel emission reduction technologies in the region.

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

[11] Port of Portland, Port of Portland Rail Plan, 2013

2.5.5 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 is 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.

Integrated Regional Active Transportation Network Concept

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 frequent transit. Pedestrian-bicycle districts are urban centers and station communities.

Network guiding principles

The following ten guiding principles were developed in the Regional Active Transportation Plan to guide development of the regional active transportation network.

1. Cycling, 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 balance 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 with disabilities, people with low-English-proficiency, youth and seniors.
9. Measurable data and analyses inform the development of the network and active transportation policies.
10. Implements regional and local land use and transportation goals and plans to achieve regional active transportation modal targets.

Developing the regional active transportation network according to the guiding principles will provide a well-connected network of complete streets and off-street paths integrated with transit and prioritizing safe, convenient and comfortable pedestrian and bicycle access for all ages and abilities. This will help make walking and bicycling the most convenient and enjoyable transportation choice 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.[12]

2.5.5.1 Regional Bicycle Network Vision

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.

Regional Bicycle Network Concept

- The Regional Bicycle Network Concept has been updated based on new information, data and regional input developed in the Regional Active Transportation Plan. The regional bicycle network concept includes: A bicycle parkway in each of the region's Mobility Corridors within the urban growth boundary to provide transportation options in these corridors.

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

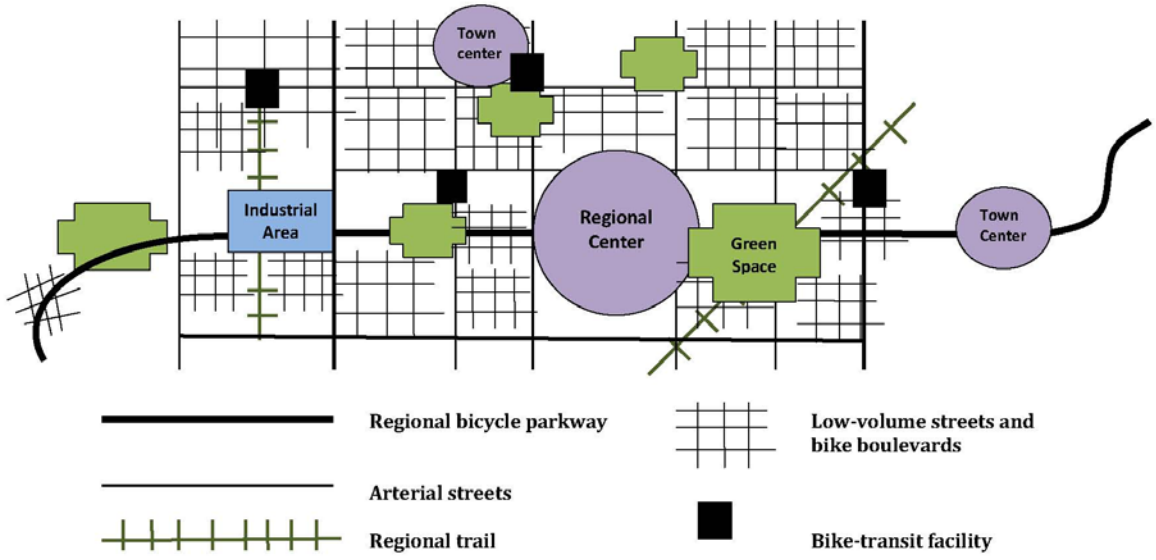
- A network of bicycle parkways, spaced approximately every two miles, that connect to and/or through every town and regional center, many regional destinations and to most employment and industrial land areas and regional parks and natural areas (all areas are connected by regional bikeways, the next 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 2.16 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 2.16
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.

This section describes the policy framework of the Regional Bicycle Network Concept. The regional bicycle policies have been refined and strengthened to reflect the policies of the Regional Active Transportation Plan. Additionally, the Regional Active Transportation Plan

identifies specific actions that Metro, in partnership with cities, counties, agencies and other stakeholders, can take to implement the policies.

Five policies form the foundation of this vision:

1. **Make walking and bicycling the most convenient, safe and enjoyable transportation choices for short trips less than three miles**
2. **Build an interconnected regional network of bicycle routes and districts integrated with transit and nature that prioritizes seamless, safe, convenient and comfortable access to urban centers and essential daily needs, including schools and jobs, for all ages and abilities**
3. **Build a green ribbon of bicycle parkways as part of the region's integrated mobility strategy**
4. **Improve bike-transit connections**
5. **Ensure that the regional bicycle and pedestrian network equitably serves all people**

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

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.[13] 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.

Bicycle travel holds huge potential for providing transportation options that can replace trips made by auto, especially for short trips. Bicycle trips made in the region for all purposes grew by 190% since 1995.[14] When bicycling is safe, comfortable, convenient and enjoyable, people have the option of making some of those short trips by bicycle.

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

A well connected bicycle network does not have gaps and is comfortable and safe for people of all ages and abilities.Regional bicycle routes connect to and through urban centers to increasing access to transit, businesses, schools, and other destinations. Regional trails and

[13] 2011 Oregon Household Activity Survey. Vehicle trips by length for trips wholly within Clackamas, Multnomah, Washington and Clark Counties.
[14] 2011 Oregon Household Activity Survey.

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.

Bicycle Policy 3. Build 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 and further developed in the Regional Active Transportation Plan.

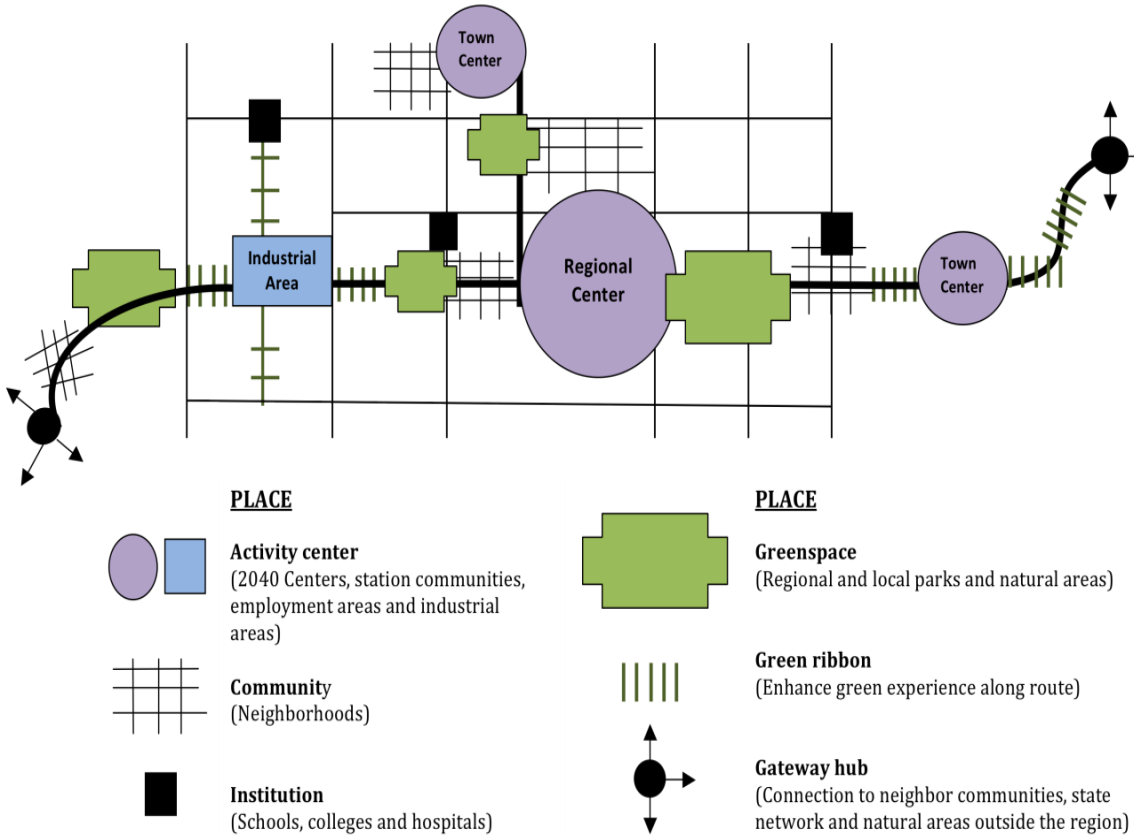
Key experiential aspects that bike parkways embody:

- 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.

Figure 2.17 illustrates this policy concept in the context of the regional bicycle parkway concept.

Figure 2.17
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 bicycle-transit connections

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

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

A key component of the bike-transit connection is bicycle parking at transit stations and stops. Bike-Transit facilities provide connections between modes by creating a "bicycle park and ride." Both TriMet and SMART currently provide bicycle parking and storage at many transit stations and stops. TriMet, with input from regional stakeholders, has developed Bicycle Parking Guidelines. The guidelines consider station context and regional travel patterns, and are focused on three major factors for parking: location, amount and design. The guidelines will help TriMet and local jurisdictions determine the appropriate location, size and design of large-scale bike-parking facilities, including Bike-Transit Facilities designated in **Figure 2.18**.

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.

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

Regional Bicycle Network Map and Functional Classifications

This section describes the regional bicycle network functional classifications shown on **Figure 2.18**, the Regional Bicycle Network. The regional bicycle network is composed of on-street and off-street bikeways that serve the central city, regional centers, town centers,

and other 2040 Target Areas, providing a continuous network that spans jurisdictional boundaries.

Figure 2.18 is a functional map illustrating how regional bicycle routes and districts work together to form a comprehensive network that would allow people to bike to transit, schools, employment centers, parks, natural areas and shopping. (See http://gis.oregonmetro.gov/RTP/ for zoomable version.)

The regional bicycle network has a functional hierarchy similar to that of the regional arterial and throughway network. **Figure 2.18** provides a vision for a future bicycle network; for a map of current bicycle facilities in the region, refer to Chapter 1.

The Regional Bicycle Network Functional Classifications have been updated based on new changes identified in the Regional Active Transportation Plan. The different functional elements of the regional bicycle network are:

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

- **Regional Bicycle Parkways** are a new functional class for the regional bicycle network. They are the highest functional class for bicycle routes and provide the spine of the bicycle network. 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** are the second functional class for bikeways and complete the regional level bicycle network. Like bicycle parkways, they provide for travel to and within the Central City, Regional Centers, and Town Centers. Regional bikeways can be any type of facility, including off-street trails/multi-use paths, separated in-street bikeways (such as buffered bicycle lanes) and bicycle boulevards. On-street Regional Bikeways located on arterial and collector streets are designed to provide separation from traffic.

- **Local Bikeways** are not identified as regional routes. However, they are very important to a fully functioning network. They are typically shorter routes with less

bicycle demand and use than regional routes. They provide for door to door bicycle travel.

- **Bicycle Districts** are a new concept for the RTP. The Central City, Regional and Town Centers and Station Communities are identified as bicycle and pedestrian districts. 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).

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.

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.

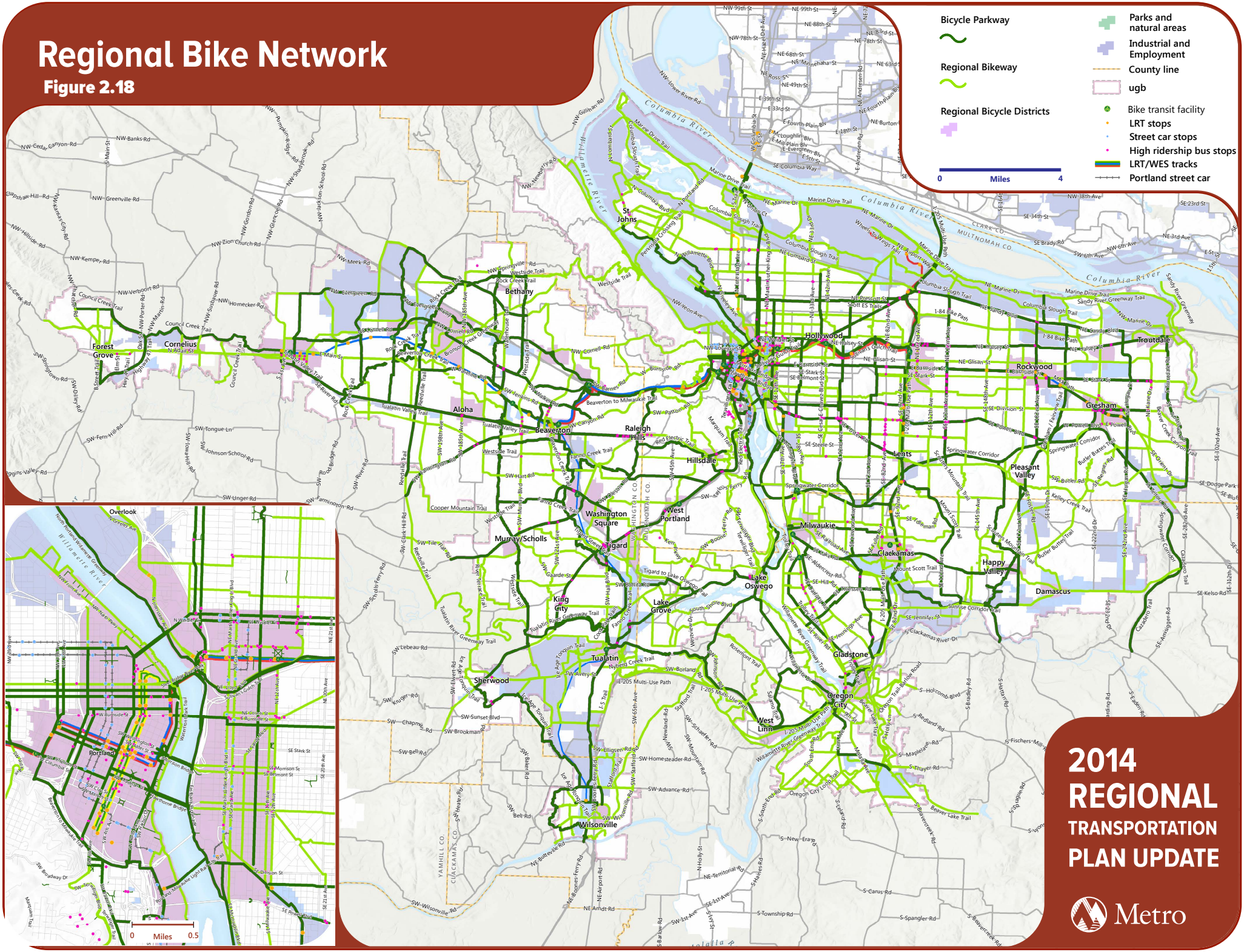
Low-volume streets often provide access to 2040 Target Areas as well as residential neighborhoods, complementing bicycle facilities located on arterial streets. Though these routes are often less direct than arterials, attributes such as slower speeds and less noise, exhaust and interaction with vehicles,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

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

Off-street facilities also complement on-street bikeways, providing access to 2040 Target Areas while providing a travel environment with fewer intersecting streets than on-street bikeways, thereby allowing for faster travel times. This makes off-street facilities especially attractive for serving long distance bicycle trips. Similar to low-volume streets, off-street facilities provide an environment more removed from vehicle traffic, which is appealing to families and new or less confident cyclists.

Regional Bike Network

Figure 2.18



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2.5.5.1 Regional Pedestrian Network Vision

Successful communities across America are increasingly defined by their walkability. Everyone walks, but too often walking is not a safe and convenient option for getting to work or school or meeting daily travel needs.[15]

Pedestrians play an important role in economic development by supporting commercial activity in centers. The RTP considers walking and bicycling as equals with other transportation modes.

Walking contributes to a healthy lifestyle for young and old alike and walking supports vibrant local economies. Every trip begins or ends with at least a short walk. Transit in particular is integrated with walking.

Walking includes getting around using wheelchairs and other forms of mobility assistance. Safe, ADA-compliant routes are particularly critical for persons who are unable to drive. It is important to remember that sidewalks and pedestrian crossings serve the needs of all mobility levels and should include design elements that help make travel as safe and convenient as possible. Many children, seniors and people with disabilities rely on transit and other elements of the regional pedestrian network.

Regional Pedestrian Network Concept

The Regional Pedestrian Network Concept has been updated based on new information, data and regional input developed in the Regional Active Transportation Plan. The regional pedestrian network is an interconnected network of pedestrian routes that link pedestrian friendly districts and provide access to destinations including transit, schools, jobs, services, shopping areas, parks and natural areas. The regional pedestrian network mirrors the regional transit network reflecting the important relationship of a complete walking network and transit.

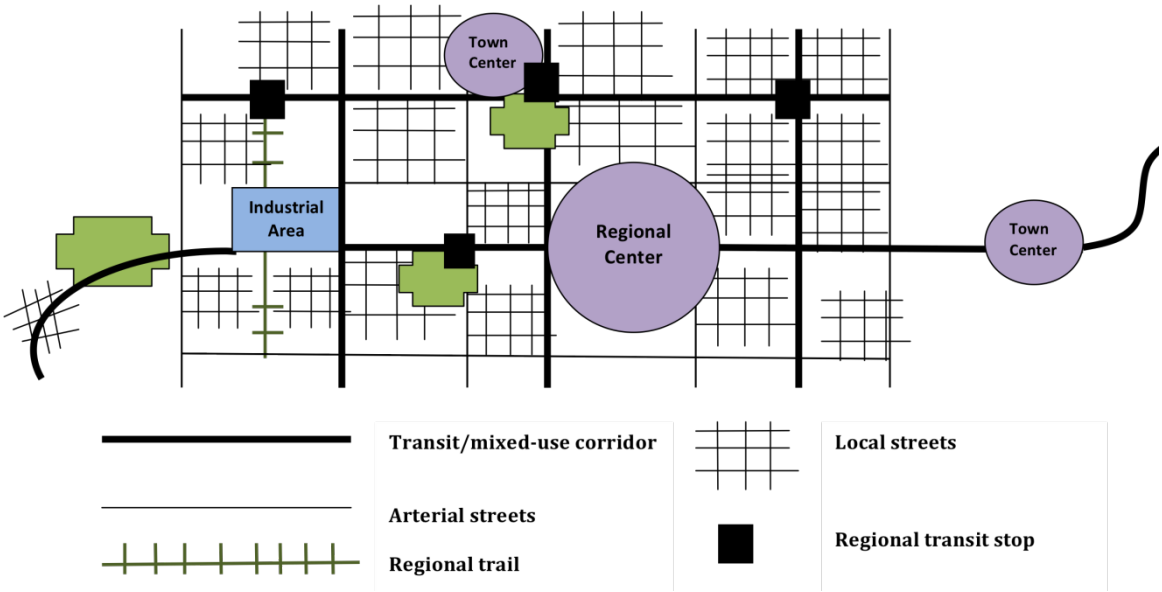
The regional pedestrian network should be complete, direct, safe, comfortable, accessible and enjoyable. People walking should feel welcomed and prioritized. Key elements of the regional pedestrian network concept include complete sidewalks, multi-use paths and trails, safe street crossings at regular intervals, illumination and streetscape details. It must be accessible to everyone regardless of one's ability to walk unassisted.

[15] Given that everyone is a pedestrian, some advocates are choosing to simply use the term "people" instead of "pedestrians."

Pedestrian activities also play a role in economic development by supporting places where people like to visit and live. Walking helps support commercial activity in neighborhoods and centers. The pedestrian network when fully developed helps people get around by safely providing links between destinations such as schools, parks, and employment sites, offers opportunities for active living, helps contribute to environmental health, supports other transportation modes, like transit, makes communities more inviting and provides a travel option that is inexpensive and accessible to most people.

Figure 2.19 shows the components of the regional pedestrian network and their relationship to adjacent land uses.

Figure 2.19
Regional Pedestrian Network Concept



The Region 2040 plan 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 RTP supports this vision with a region-wide network of on-street and off-street pedestrian facilities integrated with transit.

This section describes the policy framework of the Regional Pedestrian Network Concept. The regional bicycle policies have been refined and strengthened to reflect the policies of the Regional Active Transportation Plan. Additionally, the Regional Active Transportation Plan identifies specific actions that Metro, in partnership with cities, counties, agencies and other stakeholders, can take to implement the policies.

Five policies form the foundation of this vision:

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

2. **Build 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 essential daily needs, including schools and jobs, for all ages and abilities**

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

4. **Improve pedestrian access to transit**

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

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

As communities seek to emphasize moving people rather than cars, it is important to exploit all travel options including the most basic mode of travel. One in four trips made in America are a mile or less in length, yet only 21 percent of those trips are made on foot. [16]

In addition to being the oldest and cleanest form of transportation, walking is often the quickest and most convenient way to accomplish short trips in urban areas and neighborhoods surrounding community centers. Several characteristics of short auto trips make them especially attractive to replace with walking. In urban areas, short trips greatly contribute to arterial congestion, as well as a disproportionate amount of air pollution (due to cold starts) and crashes.[17]

In a society where over two-thirds of adults are obese or overweight[18], walking can improve both physical and mental health. A one-mile trip is a twenty-minute walk, which is two-thirds of the daily exercise regimen recommended by the U.S. Surgeon General.

Promoting walking as the preferred mode for short trips will help the region achieve the RTP performance target of tripling the share of walking trips by the year 2040. A convenient, safe and enjoyable pedestrian environment includes connected pedestrian routes, complete sidewalks physical separation from autos, safe crosswalks at regular intervals, pedestrian prioritized traffic signals, separation from bicycles on trails, well-lit streets and intersections, pedestrian scale lighting, benches, water fountains, wayfinding, bus shelters, and, ADA-compliant curb ramps.

[16] National Household Travel Survey, 2001, http://nhts.ornl.gov/
[17] Oregon Bicycle and Pedestrian Plan, 1995, http://www.oregon.gov/ODOT/HWY/BIKEPED/planproc.shtml
[18] Center for Disease Control and Prevention, 2012, http://www.cdc.gov/nchs/fastats/overwt.htm

Pedestrian Policy 2. Build 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 essential daily needs, 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 pedestrian destinations within a short distance.

Currently the regional pedestrian network is incomplete and inadequately safe; the sidewalk, crosswalk and trail network accessing transit in particular has gaps in continuity and quality, and few locations provide adequate safe crossing opportunities.

A complete pedestrian system provides a basic building block for economic vitality in centers and other commercially-oriented areas, but when incomplete fails to maximize the connection between transportation and land use that helps contribute to vibrant communities. The existence of gaps prevents the basic system from functioning uniformly throughout the region by inhibiting access to transit, limiting access to centers and other community-level destinations, such as parks and schools. It is important for local jurisdictions to pursue crosswalks meeting the regional spacing guidelines, including at every transit stop, and sidewalks on every street, except expressways and certain low traffic streets, even if they are not defined as part of the regional pedestrian network.

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.

Emphasis should be given to filling gaps and providing safe crossings of the busiest streets. Access to schools, parks and community centers that are active parts of the local community is important for influencing a healthy lifestyle that includes walking.

Regionally, more attention is needed toward providing safe crossings, particularly of multi-lane arterials, which tend to serve as barriers to walking. Two-thirds of the region's fatal and severe injury pedestrian crashes occurred on arterial roadways, with half occurring on streets with 4-lanes or more. Regional policy calls for safe crossings of streets and controlled pedestrian crossings on major arterials, including features such as markings, medians, refuge islands, beacons, and signals, as appropriate. Crossings should be located at or near all transit stops. Where crossings are not provided, pedestrians will often cross anyway, without the benefit of a safe place to cross. Pedestrian crashes on high-speed arterial streets often result in a fatality or severe injury.

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

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

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

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

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

Pedestrian Policy 4. Improve pedestrian access to transit

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

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

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

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.

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

Regional Pedestrian Network Map and Functional Classifications

This section describes the regional pedestrian network functional classifications shown on **Figure 2.20**, the Regional Pedestrian Network. The regional pedestrian network is composed of on-street and off-street walkways that serve the central city, regional centers, town centers, and other 2040 Target Areas, providing a continuous network that spans jurisdictional boundaries.

The regional pedestrian network has a functional hierarchy similar to that of the regional arterial and throughway network. **Figure 2.20** provides a vision for a future pedestrian network; for a map of existing pedestrian facilities in the region, refer to Chapter 1.

The Regional Pedestrian Network Functional Classifications have been updated based on new changes identified in the Regional Active Transportation Plan. The different functional elements of the regional bicycle network are:

- **Pedestrian Parkways** are a new functional class for pedestrian routes on the regional pedestrian network and the highest functional class. They are high quality and high priority routes for pedestrian activity. Pedestrian Parkways are generally major urban streets that provide frequent and almost frequent transit service (existing and planned). They can also be regional trails. Adequate width and separation between pedestrians and bicyclists should be provided on multi-use trail parkways.

- **Regional Pedestrian Corridors** are the second highest functional class of the regional pedestrian network. On-street 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. These routes are also expected to see a high level of pedestrian activity.

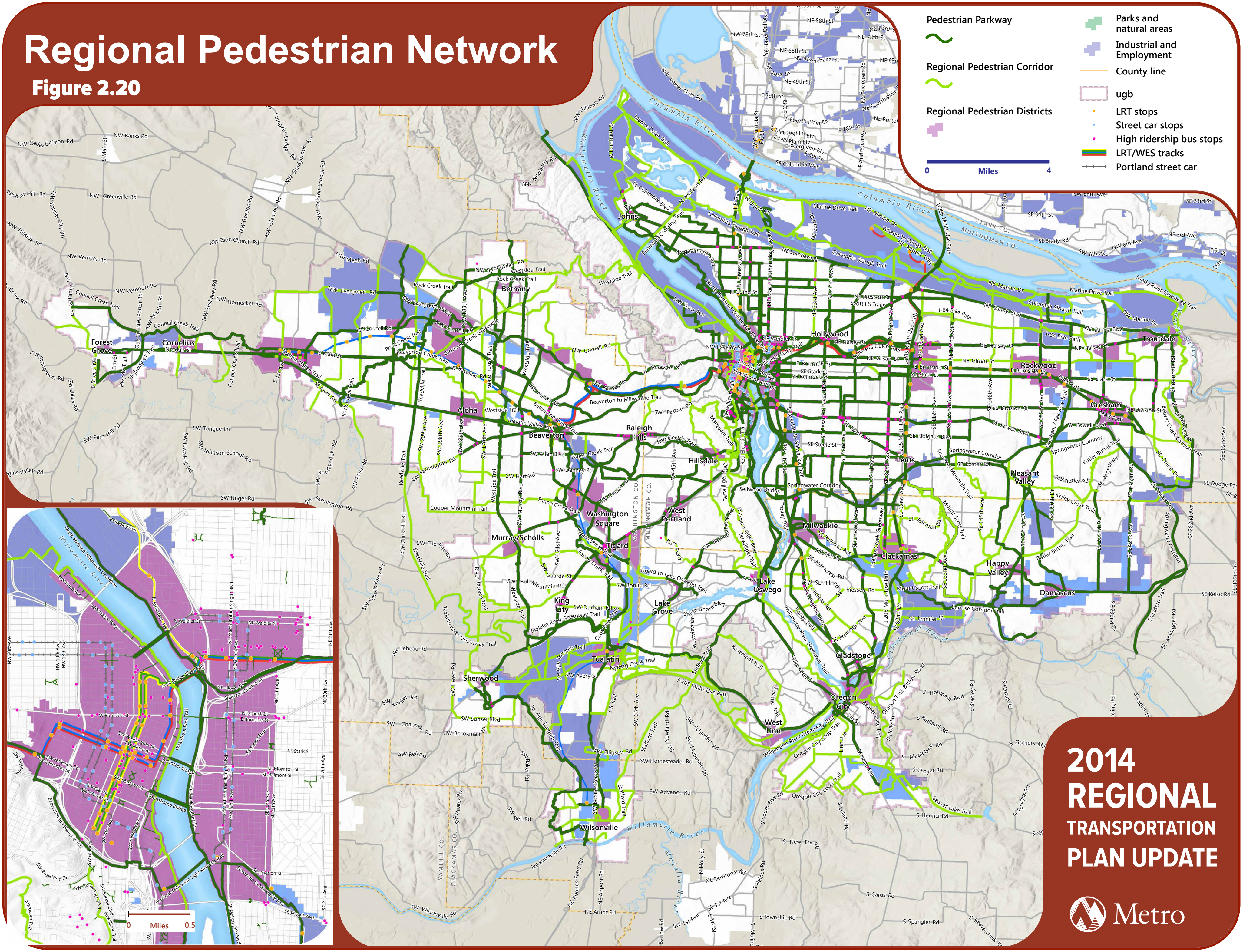
- **Local Pedestrian Connectors** are all streets and trails not included on the regional pedestrian network. Connectors, however, are an important element of the regional pedestrian network because they allow for door-to-door pedestrian travel.

- **Pedestrian Districts** are the Central City, Regional and Town Centers and Station Communities shown on the Regional Pedestrian Network Map. Several station communities along the Portland Milwaukie and the Portland Clackamas light rail lines were added in the network map update. 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. Within a Pedestrian District, some routes may be designated as a Pedestrian Parkway or Regional Pedestrian Corridor, however all routes within the Pedestrian District are part of the regional pedestrian network.

Figure 2.20 applies the regional pedestrian network concept on the ground, illustrating how different regional pedestrian facilities work together to form a comprehensive network that would allow people to walk to transit, schools, employment centers, parks, natural areas and shopping. (See http://gis.oregonmetro.gov/RTP/ for zoomable version.

Regional Pedestrian Network

Figure 2.20



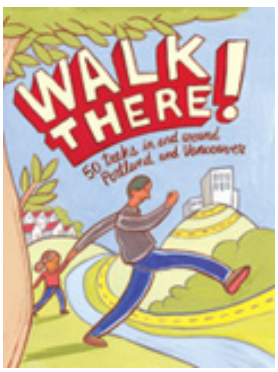
2014 REGIONAL TRANSPORTATION PLAN UPDATE

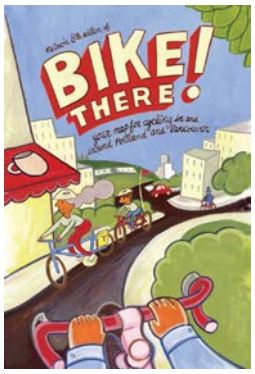
Metro

2.5.6 TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS (TSMO) VISION

The overarching theme of the region's Transportation System Management and Operations (TSMO) vision is that the transportation system represents a significant public investment in assets that must be protected and well-managed. Concerns over the social, environmental and financial cost of traditional solutions lend support for an integrated approach to the provision of transportation infrastructure and services where better management of the system has a prominent role.

TSMO is a set of integrated transportation solutions intended to improve the performance of existing and new transportation infrastructure. Through a combination of transportation system management (TSM) and transportation demand management (TDM) systems, services and projects, TSMO addresses transportation goals such as mobility, reliability, safety and accessibility, which have traditionally been achieved via larger scale, expensive infrastructure investments.





Metro also operates the region's demand management programs, which include an educational component to increase awareness of travel choices in the region.

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.

Four policies form the foundation of this vision:

1. **Use advanced technologies, pricing strategies and other tools to actively manage the transportation system**
2. **Provide comprehensive real-time traveler information to people and businesses**
3. **Improve incident detection and clearance times on the region's transit, arterial and throughway networks**
4. **Implement incentives and programs to increase awareness of travel options and incent change**

The Regional TSMO plan is guided by the following vision, goals and guiding principles:

Vision: The Portland metropolitan region will collaboratively and proactively manage its multimodal transportation system to ensure safe, reliable, efficient, and equitable mobility for people and goods. The region will strive to be a nationally recognized leader for innovative management and operations of its system.

Goal 1: Reliability – Provide reliable travel times for people and goods movement.

Goal 2: Safety and Security – Enhance transportation safety and security for all modes

Goal 3: Quality of Life – Enhance the environment and quality of life by supporting state and regional greenhouse gas and air quality goals

Goal 4: Traveler Information – Provide comprehensive multimodal traveler information to people and businesses.

Guiding Principle 1: Regional Partnerships – Enhance regional partnerships that support collaborative investment and implementation of management and operations strategies that benefit the region.

Guiding Principle 2: System Performance – Monitor transportation system performance and evaluate system management strategies to aid equitable policy and sustainable investment decisions.

Guiding Principle 3: Investment in Ongoing Operations – Provide on-going maintenance and operations to support the transportation system.

When compared to traditional capital investments such as new transit service, roads or additional lanes, TSMO solutions offer high returns for a comparatively low cost, and can delay or remove the need for additional capital-intensive infrastructure. In addition to replacing expensive capital projects, TSMO solutions can also complement them with education and marketing. The City of Portland has found that coupling capital investments in biking, walking and transit infrastructure with programs that encourage and help people to use them can maximize return on investment. TSMO strategies support many regional transportation goals including:

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

Table 2.9 provides examples of TSMO strategies for each of the investment areas.

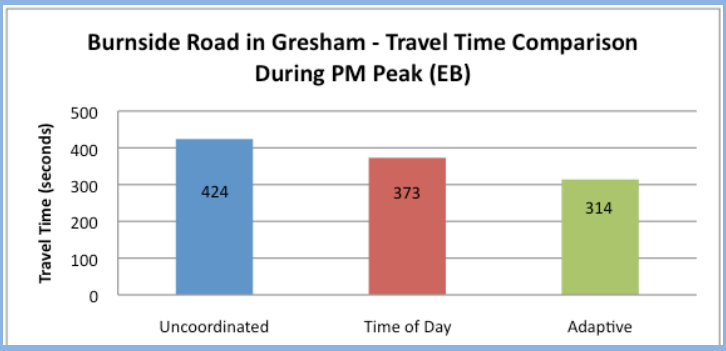
Table 2.9
Examples of TSMO strategies by investment area

Multimodal Traffic Management • Traffic signal coordination • Transit signal priority treatment • Detection and countdown timers for bicycles and pedestrians	**Traffic Incident Management** • Improve surveillance • Expand incident management teams and training
Traveler Information • Real-time traveler information for freeways and arterials • Enhance traveler information tools	**Transportation Demand Management** • Ridesharing • Collaborative marketing (e.g., Drive Less Save more campaign) • Individualized marketing (e.g. SmartTrips program) • Transportation Management Associations • Employer outreach

TSMO Policy 1. Use advanced technologies, pricing strategies and other tools

Multimodal traffic management strategies improve metropolitan mobility by applying technology solutions to actively manage the transportation system. Projects in this area 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.



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

Parking management strategies can include shared parking that serves multiple businesses, timed parking and parking pricing.

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

Value pricing—sometimes called congestion pricing —involves the application of market pricing (through variable tolls, variable priced lanes, area-wide charges or cordon charges) to the use of roadways at different times of day. While this tool has been successfully applied in other parts of the U.S. and internationally, it has not been applied in the Portland metropolitan region to date. In 2008, the Oregon Department of Transportation (ODOT) researched the potential effects of tolling/pricing to determine if and how tolling could be applied in Oregon.[19] ODOT will research the application of this tool in the Portland metropolitan region and identify a pilot project to further test this strategy in response to House Bill 2001, which was adopted by the 2009 Legislature.

[19] A series of white papers are available that summarize this research at www.oregon.gov/ODOT/TD/TP/Tolling_Background.shtml

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

TSMO Policy 2. Provide comprehensive real-time traveler 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 informed travel decisions.

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.

In 2008, TripCheck.com received more than 23 million visits. Surveys show that information influenced travel decisions for 60 percent of site visitors.

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 Portland Metro 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.

TSMO Policy 3. Improve traffic incident detection and clearance times on the region's transit, arterial and throughway networks

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.

Past studies show:

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

Active traffic management can:

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

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 2.10**. When lanes are blocked due to an incident capacity decreases significantly (even when the incident is on the shoulder) and travelers experience delays.

Table 2.10
Detecting and clearing incidents quickly restores lost capacity

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

Source: TRB[20]

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.[21]

TSMO Policy 4. Implement market-based incentives and programs to increase awareness and use of travel options

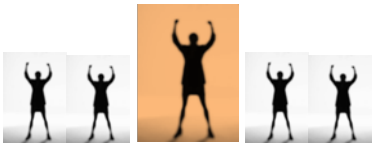
TSMO also manages transportation from the demand side to help residents and employees of the region increase their awareness and use of travel options and reduce their trips made driving alone. Transportation demand management (TDM) strategies increase the share of trips that have a lower impact on the transportation system. TDM projects support rideshare and employer commuter services, expand collaborative marketing campaigns for travel options, and incorporate employer and youth transit pass programs.

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

All modes benefit from TDM projects. TDM projects raise general awareness about walking, bicycling and transit use, which increases safety for all users. TDM projects encourage travelers with flexibility to use non-drive alone options, such as walking, biking or vanpooling, or travel during off-peak hours.

By providing travel information and option incentives like employer or youth passes, this will provide incentives for people to adjust their travel behavior from driving to walking, bicycling, and taking transit. Benefits from this

Drive less. Save more. 1 out of 5 Portland residents reduced car trips due to the campaign.



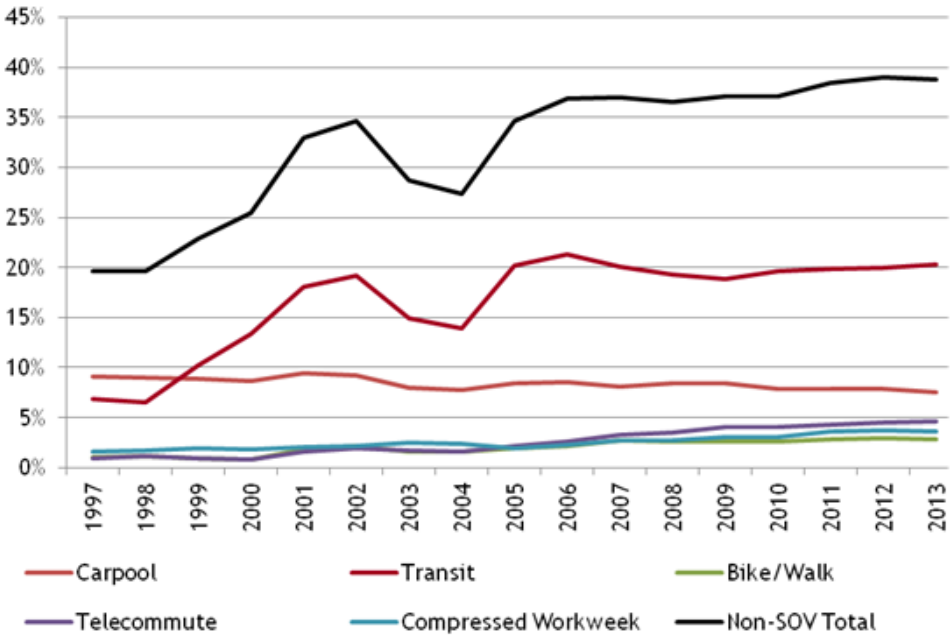
Source: Moore Information, Inc, January 2009

[20] Highway Capacity Manual 2000. *Transportation Research Board, National Research Council, Washington, D.C., 2000.*
[21] Research and Innovative Technology Administration (RITA) Intelligent Transportation Systems Benefits Database. Website: http://www.benefitcost.its.dot.gov/its/benecost.nsf/BenefitsHome (June 2009)

change in travel behavior include healthier people, reduced roadway injuries and fatalities, reduced personal transportation costs, reduced air pollutants, and improved travel times and for other roadway users.

As an example, RTO partners provide services to over one thousand employers throughout the Portland region. Employers may implement travel option programs such as buying transit passes for their employees. Over the last sixteen years, employee commute trips that used non-drive alone modes (transit, bicycling, walking, carpooling/vanpooling, and telecommuting) rose from 20 percent to over 39 percent among participating employers.

Figure 2.21 Effectiveness of Employer-Based Commuter Programs



Employer-based commuter programs have resulted in significant increases in walking, biking and use of transit.

Source: Steer Davies Gleave, March 2014

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 GHG emissions.

2.5.7 TRANSLATING THE VISION INTO REALITY

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 in Chapter 4, form the basis for identifying system needs and deficiencies in the regional mobility corridor atlas and the investment priorities in Chapter 3. 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 specific elements of the vision.

Implementation of the RTP will result in a safe, reliable and interconnected transportation system for all modes of travel.