Agenda

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

Meeting: Transportation Policy Alternatives Committee (TPAC) and Metro Technical Advisory Committee (MTAC) Workshop
Date: Wednesday, April 17, 2019
Time: 10:00 a.m. – 12 p.m.
Place: Metro Regional Center, Council Chamber

10:00 am	**1.**		**Call To Order and Introductions**	**Tom Kloster, Chair**
10:10 am	**2.**		**Public Communications On Agenda Items**	
10:15 am	**3.**	*	**Designing Livable Streets & Trails Guidelines** Purpose: Provide TPAC and MTAC with an overview on the Designing Livable Streets and Trails Guide and regional street design policy.	**Lake McTighe, Metro**
11:15 am	**4.**	*	**Regional Emergency Transportation Routes Work Plan** Purpose: Provide an update on the project approach and timeline and seek input on these questions: • What should RDPO and Metro consider as we begin this project? • Regional ETRs need to _____. • Regional ETRs should connect _____. • What opportunities do you see with this project? • What questions do you have about this project? • Is there anything else you want to tell us?	**Kim Ellis, Metro** **Laura Hanson, RPDO**
12 p.m.	**5.**		**Adjourn**	**Tom Kloster, Chair**

Next MTAC Meeting: May 15, 2019 (if cancelled, notification will be sent)

Next TPAC/MTAC Workshop Meeting: June 19, 2019 (if cancelled, notification will be sent)

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Metro

August 2016

2019 MTAC meetings and TPAC/MTAC workshop meetings Work Program
4/9/19

January 16, 2019 – MTAC Meeting Comments from the Chair Agenda Items • 2019 Schedule and Proposed Agenda Items • 2018 UGB Decision Debrief • 2019 Housing Bond Work	
March 20, 2019 – MTAC Meeting – Cancelled Comments from the Chair Agenda Items	**April 17, 2019 – TPAC/MTAC Workshop** Comments from the Chair Agenda Items • Designing Livable Streets & Trails Guidelines (McTighe) • Regional Emergency Transportation Routes Work Plan (Kim Ellis, Metro/Laura Hanson, RPDO)
May 15, 2019 – MTAC Meeting Comments from the Chair Agenda Items	**June 19, 2019 – TPAC/MTAC Workshop** Comments from the Chair Agenda Items • Regional Mobility Policy Update (Kim Ellis, Metro/ Lidwien Rahman, ODOT; 60 min)
July 17, 2019 – MTAC Meeting Comments from the Chair Agenda Items	**August 21, 2019 – TPAC/MTAC Workshop** Comments from the Chair Agenda Items
September 18, 2019 – MTAC Meeting Comments from the Chair Agenda Items • Designing Livable Streets & Trails Guidelines (McTighe)	**October 16, 2019 – TPAC/MTAC Workshop** Comments from the Chair Agenda Items • State of Transportation Safety Within the Region (McTighe)
November 20, 2019 – MTAC Meeting Comments from the Chair Agenda Items	**December 18, 2018 – TPAC/MTAC Workshop** Comments from the Chair Agenda Items

Parking Lot:

MTAC meetings held every other month as needed (January, March, May, July, September, and November) on the 3rd Wednesday of the month from 10:00 a.m. to 12 p.m.

TPAC meets the 1st Friday of the month unless otherwise noted. 9:30 a.m. to 12 p.m.

TPAC/MTAC workshops are held four times a year (April, June, August, and October) on the 3rd Wednesday of the month from 10:00 a.m. to 12 p.m. The December meeting will be held if needed.

For TPAC and MTAC meetings and workshop agenda and schedule information, call 503-797-1766 or e-mail marie.miller@oregonmetro.gov
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Memo

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

Date: April 10, 2019

To: Transportation Policy Alternatives Committee (TPAC), Metro Technical Advisory Committee (MTAC) and interested parties

From: Lake McTighe, Regional Transportation Planner

Subject: Designing Livable Streets and Trails Guide – Design Classifications

Purpose: Provide TPAC and MTAC with an overview on the Designing Livable Streets and Trails Guide and regional street design policy

Objective: TPAC and MTAC understand what will be included in the new guidelines and how the guidelines are used, and provide input on regional street design classifications

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Overview
Working with a technical work group (see Attachment 2), Metro is in the final stages of updating the region's street and trail design guidelines to support the region's efforts to connect land use and transportation through better design. The guidelines provide a performance-based framework and recommend best practices in design to achieve regional and community desired outcomes.

At the TPAC/MTAC workshop, staff will provide a high level overview of the project. The majority of the workshop time will be focused on reviewing and discussing regional street design classifications, which are described in Chapter 3 of the draft design guidelines (see Attachment 3).

Project Background
Since 1996, Metro has provided policies and tools to link transportation design and functions to land use to implement the Region 2040 Growth Concept and to advance Metro's core mission to preserve and enhance the quality of life and the environment for today and future generations. Metro developed a suite of handbooks - *Creating Livable Streets, Green Streets*, *Trees for Green Streets, Wildlife Crossings* and *Green Trails* - to support design to link land use and transportation.

The Designing Livable Streets and Trails Guide project updates the regional *Creating Livable Streets*, *Green Streets* and *Trees for Green Streets* handbooks (now over 17 years old), provides new regional trail/multi-use path design guidelines and combines the guidance into one holistic guide. Elements of the *Wildlife Crossings* and *Green Trails* handbooks are incorporated into the new guidelines, but are not being updated.

The current design guideline handbooks to build safe and healthy streets were last updated in 2002. Since that time, many transportation policies have been updated and our understanding of transportation design has evolved through practice and research:

- Regional transportation policy has evolved with the adoption of an outcomes-based planning framework.
- Regional freight, safety and active transportation plans and the 2014 Climate Smart Strategy include recommended changes and updates.
- The role of livable streets to help address traffic congestion and improve safety and mobility options for all modes is better understood.
- National research and efforts related to street design have continued to expand, especially for bikeway, roundabout and intersection designs.
- Addressing regional challenges, such as a growing aging population, increasing diversity, demand for safe routes to school, the high rate of fatal pedestrian crashes, climate change and decreasing mobility for buses require creative and up-to-date street design solutions.

The project is divided into two phases. In the first phase, the technical work group developed an annotated outline that described what content would be included in the updated design guidelines. The second phase consists of developing the content, graphics and layout. The guidelines will be finalized in the summer of 2019 (see Attachment 1).

Designing Livable Streets and Trails Guide – Content Overview
The Designing Livable Streets and Trails Guide will be approximately 125 pages in length and include drawings, diagrams, photographs, a glossary and links to additional resources. The following provides a short description of the six chapters in the guide.

Chapter 1: Introduction

Provides an overview, the purpose of the guide, how to use the guide and who will use the guide.

Chapter 2: Regional Policy and Desired Outcomes

Provides history of regional street design guidance and what has changed over the years. It includes lessons learned, emerging trends, desired outcomes, policies pertinent to street design and a description of performance-based design. The desired outcomes are:

- Safety, Healthy People, Reduce CO2 Emissions, Vibrant Communities, Transportation Choices, Security, Sustainable Economic Prosperity, Resiliency, Efficient and Reliable Travel, Healthy Environment, Social Equity and Fiscal Stewardship.

Chapter 3: Street Functions and Design Classifications

Introduces and describes the functions of streets and trails, and how they relate to the desired outcomes identified in Chapter 2. Introduces the different functions of streets and trails and the Regional Design Classifications and which functions each design classification should prioritize. The functions are:

- Mobility and Access for Pedestrians, Bicycles, Transit, Freight and Motor Vehicles; Place-Making and Public Space; Corridors for Nature and Stormwater; Utility Corridors; Physical Activity; Emergency Response

The Regional Design Classifications are:

- Freeways and Highways; Regional and Community Boulevards; Regional and Community Streets; Industrial Streets; a Parkway design overlay and Regional Trails are also included in this section. A table that ties functions to the design classification and regional trails is introduced to help navigate trade-offs in the design decision-making phase.

Chapter 4: Design Principles and Elements

Introduces the different "realms of the street" and discusses on-the-ground physical design elements and design considerations from motor vehicle lane widths to stormwater treatments to intersections and crossings. Provides a set of design principles to guide design. The design principles are:

- The Safe Systems Approach; Safe Speeds; Designing for All Users; A Connected Street Network; A Flexible Approach to Design; Protecting Our Environment; Designing for the Future We Want

Chapter 5: Visualizing Street and Trail Design

Provides illustrative examples of what the design elements look like for the design classifications and trails and in a variety of contexts (e.g., existing, constrained Regional Boulevard in a dense town center, or new Regional Street in a 2040 corridor). The examples

will include schematic drawings for each design classification and trails to illustrate that one size does not fit all and flexibility in design.

Chapter 6: Performance-based decision making framework

Provides a framework to guide decision-making during the design phase of a project. The guidance in this chapter is flexible enough that a variety of jurisdictions can use it to make decisions, and also use it to explain their decision-making process to other agency stakeholders, members of the public, elected officials, etc.

Supplemental: Implementation Strategies and Case Studies (*to be completed after the guidelines)*

Provides implementation strategies illustrated with real projects to describe project development and how the design comes together following the decision-making process in Chapter 6. Case studies will cover a range of topics and projects, aiming to show a variety of themes that different agencies can relate to. Each case study will be 1-2 pages and will include images and potential diagrams as well as explanatory text. Case studies will be either completed, or based on potential redesigns of existing streets.

Regional street design classifications and policy in the RTP

Street design policies have been included in the Regional Transportation Plan (RTP) since 1996, and provide high level design guidance for regional streets. The first street design classification map was included in 2000. Since that time, the intent of the policies, to link land use and transportation and support implementation of the 2040 Growth Concept, has not changed. Changes to the design classifications and design classification map have been made as needed when the RTP is updated, in coordination with local jurisdictions, the public and other stakeholders

The regional street design policy section was updated in the 2018 RTP. Updates included adding in a description of the different functions streets serve; adding in reference to performance-based design; adding narrative descriptions of the street design classifications (in addition to the cross sections) back in; updating the cross sections of the different design classifications to reflect greater separation for pedestrian and bicycle facilities, consistent with the Regional Active Transportation Plan, Regional Freight Strategy and Regional Transportation Safety Strategy; and added a section on designing streets for health and safety. Chapter 8 of the RTP includes an implementation activity to develop specific street design and green infrastructure policies prior to the update of the 2023 RTP.

Updates were also made the Regional Street Design Classification Map (see map in Attachment 4). The Design Classification Map in Chapter 2 of the RTP is a policy map which identifies the design concepts that need to be considered to address federal, state and regional transportation planning policies. While regional trails and some local and collector roadways are part of the regional bicycle and pedestrian networks, the design classification map identifies design concepts only for major roadways because it is these roadways where the greatest trade-offs in design must be considered.

As described in the draft Chapter 3 of the new guidelines, regional street design classifications are only applied to throughways and arterials identified in the RTP. The Regional Street Design Classification Map was updated to reflect any changes made to the RTP Motor Vehicle System map, such as functional classification change. Additionally, any roads identified as Intermodal Connectors on the Regional Freight Network Map were assigned the Industrial Street design classification. It is anticipated that the street design classification map will need to be updated as part of the 2023 RTP to reflect changes in local Transportation System Plans and Comprehensive Plans.

Process
Metro received a regional flexible fund grant to update the design guidelines. The project has been underway, though not continuously, since 2016 (see Attachment 1). A technical work group composed of city, county and agency engineering and planning staff, community members and transportation advocates has been meeting since 2017 providing technical guidance (see Attachment 2). Additionally, public comments on policies related to street and trail design were provided during the update of the 2018 Regional Transportation Plan. A majority of the comments focused on the need for multimodal safety and additional policies for green infrastructure. Polices for street design and green infrastructure will be developed with stakeholder input before the next update of the RTP in 2023.

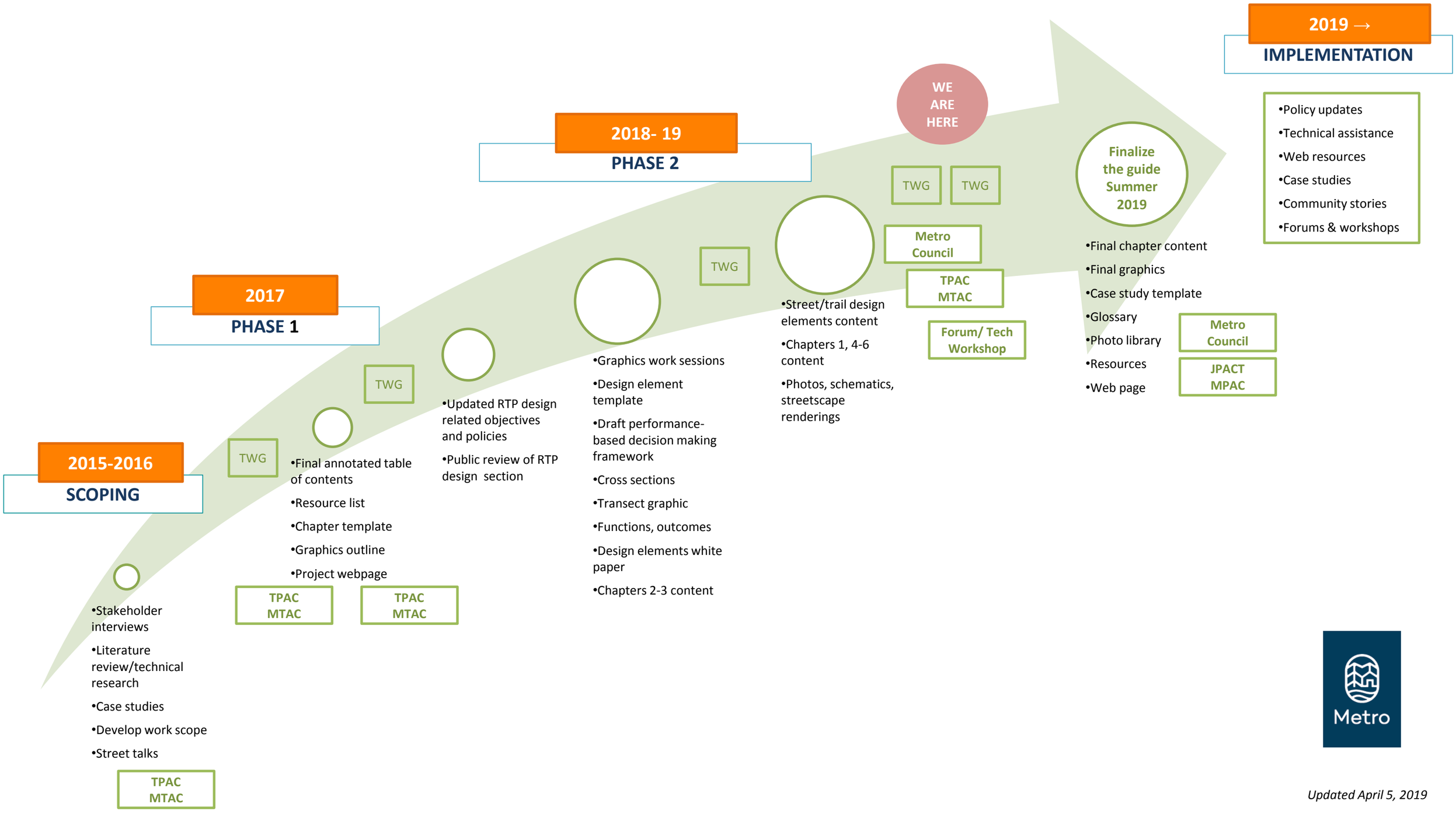
TPAC and MTAC provided input on the annotated outline for the new guidelines in November 2017. Since that time, Metro has been working with Kittelson and Associates and the technical work group to develop the content. The guidelines will be completed in late summer – early fall 2019 and provided on an updated webpage with case studies linked to a map of the region, a photo library and renderings.

The Metro Council will consider adoption of the guidelines in fall 2019. As with the current guidelines, all jurisdictions must allow implementation of the design guidance, and projects designed and/or constructed with regionally allocated funding must be consistent with the design guidance.

Next Steps
- April 22- Policymakers forum and technical workshop on performance-based design
- May 6 – draft design guidelines sent to Technical Work Group and interested parties (including TPAC and MTAC)
- May 20 – final meeting of the technical work group to review rough draft of guidelines
- May 24 – deadline to provide additional comments to Metro staff on design guidance
- June to early fall – finalize guidelines
- Early fall - Metro Council considers guidelines for adoption

Attachments
Attachment 1: Project timeline
Attachment 2: List of technical work group members
Attachment 3: *Draft* Chapter 3 Design Functions and Classifications
Attachment 4: Graphics handout:
    - Desired outcomes
    - Land Use and Transportation Transect graphic
    - Livable Streets Functions graphic
    - 2018 RTP Regional Street Design Classifications policy map
    - Street design classification illustrative cross sections
    - 2018 RTP pedestrian, bicycle, transit, freight and motor vehicle network policy maps
    - Performance-based design decision-making framework

Designing Livable Streets + Trails Project Timeline & Deliverables



Updated April 5, 2019

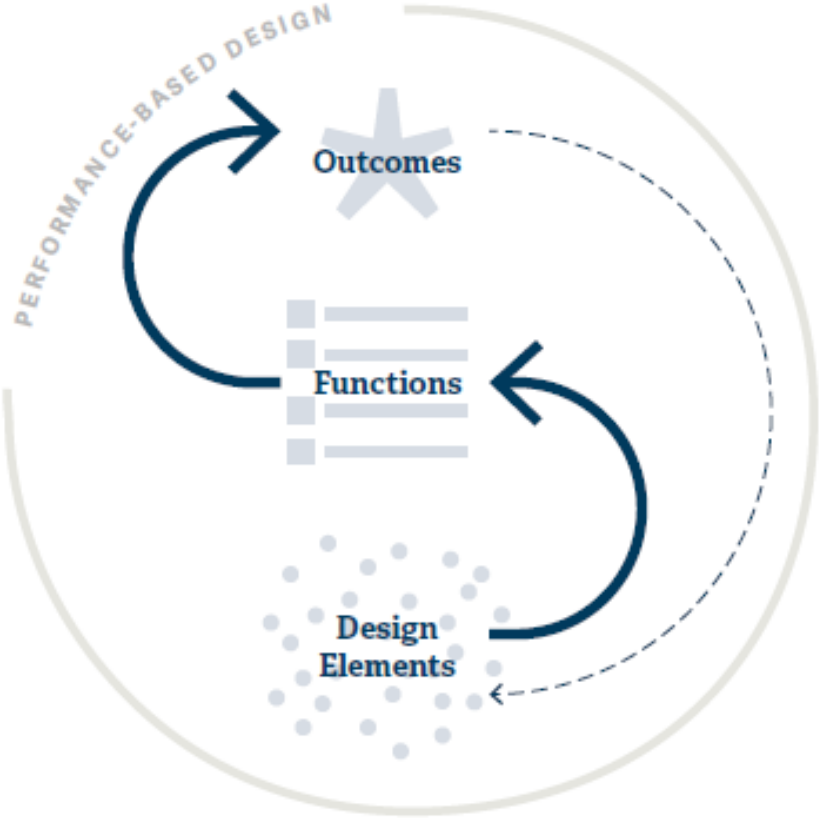
Designing Livable Streets and Trails Work Group Members

Bob	Sallinger	Audubon Society of Portland
Stacy	Revay	City of Beaverton
Richard	Blackmun	City of Forest Grove
Jay	Higgins	City of Gresham
Chris	Strong	City of Gresham
John	Boren	City of Hillsboro
Tim	Kurtz	City of Portland, BES
Scott	Batson	City of Portland, PBOT
Denver	Igarta	City of Portland, PBOT
Zef	Wagner	City of Portland, PBOT
Maya	Agarwal	City of Portland, PP&R
Robert	Galati	City of Sherwood
Julia	Hajduk	City of Sherwood
Mike	McCarthy	City of Tualatin
Rich	Mueller	City of Tualatin
Lance	Clavert	City of West Linn
Zach	Weigel	City of Wilsonville
Scott	Hoelscher	Clackamas County
Rick	Nys	Clackamas County
Tom	Liptan	Landscape architect
Anthony	Buczek	Metro
Lake	McTighe	Metro
Robert	Spurlock	Metro
Carol	Chesarek	MTAC alternate
Scott	Adams	Multnomah County
Brendon	Haggerty	Multnomah County - Public Health
Zachary	Horowitz	Oregon Department of Transportation, Region 1
Rich	Crossler-Laird	Oregon Department of Transportation, Salem
Claire	Vach	Oregon Walks
Kari	Schlosshauer	Safe Routes to School National Partnership
Jerry	Zelada	The Street Trust
Grant	O'Connell	TriMet
Jeannine	Rustad	Tualatin Hills Park and Recreation District
Nick	Fortey	US DOT FHWA
Rob	Saxton	Washington County
Dyami	Valentine	Washington County

CONTENTS

INTRODUCTION

This chapter introduces the concepts of design **functions** and regional **design classifications**. In this guide, a "design function" or simply "function" is a use or purpose that individual streets and trails can serve, thereby contributing to the desired systemwide outcomes described in Chapter 2. The primary functions served by a street or trail are determined by multiple factors including adjacent land use, modal plan priorities and street connectivity. Different functions may be prioritized on different streets and trails contributing to the overall performance of the transportation system. Chapter 6 provides a decision-making framework to help determine which functions should be prioritized during project design and how to work though trade-offs in design. In this way, we can create a regional system of streets and trails that serves all functions and leads to the systemwide outcomes. The functions are illustrated in Figure X on the following pages and described further in Section 3.1.



In 1996, the region adopted regional design classifications, described in Section 3.2. The design classifications are directly related to the land use types described in the 2040 Growth Concept (illustrated in Chapter 2). As such, the design classifications are also related to the functions that are served by each street.

3.1 DESIGN FUNCTIONS

- Within the greater Portland area, every regional street serves more than one function. The following functions describe the typical functions that streets and trails can serve.

Regional streets accommodate regional through trips, local trips and local access. Regional through trips cover longer distances and can require higher travel speeds and less land-use access than local trips. Through trips include transit, motor vehicle and freight trips and longer bicycle trips. Local trips require access and connectivity. Providing for regional through trips, local trips and access distinguishes regional streets from local streets. In the Regional Transportation Plan, regional streets are major and minor arterials and throughways.

The first group of the following functions are divided into two parts – access and mobility. These two terms are frequently used to describe our transportation system, with varying meaning. In the following descriptions:

- "Access" generally refers to the function of allowing a person or good to reach an intended destination.
- "Mobility" generally refers to the movement and travel between two locations that occur on the transportation system.

Pedestrian Access and Mobility: People walking or using a mobility aid

Every street and trail has safe, comfortable space for people walking rolling and enjoying the place they're in.

Serving pedestrians involves both mobility and access functions – and for pedestrians, these functions are complementary.

Safe Access: Walking, or using a personal mobility aid, is a part of every trip. People using transit, driving cars, riding bikes or using other methods of travel still need to walk to the entrance of their destination. This is access. Pedestrian access to places, streets and transit stops must be safe and comfortable. Street crossings, should be frequently located, designed for pedestrian safety and accessible to people with varying abilities. Designs to further enhance pedestrian access include: short signal cycles and other pedestrian-related intersection strategies, accessible, frequent crossings, and pedestrian scale street lighting. Our streets and trails should also provide people with enjoyable pedestrian access to our public space and public places, in all types of Pacific Northwest weather conditions. Building overhangs, shelters and street trees provide protection from rain, snow or extreme heat. Benches, plazas and viewing points provide spaces to pause and rest.

Safe Mobility: Pedestrian mobility means being able to walk or roll, reasonably directly and efficiently, from one place to another. Continuous sidewalks, wide enough to serve all the people using them and buffered from vehicle traffic, provide the primary infrastructure for pedestrians. When appropriate, trails should separate people walking and riding bicycles. Direct routes best serve pedestrian mobility, since walking is a relatively slow method of travel. At intersections, pedestrian crossings should be provided on all sides of the intersection, with few exceptions, to avoid undue out-of-direction travel. Signs and other wayfinding elements along streets and trails support navigation.

Bicycle Access and Mobility: People riding bicycles or other personal mobility devices

Connected bicycle networks, separated from heavy and high-speed vehicle traffic, ensure that bicycling is a great way to get around our communities. The bicycle is the most efficient vehicle invented and has the potential to provide the most cost-effective, healthy mobility option for shorter trips in urban areas. Serving bicyclists and people using other personal mobility devices (such as e-scooters and skateboards, also known as micromobility) requires both mobility and access functions – and for bicyclists, serving each of these functions must be considered distinctly.

Safe Access: People using bicycles need to be able to safely access commercial and community destinations along our streets and trails. Providing access means providing high-quality, comfortable bicycle facilities on streets with higher speeds and motor vehicle volumes and safe crossings and intersections. In some cases, a nearby parallel route such as a low stress bikeway or trail can provide access to destinations, in conjunction with wayfinding and a relatively fine-grained street grid. Convenient, secure and covered bicycle parking is also crucial for providing bicycle access. Bicycle parking should be easy to find and located close to building entrances, especially at major nodes, such as grocery stores, restaurants, schools and employment centers. Bicycle sharing and other shared mobility systems also can provide a convenient option, including for people who do not own or regularly use a bicycle. Street designs should provide adequate space within the right of way for parking of shared bicycles and other shared systems where access is prioritized.

Evolving Functions and emerging technologies

Over the span of human civilization, our streets have served a variety of functions. Principle among these are **mobility** – moving across the land and **access** – being able to reach destinations. How these functions are served has varied substantially over time. Over a century ago, horseback riding, horse-drawn carriages and horse-drawn streetcars served most mobility needs. Hitching posts were a key element of the street design and dealing with horse manure was one of the challenges. Since then, human innovation has produced bicycles, trains and automobiles, transforming street design. *[yes – a sentence or two on street design oriented to motor vehicles and the need to be multimodal].* Today, we are in an era of rapid innovation, evolving technologies and changing demands on our public right of way. As such, the functions outlined in this chapter are meant to be encompassing of these emerging travel methods and uses of the street.

For the purposes of this guide, “bicycles” or “bicyclist” is meant to represent bicycles as well as other travel devices that operate with a relatively similar capacity and speed, including e-bicycles, e-scooters, skateboards and other modes, sometimes referred to as “micromobility.” Motor vehicle typically refers to a personal motor vehicle (i.e. not public transit), and includes all types of motive power (internal combustion, electric, hydrogen fuel cell) and vehicle operator (individual, hired driver, computer).

As our society and technology evolve together, other new functions may be served on our streets. While these new functions may not be included in this edition of Designing Livable Streets, the framework and approach outlined in this guide to serving and designing for key functions can still be applied.

Safe Mobility: A safe, interconnected bicycle network of streets and trails provides mobility throughout the region. The bicycle network should be physically separated from higher speeds and heavy motor vehicle traffic to enable people to move safely and comfortably by bike. When bicycle routes are direct, intuitive and connected, bicycling becomes comparable with motor vehicle travel for relatively short trips, in terms of time. Strategies to enhance bicycle mobility, such as "green wave" signal timing (green signals timed for 12-16 mph speed), can further increase the attractiveness of bicycling as a travel method. Bicycle facility design should also be forward-looking – over the past decades, bicycling in our region has increased substantially – in some places, bicycle lanes or trails are at capacity. E-scooters and e-bikes are further increasing the demand on bicycle facilities. Consider designs that provide significant width for growth in users or that provide flexibility to expand in the future.

Transit Access and Mobility: People accessing and using transit

Our streets enable transit to serve the region with an efficient, reliable way to travel between and within our communities.

Serving transit and the people who ride includes both mobility and access functions – for transit, there are often trade-offs between these two functions but some designs help to maximize both. A frequent, reliable and accessible transit system is one of the most effective uses of the public right of way. Transit can move more people efficiently across the region than any other mode.

Safe Access: Transit access means having a safe and comfortable transit stop near both the beginning and end of a trip – and a safe way to get to and from the stops. Streets should have comfortable, attractive and universally accessible stops connected to quality sidewalks, bikeways and safe street crossings. Transit stops with higher levels of use should have shelter, seating, bicycle parking and potentially real-time information for travelers. At larger stations, include wayfinding for pedestrians and bicyclists, as well as adequate bicycle storage. Transit access can be provided with a range of transit types and services to effectively serve the varied communities in the Portland area.

Safe Mobility: Transit mobility is vital for the efficient movement of people throughout our region. Where possible, exclusive transit right-of-way can provide improved mobility and reliability during times when streets are congested. When transit is traveling in lanes shared with other vehicles, "enhanced transit" strategies can be used to improve mobility by addressing specific locations of recurring delay. These strategies include transit signal priority, business access & transit lanes, stops located on the far side of intersections, and queue jump lanes to bypass traffic at intersections. Even as transit vehicle types and service models evolve (such as driverless vehicles or on-demand routing), high capacity transit on trunk routes will remain critical to providing cost-efficient, space-efficient mobility for people.

Freight Access and Mobility: Moving goods and making deliveries

Key freight corridors provide reliable freight movement, and streets allow delivery access to serve both businesses and residents.

Freight requires both mobility and access functions – but these functions are typically emphasized on different streets and are often served by different types of freight vehicles.

Safe Access: For freight, access means being able to deliver a good to the intended destination. The "last mile" and the "last 50 feet" are the most difficult and costly segments of a freight delivery. Delivery vehicles and workers need safe and reliable space to transfer goods to their point of final delivery, without needing to worry about conflicts from motor vehicles. Designated curb space for freight loading and unloading is necessary in high-traffic commercial zones, and one loading zone can serve multiple businesses. Loading zones can be located on side streets or alleys to reduce conflict with other functions. Often these final deliveries are made in smaller trucks or delivery vans that can navigate narrow streets with relatively tight corners. In locations where larger trucks must make frequent deliveries, ensure street designs that can accommodate them, potentially include truck aprons or mountable curbs. Deliveries can also be made by bicycle, and other wheeled delivery methods (such as self-driving pods) are in development. These methods can put higher demands on sidewalks and bicycle facilities and may necessitate greater widths.

Safe Mobility: Reliable freight movement in the Portland metro area supports businesses and the economy of our region and state. Goods from adjacent farmland and neighboring counties need to reach ports to be exported and sold. High value manufactured goods made within the region often need to be shipped and delivered within a tight time frame. And every day, goods need to be moved through and around the region to be ultimately delivered and distributed to customers. This mobility function is primarily served on key regional freight routes and on industrial routes connecting to manufacturing and industry. Freight is best served with reliable travel times on a system where day-to-day variations are minimized.

Motor Vehicle Access and Mobility: People driving or riding in a motor-vehicle

Our streets and throughways provide for safe, reliable travel in motor vehicles, providing space to facilitate pooled or shared trips.

Motor vehicle travel relies on both access and mobility, but these functions are typically emphasized on different streets. Emphasizing one – either vehicle access or mobility – necessarily means limiting the other. Motor vehicle travel is the most predominant mode of travel in the Portland area and continues to be one of the most convenient ways to travel. As more drivers vie for limited roadway space other modes provide options to driving.

Safe Access: Access for people traveling in motor vehicles is provided with a well-connected network of local and neighborhood streets, driveways to specific destinations, motor vehicle parking and places to drop-off and pick-up passengers. Serving this function on the curbside is typical in centers, where destinations and businesses are clustered. On-street parking also typically provides motor vehicle access, especially in residential areas. The curb will become an increasingly important space for motor vehicles with emerging new technologies. Both ride-sharing and autonomous vehicles will need frequent curbside access to facilitate passenger drop-off and pick-up. These spaces and movements of vehicles should not impede or imperil or people walking, biking or accessing transit. Reimagining street space to reflect future motor vehicle needs must always make safety the top priority.

Safe Mobility: Motor vehicle mobility typically offers time-efficient movement throughout the region. Streets that provide maximum mobility for motor vehicles typically limit access, such as freeways or highways. Other major streets need to balance motor vehicle mobility with other functions. On urban surface streets, intersections are typically one major constraint in terms of providing motor vehicle mobility. Advanced signal timing strategies can help move vehicles through intersections while promoting relatively low vehicle speeds. Roundabouts also provide for efficient, yet low-speed, motor vehicle movement. Managing access – restricting motor vehicle turning movements from side streets and driveways – also promotes safe mobility. As motor vehicle mobility evolves (being increasingly provided by transportation network companies) and vehicles become more automated, people will be able to take advantage of motor vehicle mobility without driving themselves. Providing a reliable level of mobility day-to-day benefits people needing to use motor-vehicles.

Place-Making and Public Space

Our streets and trails are a canvas for our community life and daily commerce, helping to form our regional identity.

Our neighborhoods and cities are built for people and streets represent a large portion of the public space in our communities. They are a canvas for community life, day-to-day social activity, public art, civic debate and joyful celebrations. Our regional streets and trails help form our region's identity and contribute to the unique character of special places within our region. Streets and trails should provide a place for everyone to participate in their community. This is placemaking. Placemaking can achieve several different goals – foster community identity, promote art and local artists, test new public spaces or rebuild a community at a human scale. From outdoor seating and unique wayfinding signage to a redesigned park or art-filled commercial corridor, the ultimate goal is to create more livable communities and celebrate the elements that make this region a great place to live. Deliberate placemaking results in a stronger sense of place and strengthened community bonds ultimately leading towards the regional outcomes we are seeking.

To enhance a placemaking function, street and trail designs can include distinctive features – gateway intersections, aesthetic bridge designs or public art installations highlighting the local community. Designs should also anticipate occasional street use – such as festivals, parades or farmers markets – where the street is closed to through travel during community events.

Corridors for Nature and Stormwater Management

Weaving nature and sustainable stormwater management into our streets and trails enhances livability and protects our water, air and natural assets.

Our natural setting helps make our region great – weaving nature into our streets and trails enhances an already incredible asset. While today's streets are not inherent in nature, they can be designed to protect our water and air and the functions of the natural environment.

Street trees provide a wide array of benefits, contributing to wildlife habitat, improved air quality, pollution reduction, shade, aesthetic beauty, human well-being, traffic calming and reducing stormwater run off. On streets with high levels of walking and bicycling trees can provide buffers from traffic and air pollution.

Streets create stormwater runoff and must be designed to manage both the quantity and quality of stormwater to reduce impacts to natural systems. Green streets design elements – strategies to manage stormwater with vegetation and natural soils – have distinct advantages and co-benefits over purely piped drainage systems. Vegetated medians, planters, curb extensions and other locations can both treat runoff to improve water quality (reduce pollution) and infiltrate water to reduce quantity of stormwater that eventually makes its way into our delicate system of natural waterways.

Designing streets and trails for stormwater management can also incorporate and enhance other functions, such as placemaking. Green street elements can be used to create a stronger sense of place and make walking and biking more enjoyable.

Design of our streets and trails provides an opportunity to conserve, protect, and enhance our natural environment. Sustainable stormwater solutions in the public right of way protect our water quality and critical natural habitats. Street tree canopy can weave access to nature into our urban neighborhoods, creating green corridors for wildlife.

Cities are prominent locations for urban heat islands, where pavement and buildings absorb solar radiation and drive up temperatures. As our climate changes, it is vital to protect and restore nature in our cities to create pleasant outdoor urban spaces and to limit temperature spikes. A dense tree canopy coverage can reduce the urban heat island effect during the summer months.

Utility Corridors

Our transportation corridors move more than just people and goods; they also move water, power, gas, communications, and information.

Street rights of way are often the places that vital utilities are located, such as pipes for water and sewer, power and gas lines, and communications infrastructure. These utilities serve our buildings and land uses, but also serve our streets – powering signal systems, providing street lighting and draining water from the street surface. These utilities have different needs: the water-based utilities use gravity to move and are generally located closer to the curb or the outside travel lane, while the dry utilities, if underground, are usually located in a conduit in the right-of-way at the side of the street. Above ground, they are supported by poles at the side of the street. Street design must provide access to these underground and overhead utilities when repairs are needed. As technology evolves, utility-related demands in street right-of-way will change. Needs for information transmission and sensors will increase – and much of this equipment will be located on utility poles, buildings and within the surfaces of the streetscape. As future smart sensor technology becomes increasingly prevalent, streets should be designed to allow for deployment of sensors that can communicate with a central network. Designs should allow for easy access to sensors to address issues, particularly as yet-to-be-proven technologies are deployed. Working with utility operators to locate underground pipes before an excavation project is vital to avoid line breaks and other issues – and is codified into state law.

Physical Activity

Our streets and trails are places where people enjoy exercising and spending time outdoors whether for recreation or to get to where they need to go.

When safe and comfortable, our streets and trails provide people with a place to recreate and get exercise as part of their daily activities. They should provide truly enjoyable spaces, considering safety, shade, sun, seasons and an engaging sensory experience. Spaces that mitigate impacts from noise, heavy motor vehicle traffic and pollution can encourage people to stroll, jog, bicycle, roll or skate, simply for the joy and benefit of being active outdoors. Many people in our region use our streets to move, exercise and enjoy being outdoors, whether strolling, jogging, bicycling, rolling or skating. Street trees provide protection from sun and rain. Street lighting makes evening or early-morning activity possible. And continuous, comfortable walking and bicycling infrastructure is vital for this function.

Physical activity is better served by streets and trails where the negative impacts of motor vehicles are mitigated with designs that reduce noise impacts, provide a buffer between moving vehicles and minimize pollution effects. These spaces will invite people out simply for the joy of being active outdoors and will reap tremendous community health benefits.

Emergency Response

In case of a local or widespread emergency, our streets and throughways must provide access and evacuation routes to keep people safe.

From local emergencies, such as single-alarm fires, to regional crises, such as a Cascadian subduction zone earthquake, our streets are the lifeblood for any response. Our first responders and emergency vehicles need space to operate and deploy resources on our streets to respond to various needs in an emergency.

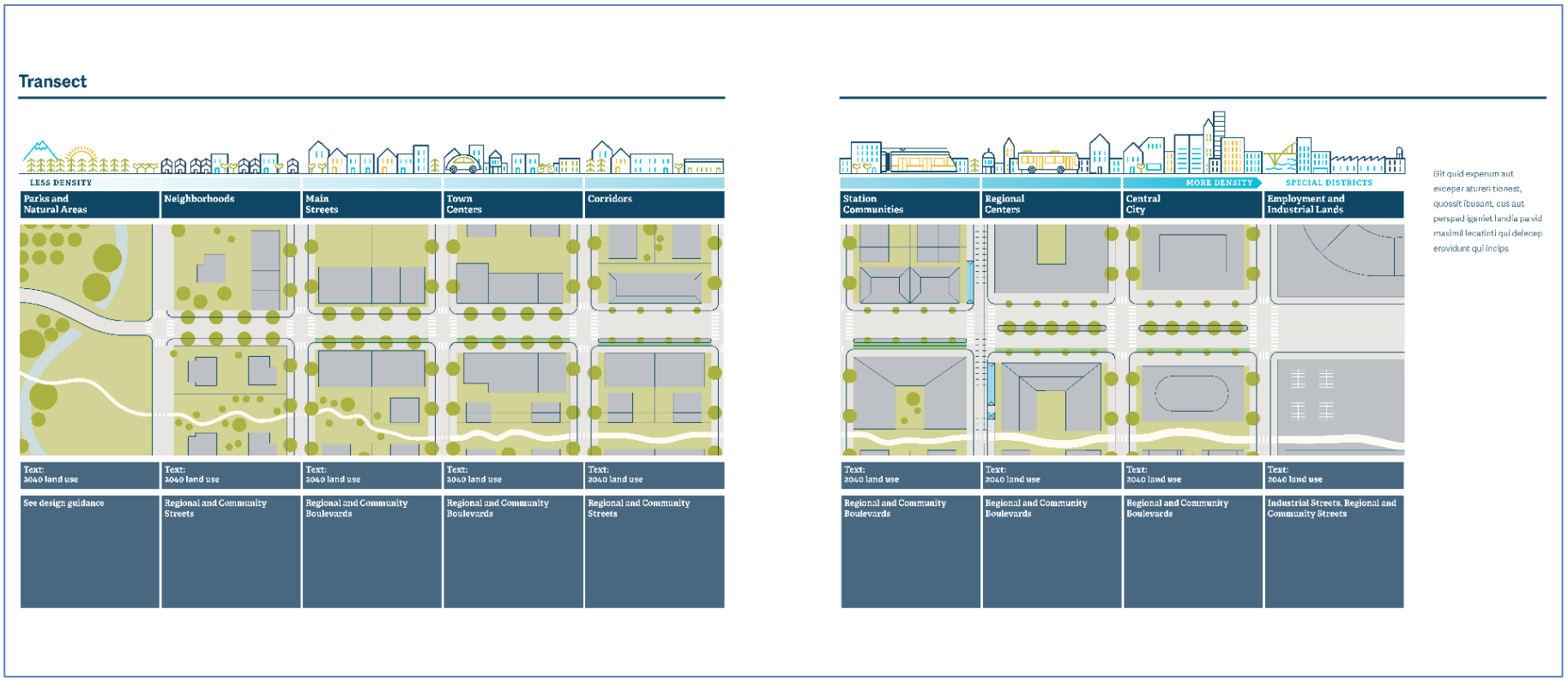
Designs must consider emergency vehicle access needs. Vertical elements like speed bumps should not be used on primary emergency routes, and streets must have sufficient clear width for emergency vehicles to deploy life-saving equipment. In some areas, regional trails and bicycle and pedestrian bridges can serve as additional access routes for emergency vehicles and bicycle emergency services for big events such as an earthquake.

3.2 REGIONAL STREET DESIGN CLASSIFICATIONS

A classification is a formal designation of a street that determines how that street is handled in a range of processes such as roadway design, traffic operations or funding eligibility. The traditional classification system for streets is the "functional classification" which is typically determined by motor vehicle travel speed, motor vehicle capacity (number of lanes) and whether the street is in an urban or rural area. This traditional system is limited in that it does not take into consideration other functions of the street such as other travel modes, especially bicycling and walking, or the specific role the street serves for surrounding and planned land uses, which varies in urban areas. A street classification system that balances the needs and safety of all users, including pedestrians, transit riders and bicyclists, and serves the current and planned uses of and contexts of adjacent properties can be referred to as a "design classification."[1]

[1] Refer to NCHRP Research Report 880 "Design Guide for Low-Speed Multimodal Roadways" (2018) for a national perspective on developing best-practice design guidance and a new approach to classifying roadways with 45 mph and lower design speeds.

Metro developed regional street design classifications and adopted them into the Regional Transportation Plan in the mid1990s to specifically link land use context and transportation design, to support the range of transportation needs of the different land use types identified the Region 2040 Growth Concept. **Figure XX** illustrates the relationship between the 2040 land use types and the regional street design classifications. As indicated in the illustration, freeways, highways and trails can serve all land use types.



In addition to design classifications, the Regional Transportation Plan includes functional classifications for the different modal networks in the plan: pedestrian, bicycle, transit, freight and motor vehicle. The different modal networks are primarily assigned to the same network of regional streets comprised of major and minor arterials and throughways. The transit network includes some local collector streets and the pedestrian and bicycle networks include regional trails and some local streets. The modal classifications provide policies for the design and function of streets to serve the specific needs of each mode of travel.

While focused on 2040 land use, regional street design classifications are also informed by the modal network classifications and provides typical design components to balance the different functions inherent in each. Regional design and functional classifications apply to local transportation system plans in the greater Portland area. Cities or counties typically adopt the classifications as-is into their plans, or provide a cross-walk if they use different terms for the classifications.

Regional street design classifications are assigned to all throughways and major and minor arterials on the regional transportation system. While the design classifications described below are only applied to arterials and throughways, the design elements and guidance in this guide can easily be applied to any street or trail. Regional street design classifications provide general design guidance that is based on the current and planned land use context, modal functional classifications and the design principles described in Chapter 4:

- applying a safe systems approach;
- applying lower target speeds on streets where people walk, bike and access transit and aligning design speeds to match the target speed;
- designing streets for all ages and abilities and typical vehicles;
- street and network connectivity;
- applying flexibility in design;
- protecting the environment;
- and using emerging technologies to design for the future we want.

The regional street design classifications fall under the following categories:

- **Freeways and highways** are limited access designs that prioritize long-distance freight, motor vehicle and transit mobility across the region and beyond.
- **Regional and community boulevard** classifications apply to 2040 centers, station communities and to main streets. Boulevard designs serve major centers of urban activity and emphasize access and mobility for public transportation and people walking and bicycling.
- **Regional and community street** classifications apply to 2040 corridors, main streets, industrial and employment areas and neighborhoods with designs that integrate all modes of travel and provide accessible and convenient pedestrian, bicycle and transit travel.
- **Industrial streets** classifications apply to intermodal facilities such as airports, and to 2040 industrial and employment areas. These designs primarily serve freight mobility and access while safely integrating multi-modal travel and access to transit.

While the design classifications differ based on purpose and design emphasis required to support the 2040 Growth Concept land use components, some design elements are shared by all of the design classifications. These include:

- **Green infrastructure:** Due to the wider width of regional streets, a higher capacity swale should be used to accommodate runoff from the larger collection area, or street tree wells and infiltration trenches. Swales can be located in the central median or a side median adjacent to a local access street. Medians, planted pedestrian buffers, pervious pavement treatments and other efforts reduce the amount of impervious surfaces. Light pollution should be minimized to increase safety and protect wildlife.

- **Utilities:** Many utilities use the roadway corridor. Wherever feasible utilities should be placed underground, especially on regional and boulevards and streets. Underground utilities can reduce the severity of motor vehicle crashes, free up pedestrian space, enhance the visual aesthetics of the street, eliminate need for most tree trimming and are not as vulnerable to extreme weather events. As new technologies emerge, the demand for space on streets, especially within the pedestrian realm will increase. Design solutions to maximize space and minimize visual clutter should be considered in every design process.

The following describes the purpose, function and land use relationships for each regional street design classification.

Freeways and Highways

Freeways and highways connect major activity centers within the region, including the central city, regional centers, industrial and employment areas and intermodal facilities such as the Port of Portland. Freeways and highways provide inter-city, inter-regional and inter-state connections. The freeway and highway design classifications are assigned to streets with the throughways functional classification in the Regional Transportation Plan. All throughways are identified as primary regional freight routes.

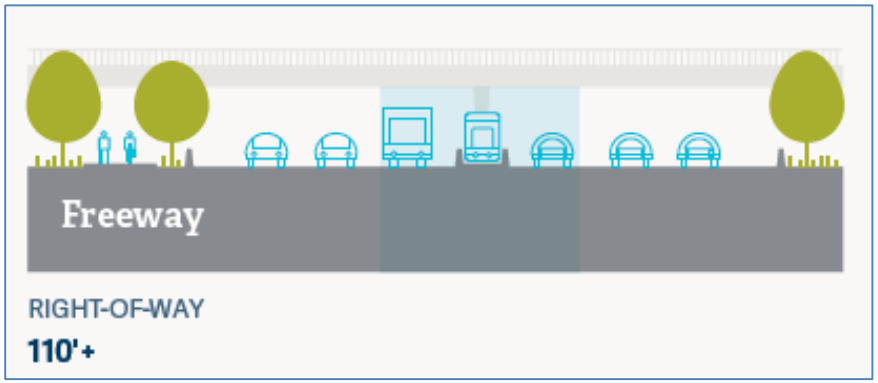
Freeway and highway design prioritizes long-distance freight, motor vehicle and transit mobility. The limited access, divided freeway and highway design supports higher travel speeds, ranging from 35 to 60 mph. Some lanes may be dedicated to high-occupancy-vehicle, freight-only or transit-only travel to support more efficient use of the facilities. Freeways and highways are designed to serve an important emergency response function and are identified as primary emergency response routes. While the design of freeways and highways supports mobility for freight, transit and long distance motor vehicle trips, the design also disrupts connectivity of the street network, trails and wildlife corridors. Providing for connectivity across these facilities for people and wildlife is essential.

Freeway and highway designs typically do not include place-making or public space features. However, some design elements can enhance freeways and highways, such as incorporating view sheds of natural features, murals or greening of sound walls, gateway treatments on bridges and light rail stations and lighting features. If the parkway design overlay applies, the scenic beauty of the corridor is enhanced with parkway design elements. If light-rail is part of the corridor, station treatments can create public space.

Green infrastructure is a critical design element for freeways and highways to mitigate the negative impacts of motor vehicles and enhance the travel experience. Boswales and continuous landscaping along the freeway or highway and in medians, while maintaining clear sightlines, supports filtration and retention of stormwater runoff, and provide noise and pollution mitigation. Light pollution should be minimized to increase safety and protect wildlife. Fish passage must be addressed when the freeway crosses fish bearing streams. Freeway and highway corridors are also important utility corridors. Wherever feasible utilities should be placed underground.

Freeways

Freeways typically consist of six vehicle travel lanes, with additional auxiliary lanes in some cases. The right of way typically ranges from 110 feet or greater. Freeways are completely divided, prohibiting access and turning movements except at grade-separated interchanges. Medians can serve as a corridor for light-rail or can be planted with trees or plants that do not attract wildlife. Bicycle and pedestrian travel should not be located in the median area. Interchanges for freeway design should be spaced no more frequently than every two miles. Interchanges are transition zones and are designed for lower speeds and safety for all modes, including bicyclists and pedestrians. Freeways cross all types of land uses and buildings are not oriented to these facilities. Figure X illustrates a typical cross-section of a freeway design. The blue highlighted areas indicate optional design elements depending on right of way availability and prioritized functions.



Freeways include a shoulder that is primarily used for emergency stops and crash recovery, but can be flexed for other purposes. Emergency vehicles may use the shoulder to bypass traffic. Shoulders can also be converted to support bus-on-shoulder use or high-occupancy vehicle lanes. Parking is prohibited on freeways.

Multimodal or pedestrian and bicycle crossings are provided on overpasses or underpasses, and should be spaced no less than one mile apart, with more frequent crossings in denser areas. Wildlife crossings should be considered depending upon the location. There is no pedestrian and bicycle access to freeways. Pedestrian and bicycle mobility is provided on separate facilities, often a multi-use path or streets parallel to the freeway, separated by a sound wall and trees.

Highways

Highways consist of four to six vehicle travel lanes, with additional lanes in some cases. The right of way typically ranges from 100 to 135 feet or greater. Highways are usually divided with a median, but may have left-turn lanes where at-grade intersections exist. Medians can serve as a corridor for light-rail or can be planted with trees or plants that do not attract wildlife. Bicycle and pedestrian travel should not be located in the median area. Highways may have more street connections than freeways, but connections should be minimized. Street connections occur both at-grade or grade-separated. Land-use access is typically restricted, with few buildings facing highways. If buildings are present they are typically on a deep set-back. Figure X illustrates a typical cross-section of a highway design.

Highways typically include a shoulder that is primarily used for emergency stops and crash recovery, but can be flexed for other purposes. Emergency vehicles may use the shoulder to bypass traffic. Shoulders can also be converted to support bus-on-shoulder use or high-occupancy vehicle lanes. Parking is prohibited on freeways. On-street parking is usually prohibited along highways.

Intersections are designed for lower speeds and safety for all modes. Pedestrian and bicycle crossings are provided should be either grade separated or signalized intersections with protected crossing treatments for the highway design. Where street connections are further than one mile apart pedestrian and bicycle crossings should be provided in denser areas. Wildlife crossings should be considered as part of the design depending on the location. Highway designs include protected bikeways and sidewalks with a wide landscape buffering or a parallel multi-use path.

Regional and Community Boulevards

Boulevards are the continuation of regional street network and serve the multimodal travel needs of the region's most intensely developed and developing activity centers, including the central city area of Portland, regional centers, station communities, town centers and some main streets. Boulevards. The regional and community boulevard design classifications are applied to major and minor arterial streets in the Regional Transportation Plan. Boulevards consisting of paired one-way streets or couplets, are spaced no greater than one block apart. This design is used to increase capacity of intensely developed commercial areas. Each street might have two to three travel lanes and include all of the design elements of a boulevard except the median. The regional boulevard classification is applied to major arterials and the community boulevard classification is applied to minor arterials. In the greater Portland metropolitan area, several regional boulevards are also state highways.

Adjacent land uses and buildings orient directly to the boulevard with ground-floor commercial activity, contributing to pedestrian friendly environment. Buildings typically have designs that provide transition spaces from the street and support pedestrian access, such as a storefront or arcade.

Boulevards are designed with elements that promote safe and comfortable travel for all modes. Pedestrian mobility and access are prioritized, as is access to transit. Some boulevards are also identified as bicycle parkways, frequent bus routes or enhanced transit corridors; in these instances mobility for these functions may be enhanced through design. Boulevards are important roadways for motor vehicle and freight travel. Mobility for motor-vehicle and freight travel is slower due to lower speeds and increased levels of activity. Some boulevards are identified as primary emergency response routes and will include designs to allow emergency vehicle access and travel.

Boulevard design supports low travel speeds for vehicles, typically 20 to 25 mph, to increase safety for all modes and accommodate the higher levels of pedestrian activity. Signal timing can be used to support slower speeds that keeps traffic moving. One of the predominant safety and livability features of boulevards is the use of a raised landscaped median with large, broad canopied and long lived street trees. In some cases where right of way is

limited, a narrow landscaped median may be used. In conjunction with wide sidewalks that also include street trees, the median functions as a pedestrian refuge, limit head on motor vehicle crashes and to provide a sense of enclosure to calm traffic speeds. Access control is a secondary benefit.

Boulevards have many street connections, but are typically access managed with few driveways that are combined when possible. Pedestrian and bicycle crossings should be signalized and enhanced. Safe, direct and logical pedestrian crossings are provided at all transit stops. Wildlife crossings should also be considered depending on the location. Fish passage must be addressed when the roadway crosses fish bearing streams.

Pedestrian access is supported by ADA accessible sidewalks and curbs, way finding and places to stop and sit. Pedestrian access to transit is supported by transit stops with features including shelter, seating and travel information. Bicycle access is supported by bicycle parking, way finding and connections to other bicycle routes. Freight access may be provided in the center travel way, curb side or on side streets.

Pedestrian mobility is served with wide, buffered sidewalks. Bicyclist mobility is served with protected bikeways. If a protected bikeway is not possible or desirable then a low stress facility is provided on a parallel facility no less than one block over. Wayfinding, visual cues and bicycle parking connect bicyclists from the low stress bikeways to the commercial and community destinations along the boulevard.

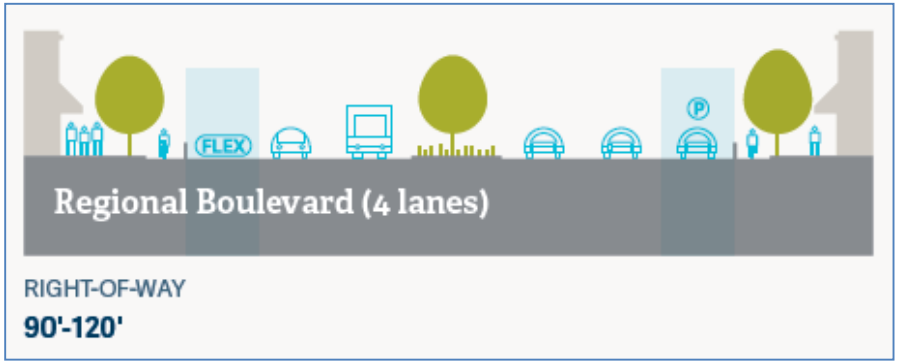
On boulevards, the flex zone (sometimes referred to as the parking lane) is in high demand because of the level of activity and intensity of uses in centers, station communities and along main streets. In some cases, due to space constraints, the flex zone may be dedicated to a travel lane or bus only lane. Other uses may include drop-off and loading zones, bikeways, bulb-outs for in lane transit loading, green streets treatments or motor vehicle, e-scooter and/or bicycle parking, which can provide a buffer for pedestrians and access to businesses. Parking for motor vehicle and bicycles is typically desirable in boulevards due the high level of commercial activity.

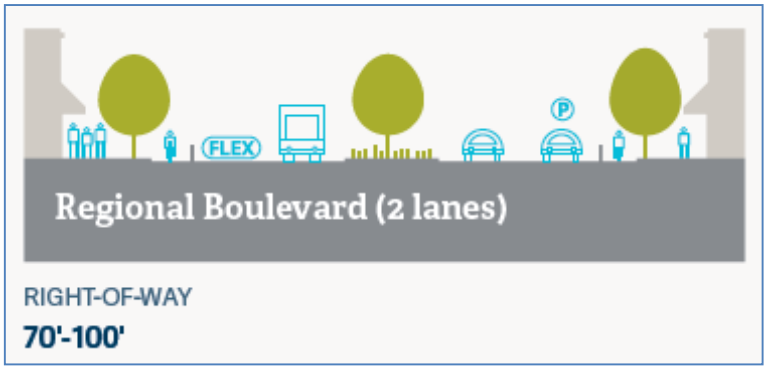
Boulevard design incorporates place-making and public space in many ways. Boulevards are centers of activity and often the heart of the community. Public art and designs that reflect the history and culture of the community are desirable. Building design, treatments to street lighting, wayfinding, pavement and landscaping create a sense of place. Many jurisdictions have special design codes for streets within centers and station communities.

Regional Boulevards

Regional boulevards consist of up to four vehicle travel lanes, balanced multimodal function and a broad right of way. Regional boulevards include medians that serve as a pedestrian refuge at street crossings. Pocket turn lanes are typically included in the design. Road reconfigurations from four to three lanes may add a turn lane and parking and/or bicycle facilities if those do not exist. The right of way typically ranges from 70 to 120 feet or greater.

Figures x and x illustrate typical cross-sections of two-lane and four-lane regional boulevards. The blue highlighted areas indicate optional design elements depending on right of way availability and prioritized functions.





Landscaped medians planted with trees are an essential element of the boulevard design. Medians and access management increase safety for pedestrians and all modes. The double median (or "Parisian boulevard") is another type of regional boulevard that has a central roadway for through traffic separated on either side from local traffic and pedestrian and bicycle travel by tree-lined medians. This type of boulevard has a minimum right of way width of 100 feet, a functional minimum width of 110 feet, and an ideal width of 132 feet or greater.

Community Boulevards

Community boulevards typically have a narrower right of way than regional boulevards and generally consist of two vehicle travel lanes, though can sometimes go up to four travel lanes. Community boulevards may or may not have turn lanes. Road reconfigurations from four to three lanes may add a turn lane and parking and/or bicycle facilities. The right of way ranges from 60 to 80 feet or greater. Figure X illustrates the typical cross-section of a community boulevard. The blue highlighted areas indicate optional design elements depending on right of way availability and prioritized functions.

Regional and Community Streets

Regional and community streets balance the multimodal travel and access needs of corridors, neighborhoods and some main streets and employment and industrial areas. Streets are typically more vehicle-oriented than boulevards, while integrating all modes of travel and designed as complete streets. Transit and bicycle mobility are also prioritized on regional and community streets, especially when those streets are frequent bus routes, enhanced transit corridors and/or bicycle parkways. Some boulevards are identified as primary emergency response routes and will include designs to allow emergency vehicle access and travel. Where regional streets are also roadway connectors on the regional freight network, freight mobility and access is also prioritized. Regional or community streets consisting of paired one-way streets or couplets, are spaced no greater than one block apart. This design is used to increase capacity of intensely developed commercial areas. Each street might have two to three travel lanes and include all of the design elements of a boulevard except the median. The regional and community street design classifications are applied to major and minor arterial streets in the Regional Transportation Plan. The regional street classification is applied to major arterials and the community street classification is applied to minor arterials.

Regional and community streets are located within residential neighborhoods to more densely developed corridors and employment centers where development is set back from the street. Regional and community streets can be within main streets where buildings are oriented toward the street at major intersections and transit stops.

The regional and community street design supports low to medium travel speeds for freight, transit and motor vehicles, typically 20 to 30 mph. Greater separation for people bicycling and walking is needed when speeds are higher. Signal timing can be used to support slower speeds that keeps traffic moving. One of the predominant safety and livability features of regional and community streets is the use of a raised median. Regional and community streets can have three different median conditions, depending on the intensity of adjacent land use and site access needs:

- Raised landscaped median. Used along corridors, main streets and station communities where driveways are frequent and where average daily traffic exceeds 28,000 vehicles.
- Narrow landscaped median. Used to restrict turning movements and reduce conflicts along corridors, main streets and station communities. Used where site access is provided from side streets or U-turns are permitted at frequent intervals, and the curb-to-curb width is greater than 50 feet.
- No median. Used within neighborhoods, corridors and main streets where site access is less frequent and can be provided without a median or left-turn lanes and without significantly impacting capacity.

On regional and community streets, parking is less desirable than on boulevards. In some cases, due to space constraints and mobility demands, parking may be prohibited and the flex zone may be dedicated to a travel, bus-only lane (with bulb-outs for in-lane boarding) and/or protected bikeway. Other uses include green streets treatments or motor vehicle, e-scooter and/or bicycle parking, which can provide a buffer for pedestrians and access to businesses.

Regional and community street design incorporates place-making and public space in many ways. Transit stops and major intersections can serve as anchors along street corridors. Public art and designs that reflect the history and culture of the community are desirable. Building design, treatments to street lighting, wayfinding, pavement and landscaping create a sense of place. Many jurisdictions have special design codes for streets within centers and station communities.

Regional Street

Regional streets typically consist of up to four travel lanes, with a median and turn lanes and have a broad right of way. Some lanes may be dedicated to transit only lanes or to protected bicycle facilities to support multimodal travel. Road reconfigurations from four to three lanes may add a turn lane and parking and/or bicycle facilities. The right of way ranges from 80 to 100 feet or greater. Figures x and x illustrate the typical cross-sections of a two-lane and four-lane regional streets. The blue highlighted areas indicate optional design elements depending on right of way availability and prioritized functions.

Community Street

Community streets typically have a narrower right of way and fewer travel lanes than regional streets. They generally consist of two vehicle travel lanes, though can sometimes go up to four travel lanes. Community streets may or may not have turn lanes. Road reconfigurations from four to three lanes may add a turn lane and parking and/or bicycle facilities. The right of way ranges from 60 to 80 feet or greater. Community streets provide a higher level of local access and street connectivity than regional streets. Community streets have the greatest flexibility in cross sectional elements. Some lanes may be dedicated to transit only lanes or to protected bicycle facilities to support multimodal travel. Road reconfigurations from four to three lanes may add a turn lane and parking and/or bicycle facilities. Figure x illustrates a typical cross-section of a community street. The blue highlighted areas indicate optional design elements depending on right of way availability and prioritized functions.

Industrial Streets

Industrial streets serve low-density industrial and employment areas and intermodal facilities where buildings are seldom oriented to the street. The industrial street design classification is typically applied to major or minor arterial roadways in the Regional Transportation Plan that connect to intermodal facilities (airports, rail stations, marine terminals and rail yards) or are in 2040 industrial and employment areas. The right of way typically ranges from 60 to 90 feet. Figure x illustrates a typical cross-section of an industrial street design. The blue highlighted areas indicate optional design elements depending on right of way availability and prioritized functions.

Industrial streets prioritize heavy truck mobility and access while providing for safe transit, bicycle and pedestrian access and travel. While pedestrian and bicycle demand will typically be lower in these areas the need for safe access to transit and bikeways increase access to jobs. Additionally many freight oriented land uses connect to regional destinations such as parks and natural areas or border neighborhoods and centers which attract multimodal trips.

Industrial streets typically have two to four travel lanes with turn lanes. Additional lanes are appropriate in some situations. Travel lane widths are generally wider in industrial streets. Medians increase safety. Industrial street design can support low to higher travel speeds for freight, transit and motor vehicles, ranging from 20 to 40 mph, depending on the specific local context. Greater separation for people bicycling and walking is needed when speeds are higher.

Industrial streets serve as primary freight routes and often include specific design treatments to improve freight mobility. Industrial streets have some street connections and few driveways. Street corners with larger turning radii improve truck mobility and access. Truck aprons or roundabouts can be used in some contexts to slow vehicle speeds and increase safety. Industrial streets rarely include on-street parking. Industrial streets are designed for

through service transit with some transit stops. The flex zone may be dedicated to travel lanes, bus and freight only lanes or protected bikeways. A center median serves to reduce conflicts and restrict turning movements except at intersections. Pedestrian and bicycle crossings are included at intersections. Pedestrian travel is accommodated on a sidewalk with buffer or a parallel multi-use path. Bicycle travel is provided on a protected bikeway, multi-use path or on a parallel street.

Parkway Design Overlay

A design overlay can be applied to roadways in undeveloped areas including parks, natural areas, open spaces and scenic areas, rivers and streams, wetlands and floodplains. Parkways serve as linear parks and often have a parallel multi-use path. They are designed to protect, preserve and enhance the natural environment and natural features. They may connect important natural features. Travel speeds are slower, no higher than 45 mph, and access is limited. They are typically not commercial or freight routes. Wide green buffers separate the roadway from buildings and development. Special design of railings, lighting and way finding may be applied to emphasize the Parkway elements.

Regional Trails

Regional trails, or multi-use paths, are not included in the regional street design classifications, just as local streets that might serve as a regional bikeway are not included. However regional trails are a critical part of the regional pedestrian and bicycle networks and their design consider not only the local context but also the various functions that they serve. Bicycle and pedestrian facilities may transition from a multi-use path to on-street designs and back to a path. For these reasons, regional trails are addressed in this section.

Regional trails can traverse any type of land use. They are often situated in riparian corridors, rail corridors or utility corridors. However they can just as likely be situated within the road right of way, as in a freeway or highway corridor. Or, a regional trail may transition to an “on-street connection” where it might be designed as a protected bikeway and sidewalk buffered by street trees. Whatever the location or design, trails provide for comfortable and safe pedestrian and bicycle travel.

Within the urban area, multiple access points to trails increase security and access to destinations. Street crossings for trails should be enhanced for safety. Depending on the travel volumes of both the trail and the street the enhanced crossing might prioritize trail users with activated signals.

Trails, especially bridges over rivers or throughways, can serve as emergency vehicle routes. They can also serve as utility corridors. When in natural areas they must be designed to avoid, minimize and mitigate impacts on the environment. In some instances there will be opportunities to restore degraded landscapes and provide improved access to natural areas.

Table X illustrates which mobility, access and other functions are typically prioritized or accommodated on the different street design classifications and on regional trails. As mentioned elsewhere in this guide, no two streets or trails are the same. As such, no one set design will fit every street and trail, and each function will not be served in the same way on each street or trail.

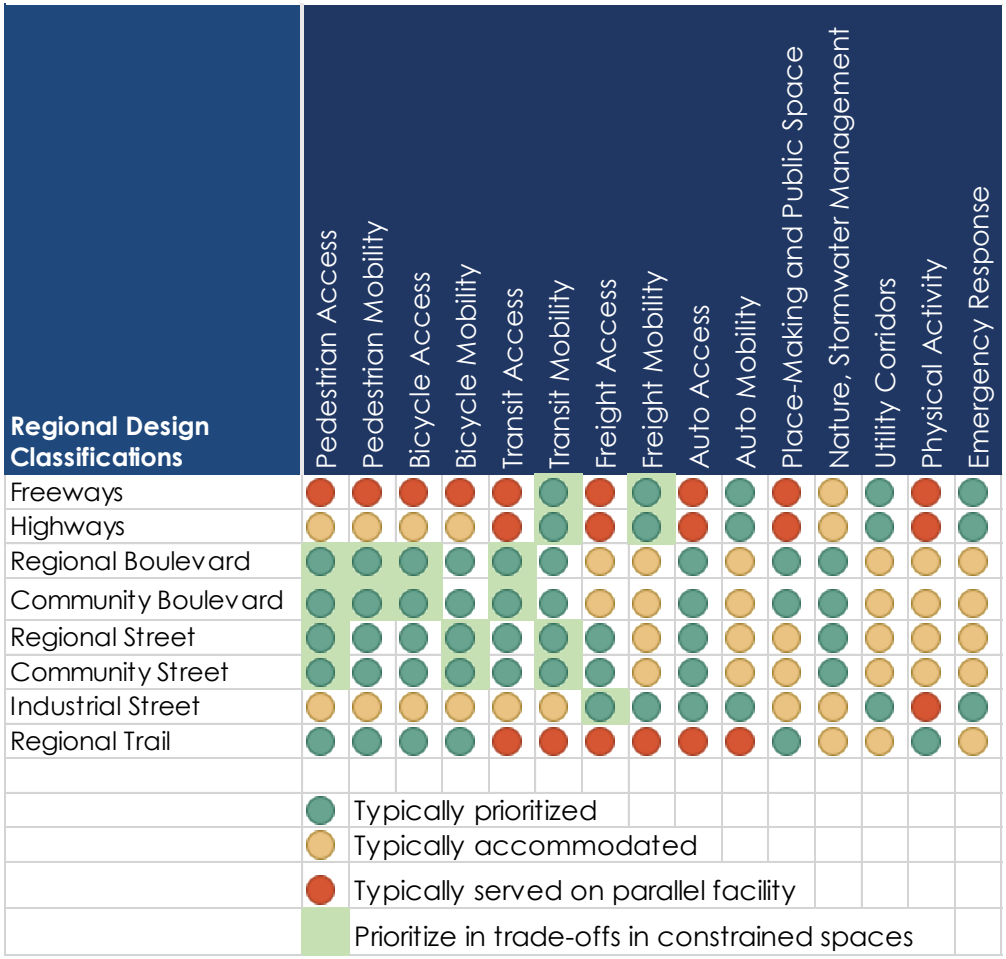


Table X summarizes the general street design classification components for each of the street design classifications described above.

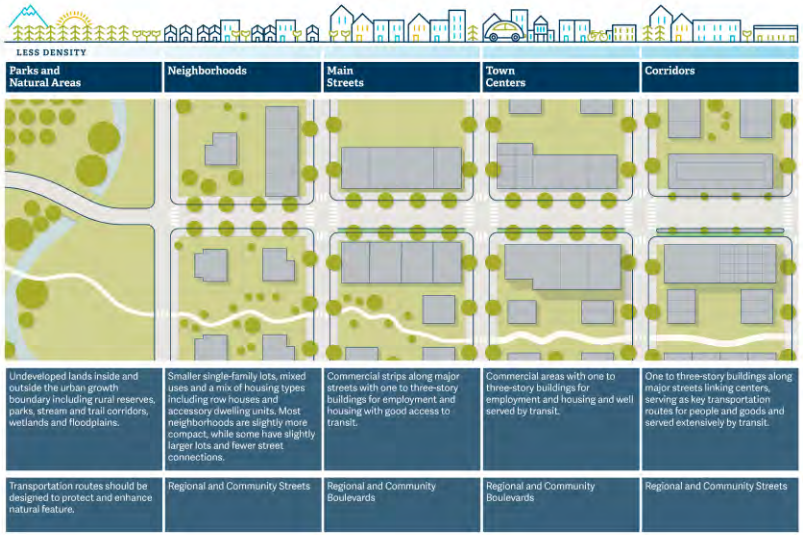
Design Classification	Prioritized modes of travel	Land use context	Street connections	Target/ design speed	Number of travel lanes	Medians and turn lanes	Flex-zone/parking	Pedestrian design	Bikeway design	Transit design	Freight design
Freeways	Motor-vehicle, freight, transit	Any	Limited, grade separated	45 to 60 mph	Six with auxiliary lanes in some places	Barrier with shoulders No turn lanes	Shoulder for safety, emergency use, bus on shoulder or HOV	Parallel facility Crossings on over or underpasses	Parallel facility Crossings on over or underpasses	Bus-on-shoulder, express bus, light-rail	Enhanced mobility
Highways	Motor-vehicle, freight, transit	Any	Limited, some at grade, signalized	45 to 60 mph	Up to six with auxiliary lanes in some places	Median Limited turn lanes in some locations.	Shoulder for safety, emergency use, bus on shoulder or HOV	Parallel facility Crossings on over or underpasses	Parallel facility Crossings on over or underpasses	Bus-on-shoulder, express bus, light-rail	Enhanced mobility
Regional Boulevard	Pedestrian, transit, bicycle Access for the above and auto	Centers, station communities and some main streets	Many; access management emphasized	20 to 25 mph	Up to four lanes	Median Some turn lanes	Parking, green streets, protected bikeway, enhanced bus, etc.	Wide sidewalks with buffer Enhanced crossings and access to transit	Protected bikeway unless on parallel facility Enhanced crossings	Enhanced stations, priority bus treatments on ETC routes	Loading and unloading; Truck aprons
Community Boulevard	Pedestrian, transit, bicycle Access for the above and auto	Centers, station communities and some main streets	Many; access management emphasized	20 to 25 mph	Two to four lanes	Median Some turn lanes	Parking, green streets, protected bikeway, enhanced bus, etc.	Wide sidewalks with buffer Enhanced crossings and access to transit	Protected bikeway unless on parallel facility Enhanced crossings	Enhanced stations, priority bus treatments on ETC routes	Loading and unloading; Truck aprons
Regional Street	Pedestrian, transit, bicycle Access for all modes	Corridors, neighborhoods, some main streets and employment and industrial areas	Some to many; access management emphasized	20 to 30 mph	Up to four lanes	Median Some turn lanes	None, or parking, green streets, protected bikeway, enhanced bus, etc.	Wide sidewalks with buffer Enhanced crossings and access to transit	Protected bikeway unless on parallel facility Enhanced crossings	Enhanced stations, priority bus treatments on ETC routes	Loading and unloading
Community Street	Pedestrian, transit, bicycle Access for all modes	Corridors, neighborhoods, some main streets and employment and industrial areas	Some to many	20 to 30 mph	Two to four lanes	Median Some turn lanes	None, or parking, green streets, protected bikeway, enhanced bus, etc.	Wide sidewalks with buffer Enhanced crossings and access to transit	Protected bikeway unless on parallel facility Enhanced crossings	Enhanced stations, priority bus treatments on ETC routes	Loading and unloading
Industrial Street	Motor-vehicle, freight, transit	Employment and industrial areas; Intermodal Connectors on freight network	Some; access management emphasized	20 to 40 mph	Two to four lanes	Median Some turn lanes	None, or parking, green streets, protected bikeway, enhanced bus, etc.	Sidewalk with buffer or multi-use path Enhanced crossings and access to transit	Protected bikeway unless on parallel facility, or multi-use path Enhanced crossings	Accessible stations, priority bus treatments on ETC routes	Priority freight treatments, wider lanes and intersections

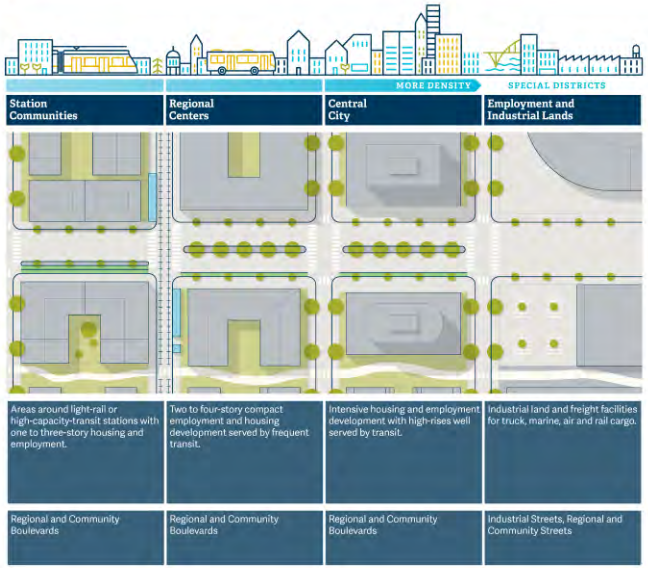
Design decisions are guided by desired policy outcomes/design principles

Attachment 4

Street design corresponds to land use

Metro Land-Use and Transportation Transect





Regional street design classifications support multimodal travel and the specific transportation needs of the 2040 Growth Concept land use types. Local streets serve all land use types. Freeways and highways can traverse any type of land use.

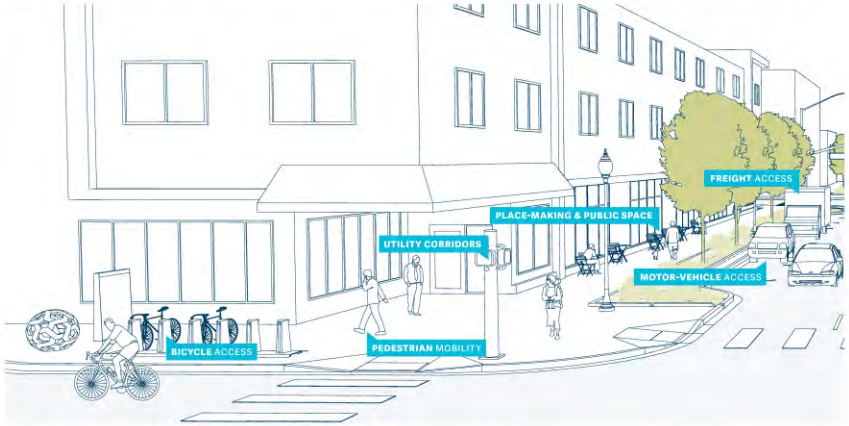
Draft

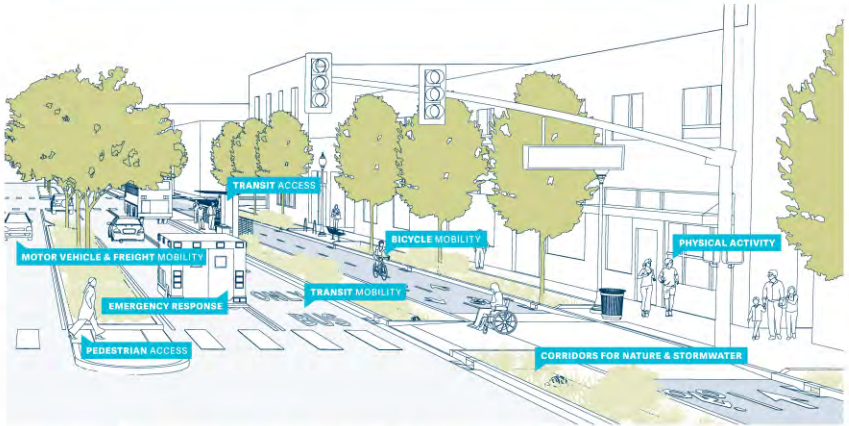
Attachment 4

Design serves the different functions of streets

Desired functions are identified in modal plans and adopted policies

Livable Street Functions





Pedestrian
ACCESS & MOBILITY

Every street and trail has safe, comfortable space for people walking, rolling, and enjoying the place they're in.

Bicycle
ACCESS & MOBILITY

Connected bicycle networks, separated from hehavy vehicle traffic, ensure that bicycling is a great way to get around in our communities.

Transit
ACCESS & MOBILITY

Our streets enable transit to serve the region with an efficient, reliable way to travel between and within our communities.

Freight
ACCESS & MOBILITY

Key freight corridors provide reliable freight movement, and streets allow delivery access to serve both businesses and residents.

Motor-vehicle
ACCESS & MOBILITY

Our transportation system provides for safe, reliable travel in motor vehicles, providing space to facilitate pooled or shared trips.

Place-making & Public Space

Our streets and trails are a canvas for our community life and daily commerce, helping to form our regional identity.

Corridors for Nature & Stormwater

Weaving nature and sustainable stormwater management into our streets and trails protects and enhances our region's natural assets.

Utility Corridors

Our transportation corridors move more than just people and goods; they also move water, power, gas, communications, and information.

Physical Activity

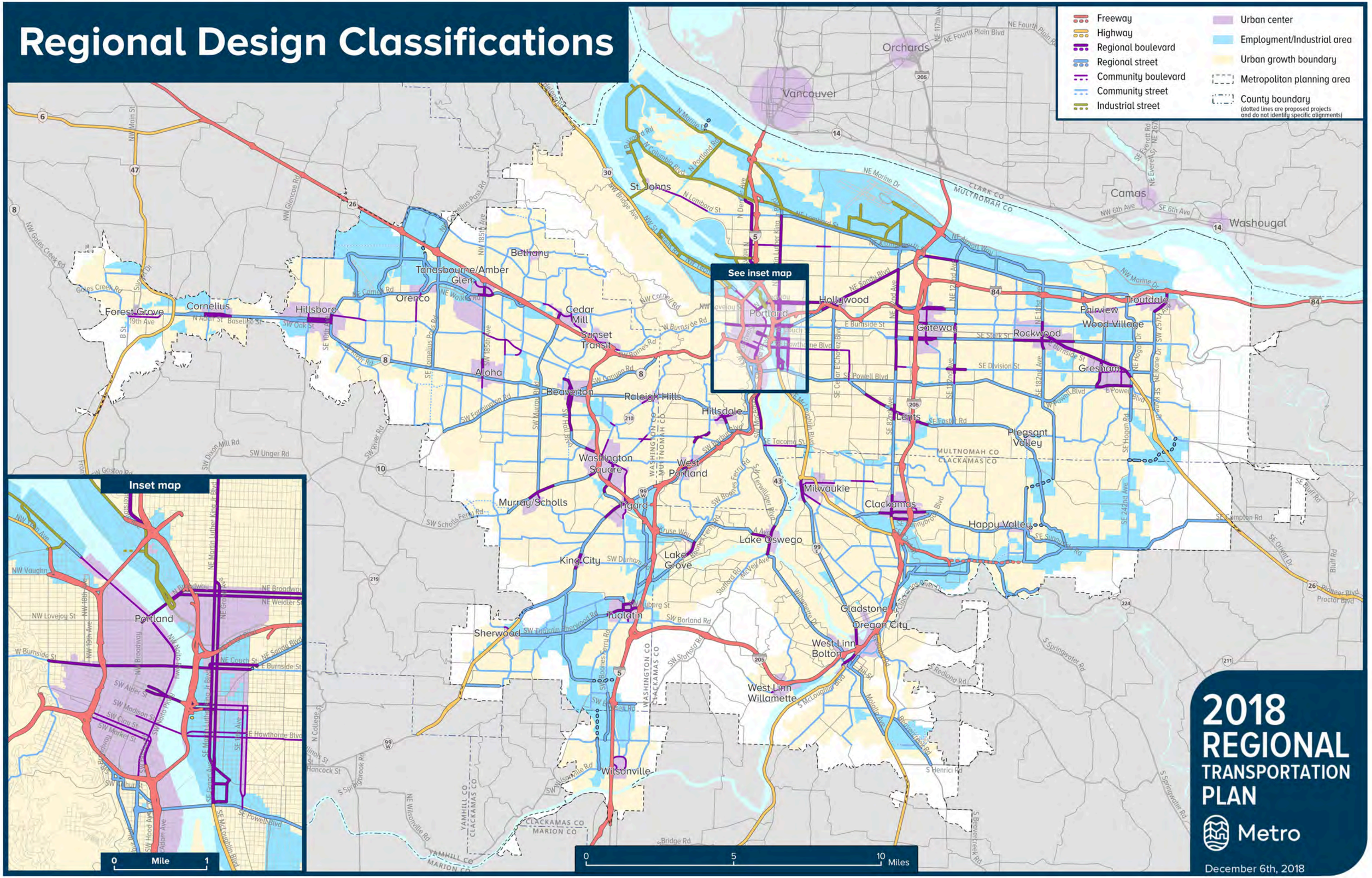
Our streets and trails are places where people enjoy spending time outdoors as part of an active lifestyle.

Emergency Response

In case of a local or widespread emergency, our streets must provide access and evacuation routes to keep people safe.

Draft

Regional Design Classifications



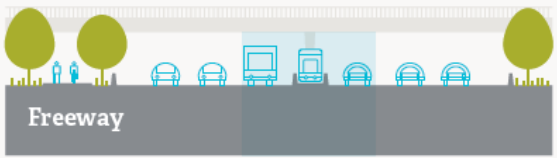
2018 REGIONAL TRANSPORTATION PLAN

Metro

December 6th, 2018

Regional street design classifications

Using outcomes – such as reducing greenhouse gases or increasing safety - to determine how to best allocate space and design our streets



RIGHT-OF-WAY
110'+

RIGHT-OF-WAY
90'-120'

RIGHT-OF-WAY
80'-120'

RIGHT-OF-WAY
100'-135'

RIGHT-OF-WAY
70'-100'

RIGHT-OF-WAY
60'-100'

RIGHT-OF-WAY
60'-90'

RIGHT-OF-WAY
60'-80'

RIGHT-OF-WAY
60'-80'

Shaded areas optional based on available width

Attachment 4

Regional Motor Vehicle Network

Throughway
Major arterial
Minor arterial
Arterial outside UGB

Urban center
Employment/Industrial area
Urban growth boundary
Metropolitan planning area
County boundary

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

See inset map

Inset map

0 Mile 1

0 5 10 Miles

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

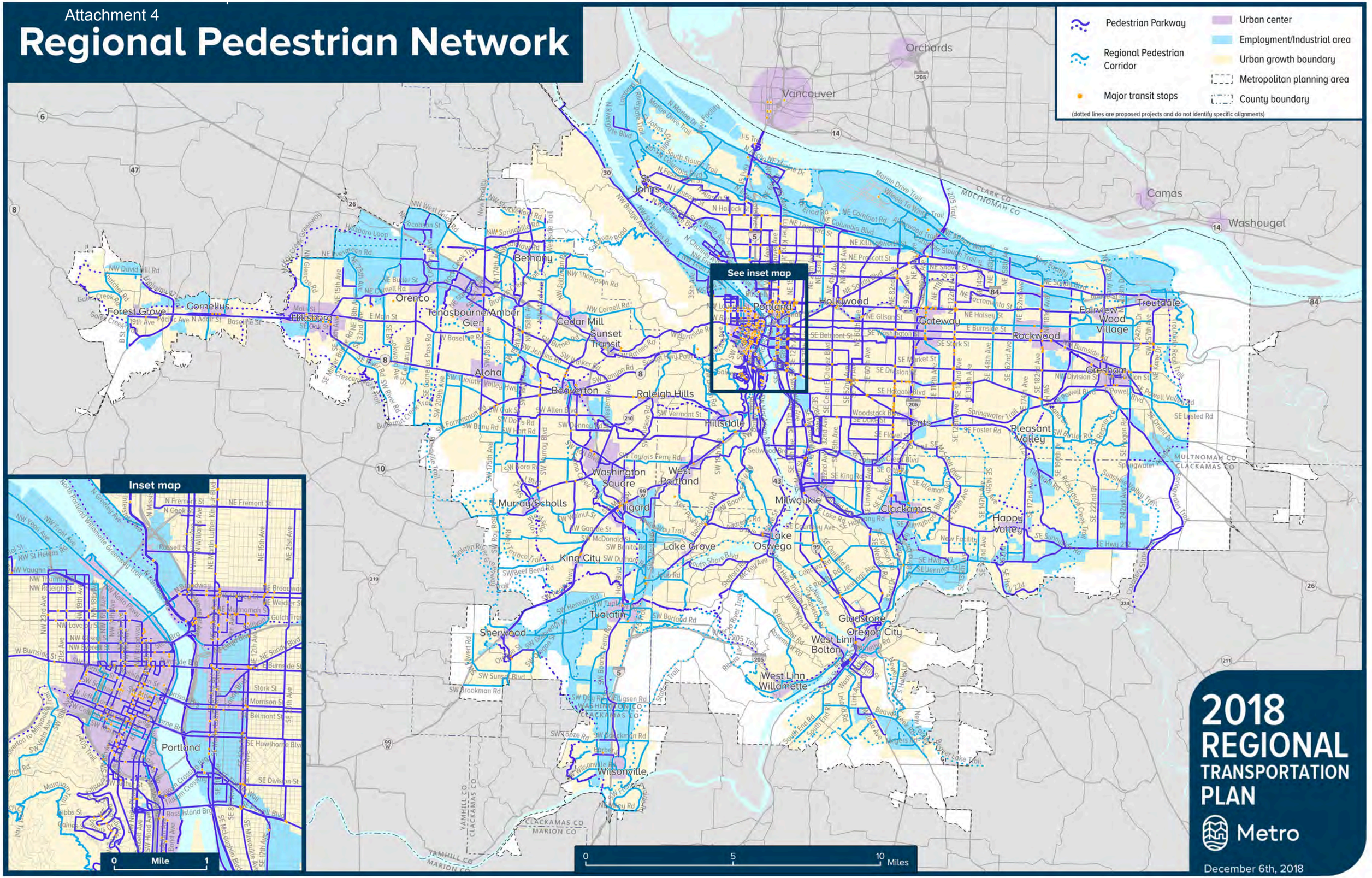
2018 REGIONAL TRANSPORTATION PLAN

Metro

December 6th, 2018

Attachment 4

Regional Pedestrian Network



2018 REGIONAL TRANSPORTATION PLAN

Metro

December 6th, 2018

Attachment 4

Regional Bike Network

Bicycle Parkway
Regional Bikeway
Bike transit facility

Urban center
Employment/Industrial area
Urban growth boundary
Metropolitan planning area
County boundary

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

See inset map

Inset map

0 Mile 1

0 5 10 Miles

2018 REGIONAL TRANSPORTATION PLAN

Metro

December 6th, 2018

Attachment 4

Regional Transit Network

- Light rail transit
- Commuter Rail
- Streetcar
- HCT in progress
- Future HCT*
- Intercity high speed rail
- Enhanced transit connector
- Frequent Bus
- Regional Bus
- Bus service outside MPA
- Major bus stop
- Transit center
- Intercity rail terminal
- Air terminal
- Bus station
- Community/Jobs Connector
- Urban center
- Employment/Industrial area
- Urban growth boundary
- Metropolitan Planning Area
- County boundary

*Includes Bus Rapid Transit, Rapid Streetcar, Light Rail and Commuter Rail. Dotted lines represent future plans and not specific alignments. Bus route geometry is based on modeled networks and may not be geometrically accurate.

See inset map

Inset map

0 Mile 1

0 5 10 Miles

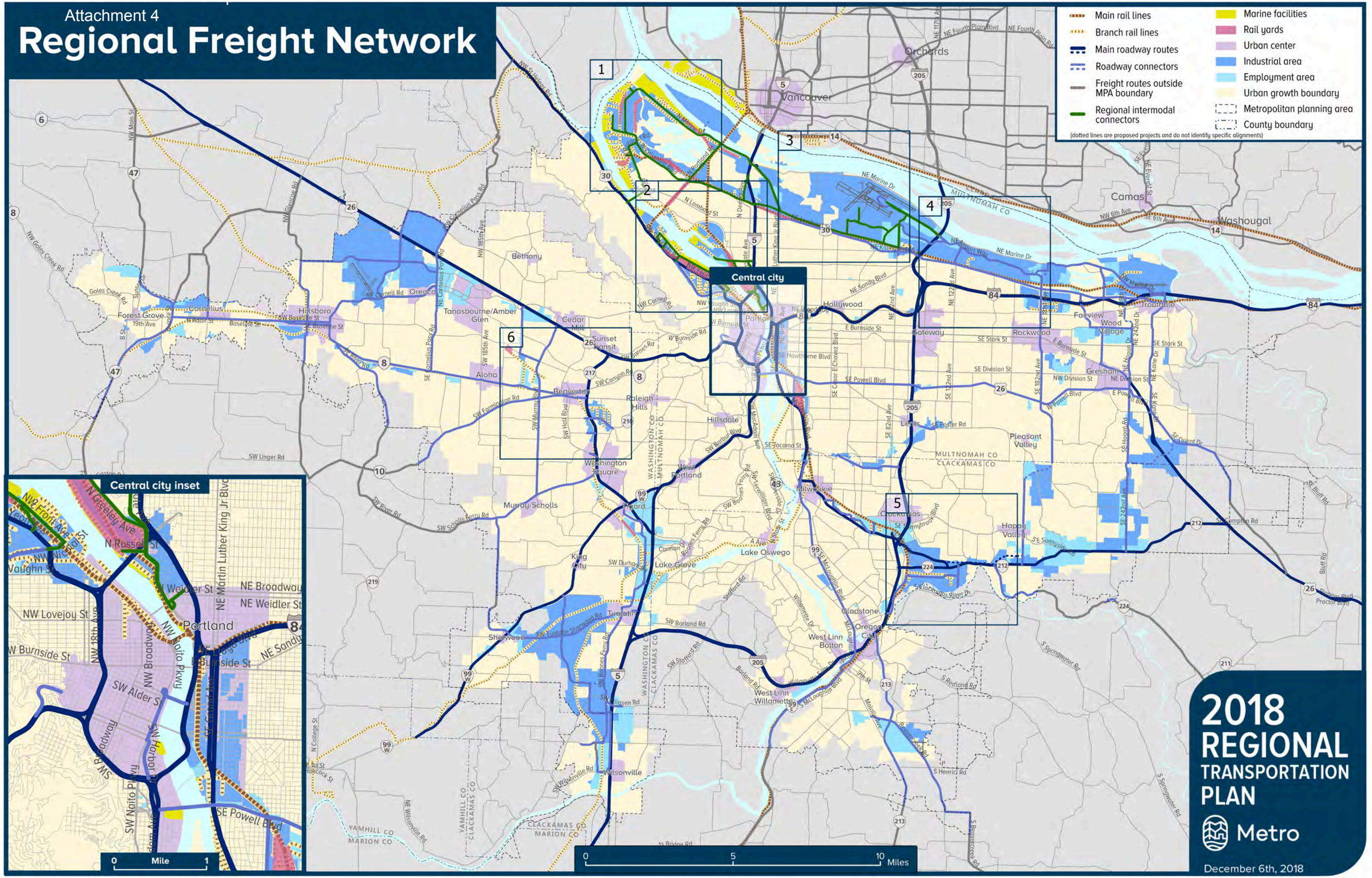
2018 REGIONAL TRANSPORTATION PLAN

Metro

December 6th, 2018

Attachment 4

Regional Freight Network



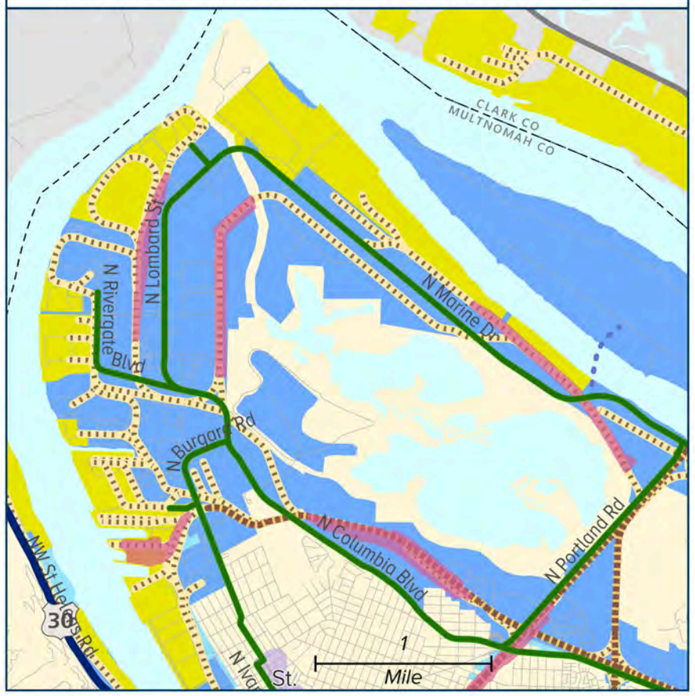
2018 REGIONAL TRANSPORTATION PLAN

Metro

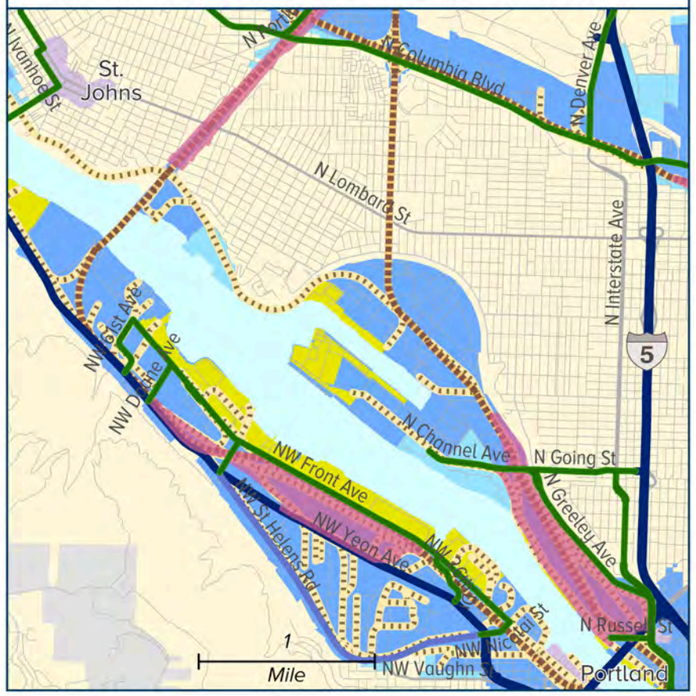
December 6th, 2018

TPAC/MTAC Workshop 4/17/19
Attachment 4

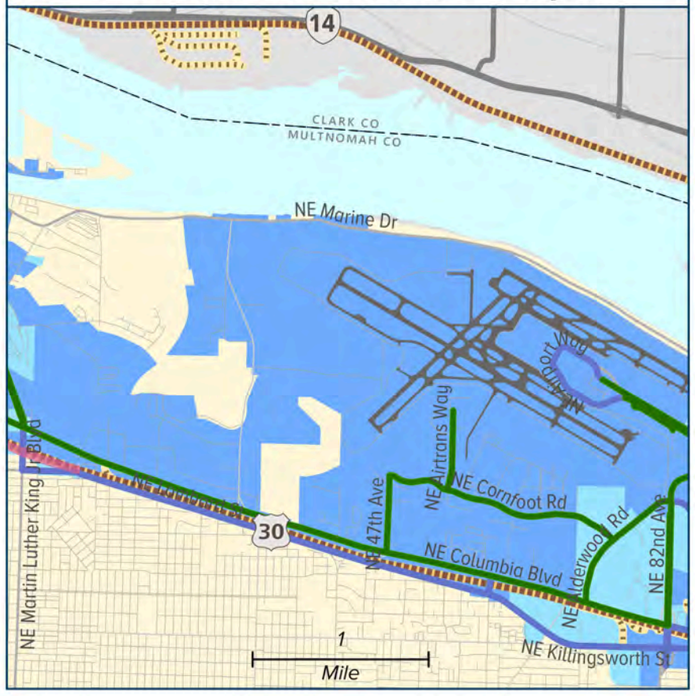
1. North Portland Marine Terminals



2. NW Industrial and Swan Island



3. Portland International Airport



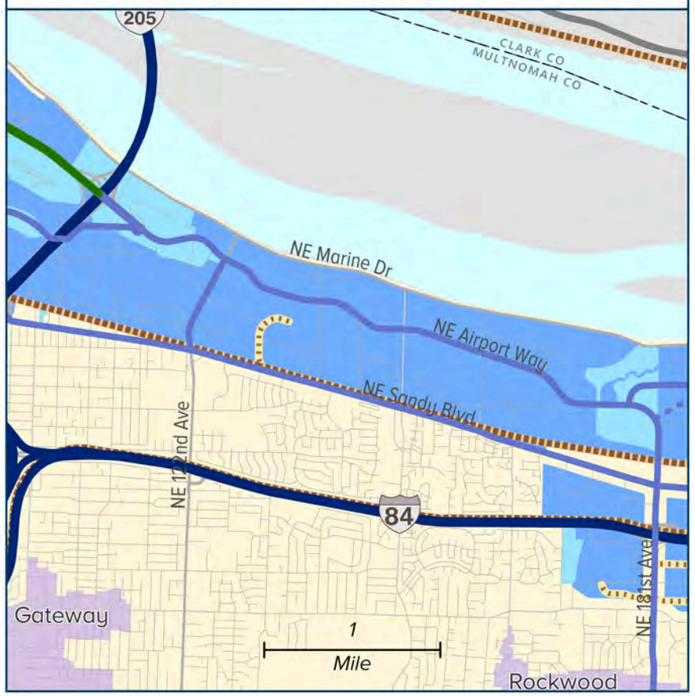
Legend

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

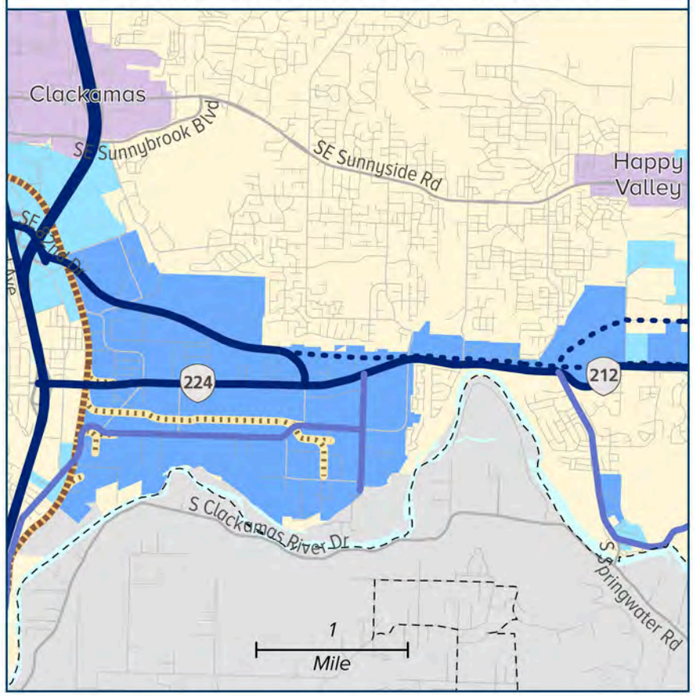
- Main rail lines
- Branch rail lines
- Main roadway routes
- Roadway connectors
- Freight routes outside MPA boundary
- Regional intermodal connectors
- Marine facilities
- Rail yards
- Urban center
- Industrial area
- Employment area
- Urban growth boundary
- Metropolitan planning area
- County boundary

December 6, 2018

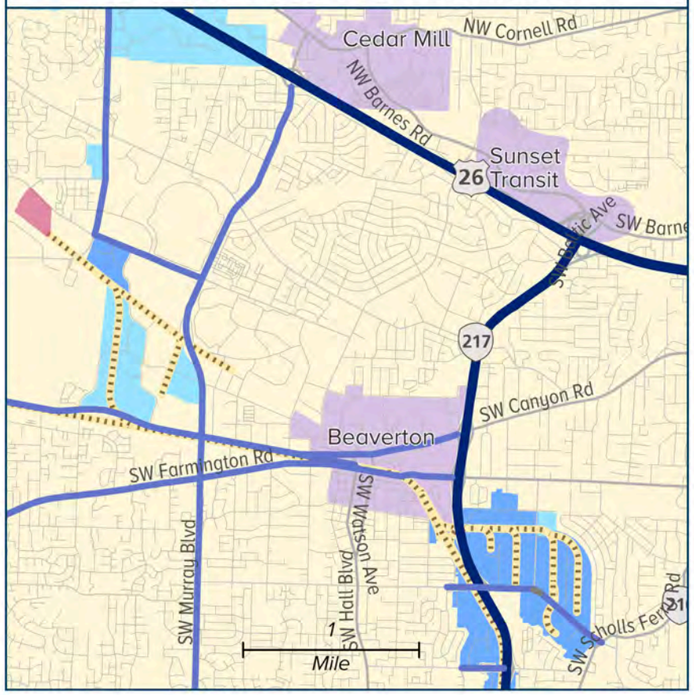
4. Kenton Rail Line/Columbia Corridor

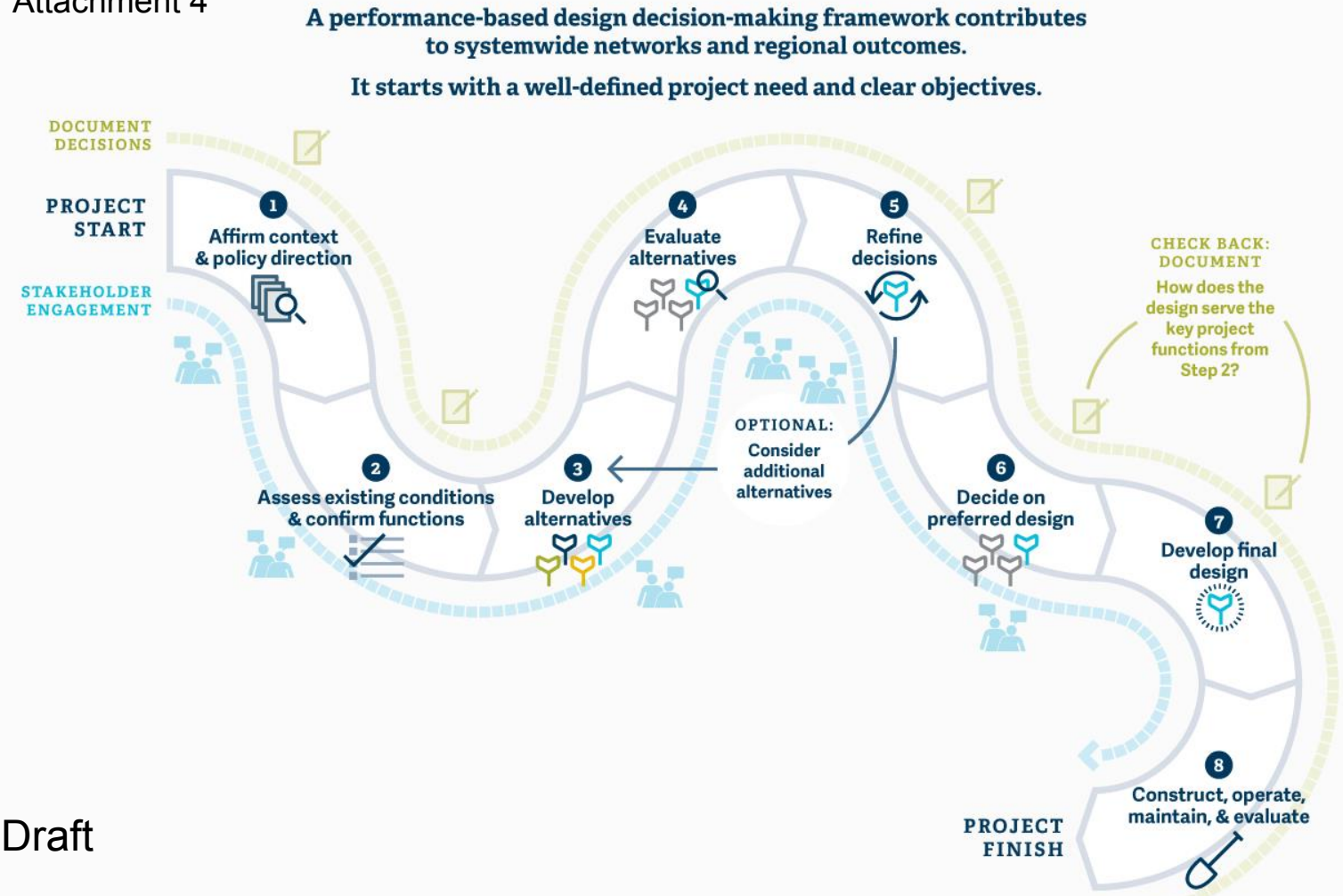


5. Clackamas Industrial Area



6. Beaverton Industrial Area




A performance-based design decision-making framework contributes to systemwide networks and regional outcomes.
It starts with a well-defined project need and clear objectives.
DOCUMENT DECISIONS
PROJECT START
STAKEHOLDER ENGAGEMENT
1
Affirm context & policy direction
2
Assess existing conditions & confirm functions
3
Develop alternatives
4
Evaluate alternatives
5
Refine decisions
OPTIONAL:
Consider additional alternatives
6
Decide on preferred design
7
Develop final design
CHECK BACK: DOCUMENT
How does the design serve the key project functions from Step 2?
8
Construct, operate, maintain, & evaluate
PROJECT FINISH

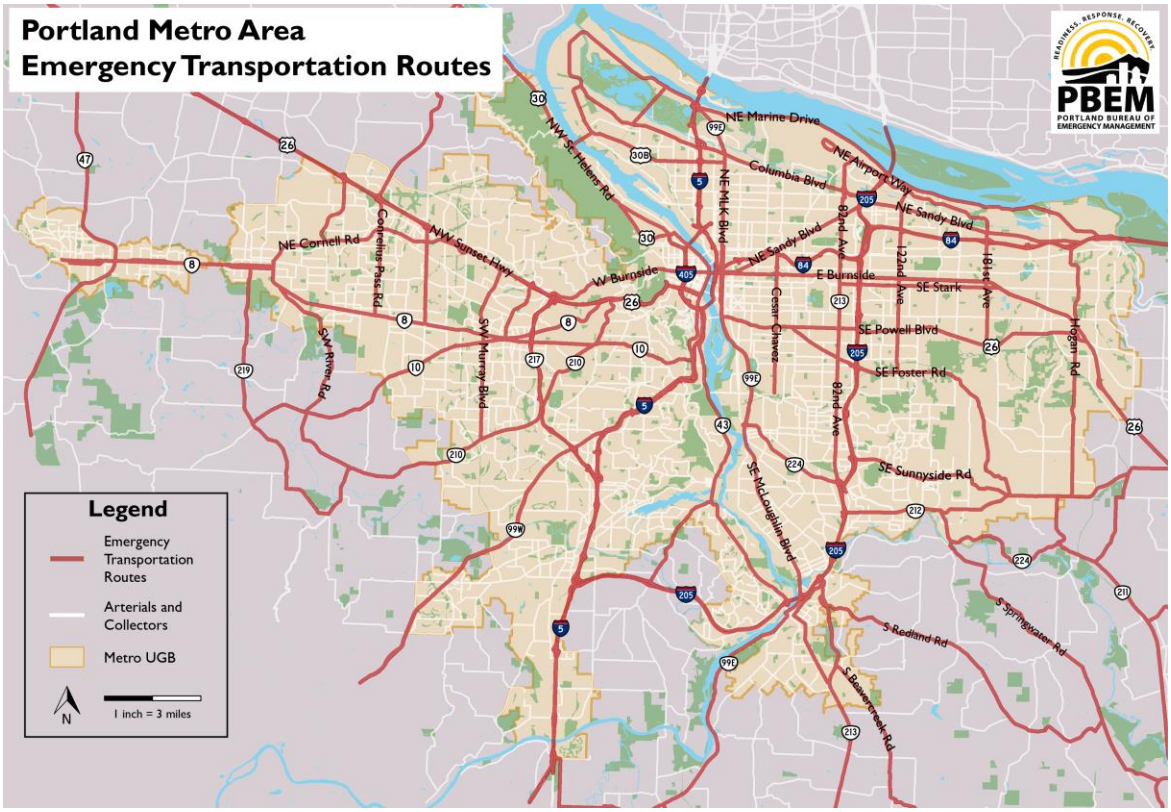
Draft

8.2.3.10 Emergency Transportation Routes Project

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

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

Figure 8.4 Designated Regional Emergency Transportation Routes (2006)



First designated in 1996, regional ETRs are priority routes targeted during an emergency for debris-clearance and transportation corridors to facilitate life-saving and sustaining response activities. The current regional ETRs were established in a Memorandum of Understanding (MOU) between Oregon Department of Transportation (ODOT), Washington State Department of Transportation (WSDOT), Metro and local jurisdictions in the Portland-Vancouver metropolitan region in 2006. That MOU outlines responsibility for the Regional Disaster Preparedness Organization (RDPO) Emergency Management working group (REMTEC) to coordinate an update of the ETRs on a five-year cycle. However, no updates have been made since 2006.

Since 2006, our understanding of the seismic risks in our region has improved. Funded by the RDPO, the 2017 Oregon Department of Geology and Mineral Industries (DOGAMI) Enhanced Earthquake Impact Study assessed seismic vulnerability of buildings and infrastructure in the region, outlining anticipated impacts of a 9.0 Cascadia Subduction Zone (CSZ) earthquake in the Portland-Vancouver region. The DOGAMI analysis shows that most of the existing designated ETRs (meant to facilitate post-earthquake life-safety response activities) in the region will experience significant liquefaction, ground deformation and landslide risks.

ODOT has evaluated the seismic resilience of the state-designated Lifeline Routes in the Oregon portion of the Portland-Vancouver region. Currently, ODOT is working with each county to assess the resiliency of locally designated ETRs and potential detour routes for the most vulnerable state bridges by using arterial streets and throughways. This effort includes an evaluation of the cost-

benefit of the investment on local transportation system compared to the retrofit cost of state-owned bridges bypassed by the proposed detours. In addition, each county in Oregon is recommending changes to the ETRs within their respective jurisdiction based on this analysis. Any updates in Clark County will be coordinated with Washington State.

In 2018, Clackamas County updated their routes while evaluating bridge and overpass facilities on the State Lifeline Routes for ODOT. In 2019, Washington County, Columbia County and Multnomah County will complete a similar analysis of their ETRs in partnership with ODOT. Independent of ODOT's work with the counties, the City of Portland conducted an update of their ETRs in 2018, which will be brought into this planning effort.

Given the above work, the designation of current ETRs need to be re-evaluated at a regional-scale to reflect updates recommended by the City of Portland and each of the five counties. This project will update existing designated regional routes using the latest DOGAMI seismic data, ODOT Lifeline analysis and subsequent county-level bridges and ETR analysis. This will also ensure the updated ETRs are responsive to local and state knowledge and priorities. Planning and updates to infrastructure within the region since 2006 will also inform the ETR update; particularly the now seismically-resilient Sellwood and Tillikum Crossing bridges owned by Multnomah County and TriMet within the City of Portland, and recommendations identified in the 2018 Earthquake Ready Burnside project Feasibility Report.

The 2006 ETR MOU calls for an update every five years; however, more than ten years have passed since the last update. The MOU also established that REMTEC (also known as Regional Emergency Management Work Group) will take the lead to convene stakeholders for the update. REMTEC, a work group of the RPDO, helps develop the region's disaster preparedness capabilities through coordinated planning, training and investment in technology, but does not have dedicated transportation-focused planners within their group.

Expected outcomes of the project include:

- Identification of criteria by which to evaluate and refine the existing ETRs and any alternates that are considered in this work. ODOT considered seismic resiliency in establishment of their lifeline routes to which the ETRs must connect.
- Recommendations for a new MOU or other agreement documenting the updated emergency transportation routes (ETR) on a map of the region. The recommendations will define a reasonable time frame for periodic updates (perhaps extending the update from 5 years to 10 years, per recent practice, and potential responsibilities of the agencies involved (i.e. Departments of Transportation, Metro, TriMet, C-Tran, SMART, RDPO, REMTEC, DOGAMI).
- Recommendations on the updated ETRs for consideration by JPACT and the Metro Council in the next update to the Regional Transportation Plan and other relevant regional plans, policies and strategies.
- Recommendations for future planning work related to regional transportation recovery, resiliency and emergency management in the Portland-Vancouver region for consideration by the region's policymakers.

- Information to support the critical facilities assessment and Regional Recovery Framework Project being developed by the RPDO and the Regional Debris Management Plan developed by Metro.

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

This work will be coordinated through the RPDO and appropriate RPDO work groups, emergency management staff from across the region, the Southwest Washington Regional Transportation Council and technical advisory committee, and the Metro Council and Metro's technical and policy advisory committees. The project will also provide opportunities for stakeholder input. In 2017, Metro partnered with the RPDO to submit a grant application to help fund this work, which, if awarded, would allow this work to begin in summer 2019 pending sufficient resources.

Materials following this page were distributed at the meeting.

Regional Emergency Transportation Routes work plan

The purpose of this project is to update the designated regional Emergency Transportation Routes (ETRs) for the five-county Portland-Vancouver metropolitan region.

What should RDPO and Metro consider as we begin this project?

Regional ETRs need to:

Regional ETRs should connect:

What opportunities do you see with this project?

What questions do you have about this project?

Is there anything else you want to tell us?

If you would prefer email, please send your answers to Kim Ellis (kim.ellis@oregonmetro.gov) or Laura Hanson (laura.hanson@portlandoregon.gov).

Regional emergency transportation routes (ETR) update

Updating the region's emergency transportation routes

Natural disasters can happen anytime, and the transportation system needs to be prepared to withstand them and to facilitate life-saving and life-sustaining activities.

Project overview

The purpose of this project is to update the designated regional Emergency Transportation Routes (ETRs) for the five-county Portland-Vancouver metropolitan region, which includes Clackamas, Columbia, Multnomah and Washington counties in Oregon and Clark County in Washington. The last update occurred in 2006.

Why now?

First designated in 1996, regional ETRs are priority routes targeted during an emergency for rapid damage assessment and debris-clearance and used to facilitate life-saving and life-sustaining response activities.

The current regional ETRs were established in an MOU between the Oregon Department of Transportation (ODOT), Washington State Department of Transportation (WSDOT), the Port of Portland, Clackamas, Columbia, Multnomah and Washington counties and the City of Portland in 2006.

Since 2006, new technology, data and mapping have greatly expanded our understanding of seismic risks in the region. The project will also consider these risks and priorities for emergency response, including transport of first responders (e.g., police, fire and emergency medical services), fuel, essential supplies and patients. Access to critical facilities and services, especially for vulnerable populations will also be considered.

Desired project outcomes

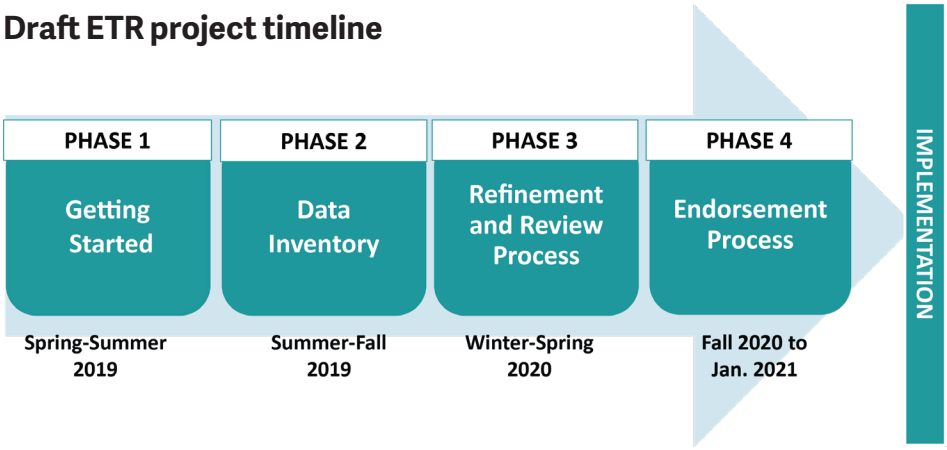
The project's primary outcome is to deliver an updated map of regional ETRs that more accurately reflects our current hazard risks (particularly seismic and landslide risks identified by state agencies in 2017), new and/or improved transportation facilities and map updates identified by state and local agencies during individual review of ETR designations across the region.

The ETR project will deliver an updated regional ETR map and data in ArcGIS platform, a list of ETR corridors and accompanying report and recommendations for use by state, regional and local entities in planning for resiliency, recovery and emergency response.

The ETR update will also:

- Raise the level of visibility of ETRs in transportation planning for emergencies, disasters and significant events
- Improve understanding of the resilience of ETRs to withstand changing environments and quickly restore normal operations
- Facilitate informed dialogs and planning between transportation and other key stakeholders involved in emergency planning
- Strengthen regional partnerships around resiliency, recovery and enhanced transportation networks

Draft ETR project timeline



Partnerships and collaboration

The regional ETR update project is co-led by Metro and the Regional Disaster Preparedness Organization (RDPO) at the City of Portland, but will be supported by a number of local, regional and state partners, as well as a consultant and Portland State University graduate assistant.

The project will rely on existing RDPO and Metro technical and policy committees and working groups as well as county-level coordinating committees to engage individual cities within each county in a coordinated manner.

The ETR update process will engage and consult with transportation, emergency management and public works departments of each county and the City of Portland (via the RDPO's working groups for these disciplines).

In addition, ODOT, WSDOT, as well as the Metro Council, the Joint Policy Advisory Committee on Transportation (JPACT), Southwest Regional Transportation Council (RTC), TriMet, SMART, C-TRAN and DOGAMI will also play a key role in the update.

Other agencies and groups will be engaged and consulted as key stakeholders due to their roles in emergency response and/or critical infrastructure and social services for vulnerable populations, including:

- the Northwest Oregon Health Preparedness Organization (NWHPO)
- RDPO Fire/EMS work group
- RDPO Public Works work group
- paratransit providers
- law enforcement
- ports and other special districts
- water and utility providers, such as Portland General Electric (PGE), Pacific Power and NW Natural, among others.

Timeline and decision-making

The regional ETR update project began in April 2019 and is expected to be completed in January 2021.

Project recommendations will be brought forward for review and endorsement consideration by regional policymakers, including the RDPO Steering Committee, the RDPO Policy Committee, the Metro Council, JPACT and the RTC.

This project is a collaboration between public, private and non-profit stakeholders, co-led by the five-county, bi-state Regional Disaster Preparedness Organization (RDPO) and Metro, the metropolitan planning organization designated by the Governor of Oregon to serve the urban portions of Clackamas, Multnomah and Washington counties.

Funding for this project is being provided by a Urban Area Security Initiative grant.

A project website is under development.

For more information, contact:

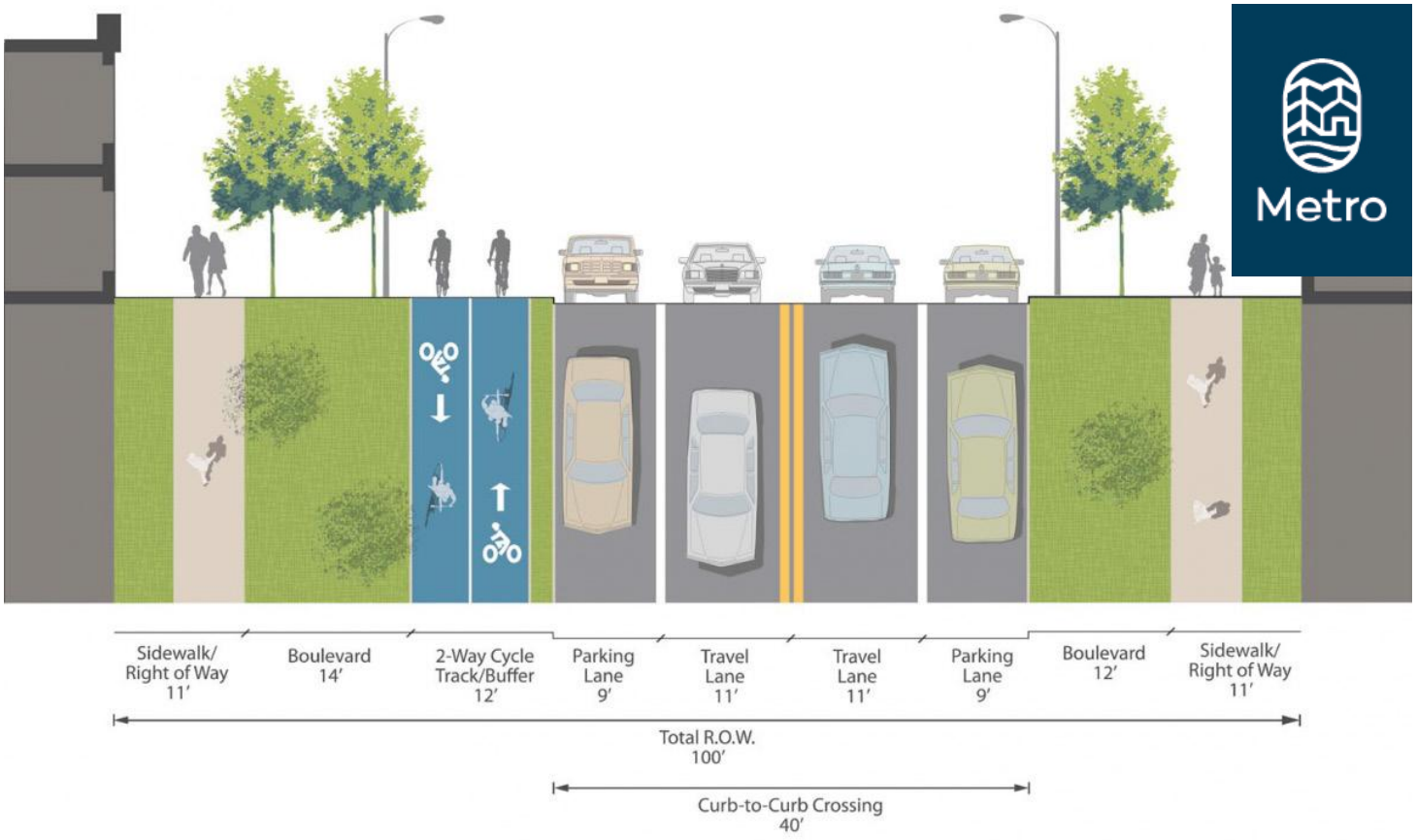
Laura Hanson
Planning coordinator
RDPO
Laura.Hanson@portlandoregon.gov
503.823.9799

Kim Ellis
Principal transportation planner,
Metro
Kim.Ellis@oregonmetro.gov
503.797.1617

Metro RDPO
Regional Disaster Preparedness Organization

Printed on recycled-content paper.

April 16, 2019



2022-2024 Regional flexible fund allocation workshop

10 a.m. to noon, Friday, May 10
Metro Council Chamber
600 NE Grand Ave, Portland, Oregon

The workshop will cover:

- Application and submission requirements
- Description of funding policy priorities and the allocation process
- Implementation process and requirements for awarded projects
- Staff responses to any questions you have

Applications MUST be received by 4:00 p.m. on Friday, June 21, 2019 in order to be considered.

For RFFA application information please go to:

www.oregonmetro.gov/rffa

For more information call 503-797-1757, or email RFFA@oregonmetro.gov

Printed on recycled-content paper, April 2019

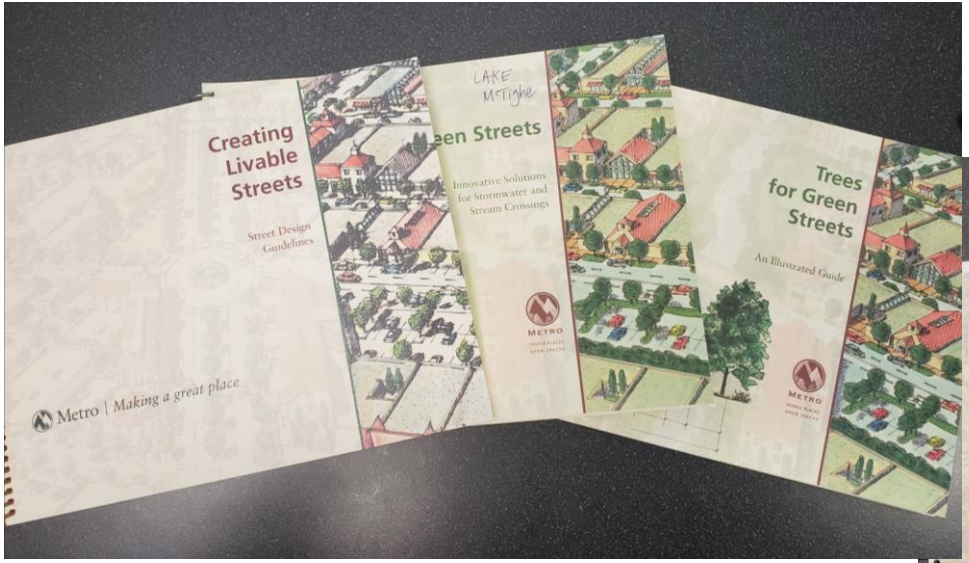
Designing Livable Streets and Trails

TPAC/MTAC Workshop

April 17, 2019

Updating design guidance for regional streets and trails

Projects funded with regional funds must use the guidelines and performance-based planning framework



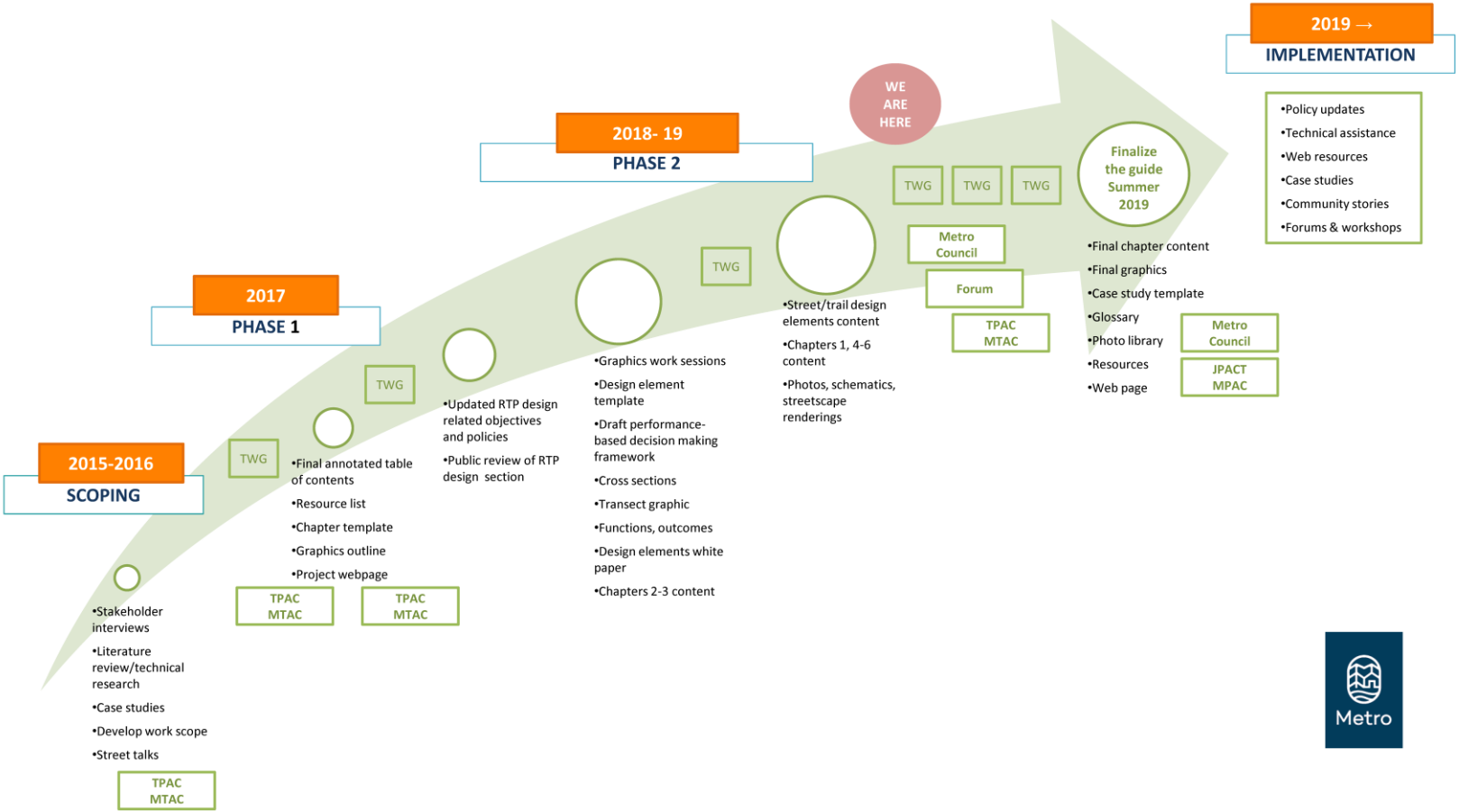
Agencies and organizations represented on the Technical Work Group

A Technical Work Group has provided review & input throughout the update

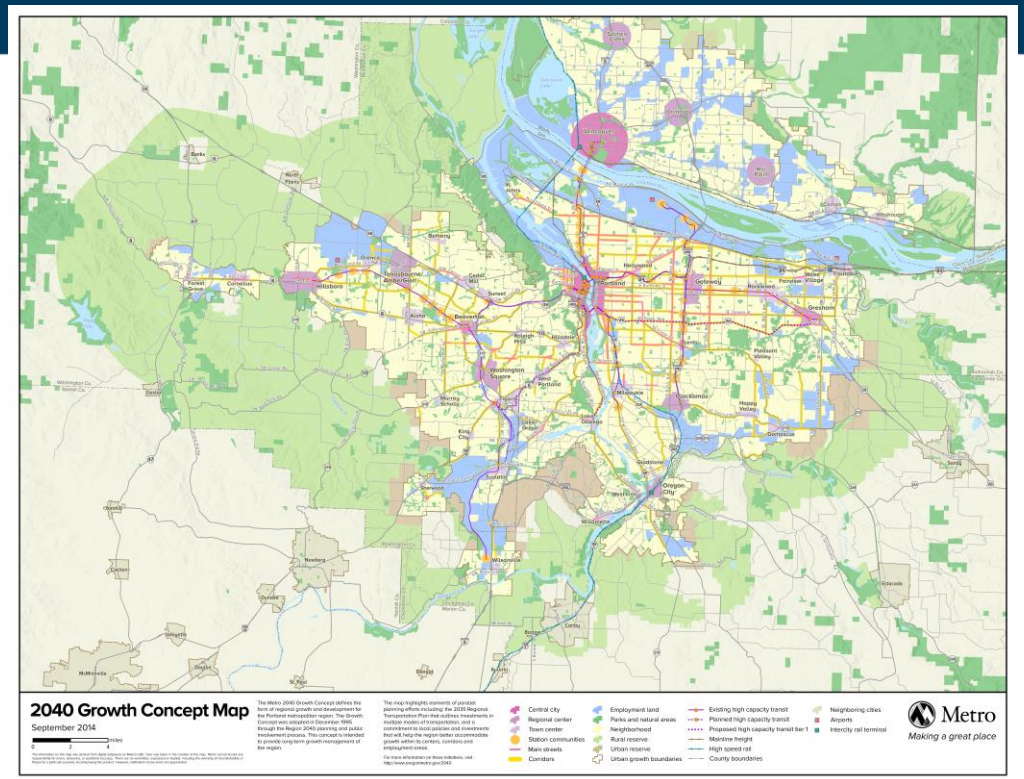
Clackamas County Planning and Engineering
Multnomah County Transportation Planning
Multnomah County - Public Health
Washington County Planning and Engineering
Metro Planning and Development
Metro Parks and Nature
Oregon Department of Transportation, Region 1
Oregon Department of Transportation, Salem
TriMet
US DOT Federal Highways Administration
Tualatin Hills Park and Recreation District
MTAC alternate
Sustainable Cities Initiative, U of O
Better Blocks PDX

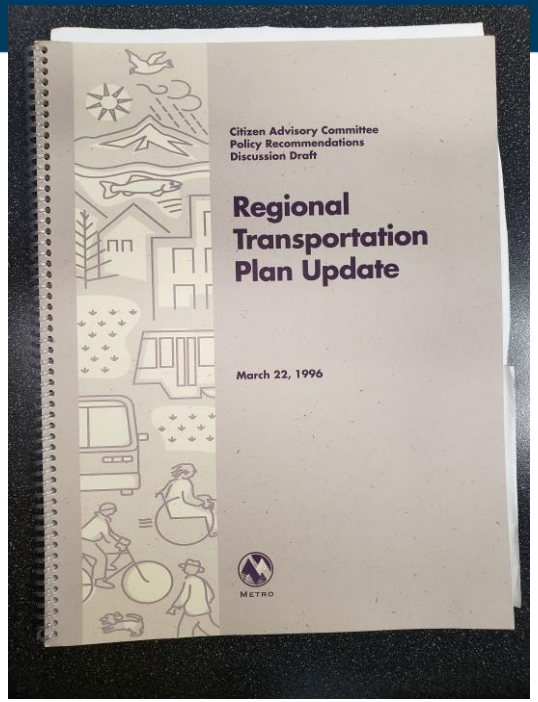
City of Beaverton Transportation Planning
City of Forest Grove Engineering
City of Gresham Planning and Engineering
City of Hillsboro Planning
City of Portland Bureau of Environmental Services
City of Portland Bureau of Transportation
City of Portland Parks and Recreation
City of Sherwood Community Development
City of Tualatin Engineering and Parks
City of West Linn Public Works
City of Wilsonville Engineering
Audubon Society of Portland
Oregon Walks
Safe Routes to School National Partnership
The Street Trust
Landscape architect

Designing Livable Streets + Trails Project Timeline & Deliverables



A brief history of street design in the region





What is in the design guidelines?

Ch 1 Introduction

Ch 2 Regional Policy and Desired Outcomes

Ch 3 Street Functions and Design Classifications

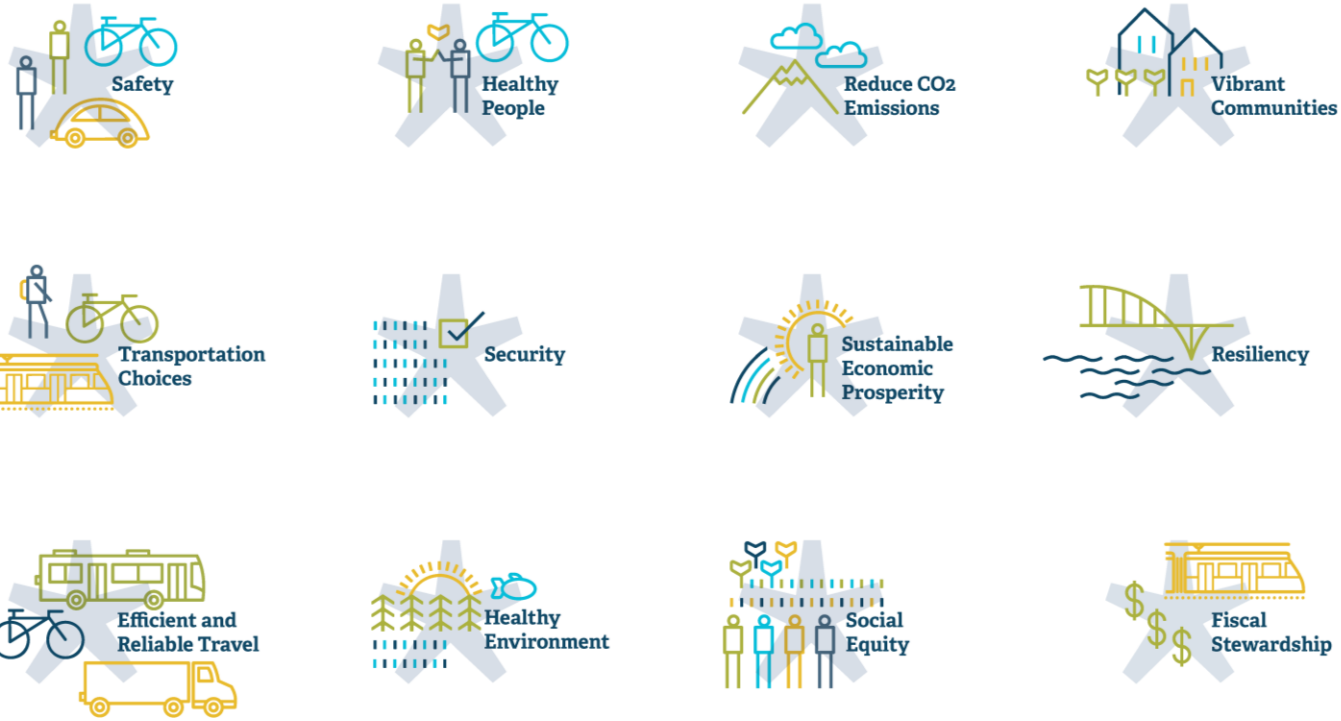
Ch 4 Design Principles and Elements

Ch 5 Visualizing Street and Trail Design

Ch 6 Performance-based Decision-making Framework

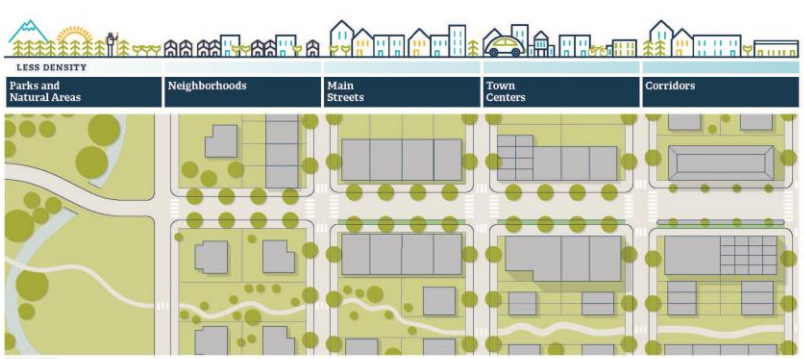
Supplemental: Implementation Strategies and Case Studies

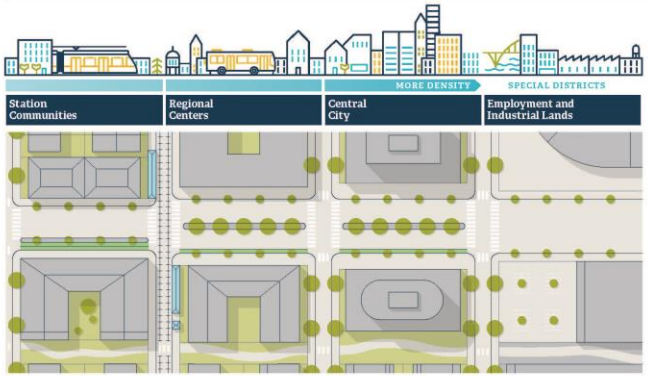
Design decisions are guided by desired policy outcomes/design principles



Street design corresponds to land use

Land Use and Transportation Transect



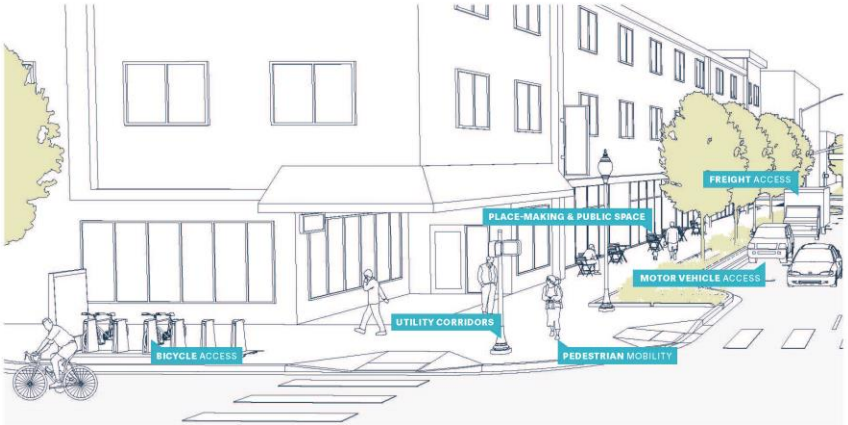


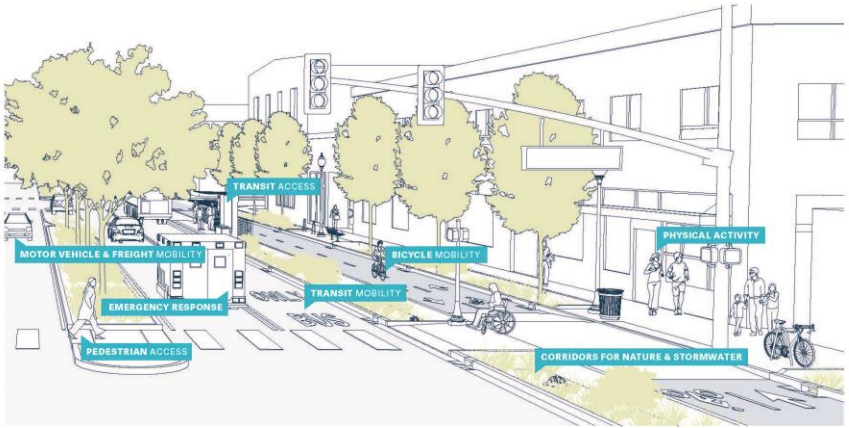
Regional street design classifications support multimodal travel and the specific transportation needs of the 2040 Growth Concept land use types. Local streets serve all land use types and do not have a design classification. Freeways, highways and trails can traverse any type of land use. Roadways in parks and natural areas may have a Parkway design overlay to protect and enhance natural features.

Design serves the different functions of streets

Desired functions are identified in modal plans and adopted policies

Livable Streets and Trails Functions





Pedestrian
ACCESS & MOBILITY

Every street and trail has safe, comfortable space for people walking, rolling and enjoying the place they're in.

Bicycle
ACCESS & MOBILITY

Connected bicycle networks, separated from heavy vehicle traffic, ensure that bicycling is a great way to get around our communities.

Transit
ACCESS & MOBILITY

Our streets enable transit to serve the region with an efficient, reliable way to travel between and within our communities.

Freight
ACCESS & MOBILITY

Key freight corridors provide reliable freight movement, and streets allow delivery access to serve both businesses and residents.

Motor vehicle
ACCESS & MOBILITY

Our streets and throughways provide for safe, reliable travel in motor vehicles, providing space to facilitate pooled or shared trips.

Place-making & Public Space

Our streets and trails are a canvas for our community life and daily commerce, helping to form our regional identity.

Corridors for Nature & Stormwater

Weaving nature and sustainable stormwater management into our streets and trails enhances livability and protect our water, air and natural assets.

Utility Corridors

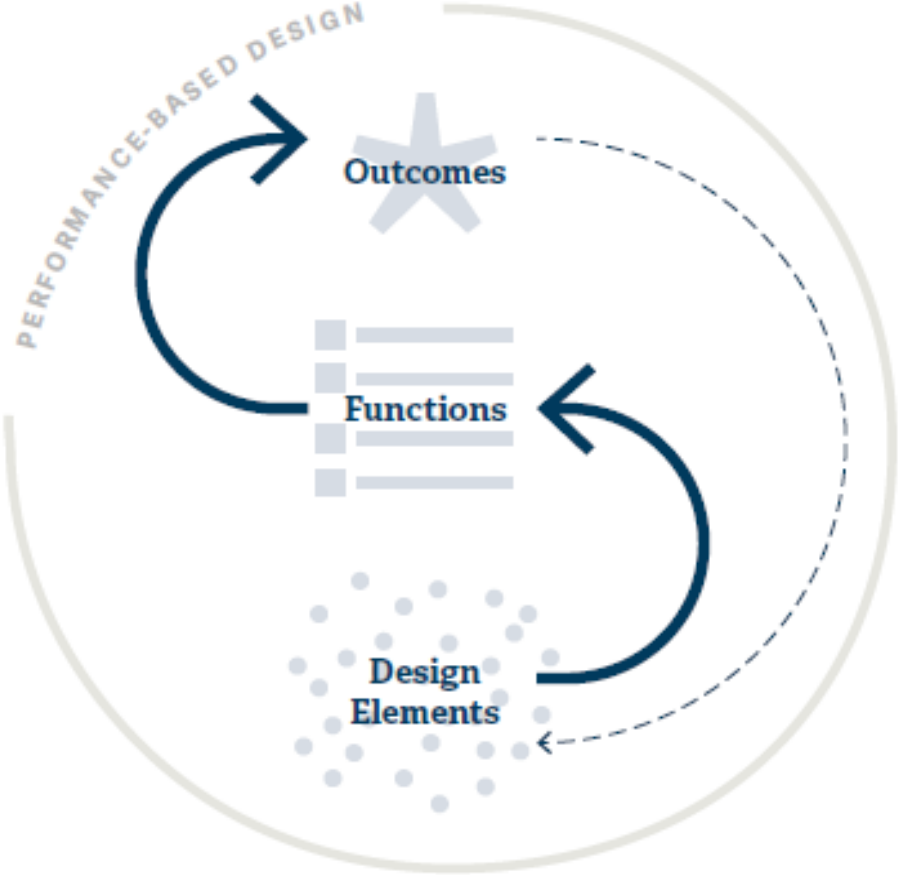
Our transportation corridors move more than just people and goods; they also move water, power, gas, communications and information.

Physical Activity

Our streets and trails are places where people enjoy exercising and spending time outdoors whether for recreation or to get to where they need to go.

Emergency Response

In case of a local or widespread emergency, our streets and throughways must provide access and evacuation routes to keep people safe.



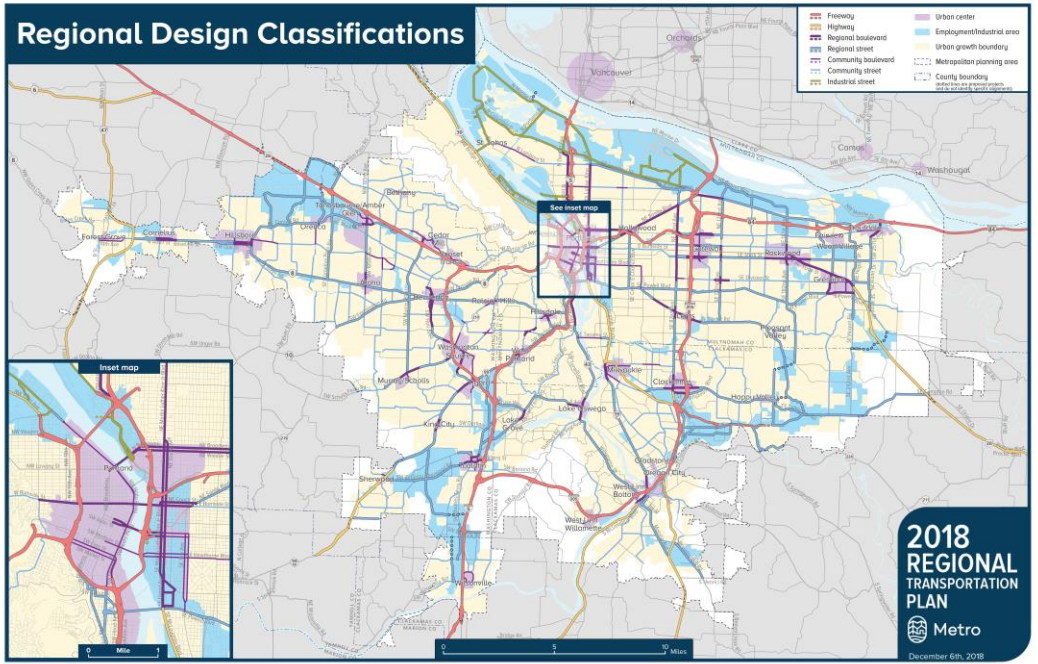
With performance-based design, design elements support street functions to achieve desired outcomes

Regional street design policy classifications

Different designs apply to different classifications

Regional street design classifications dictate how throughways and arterials in the RTP should be designed:

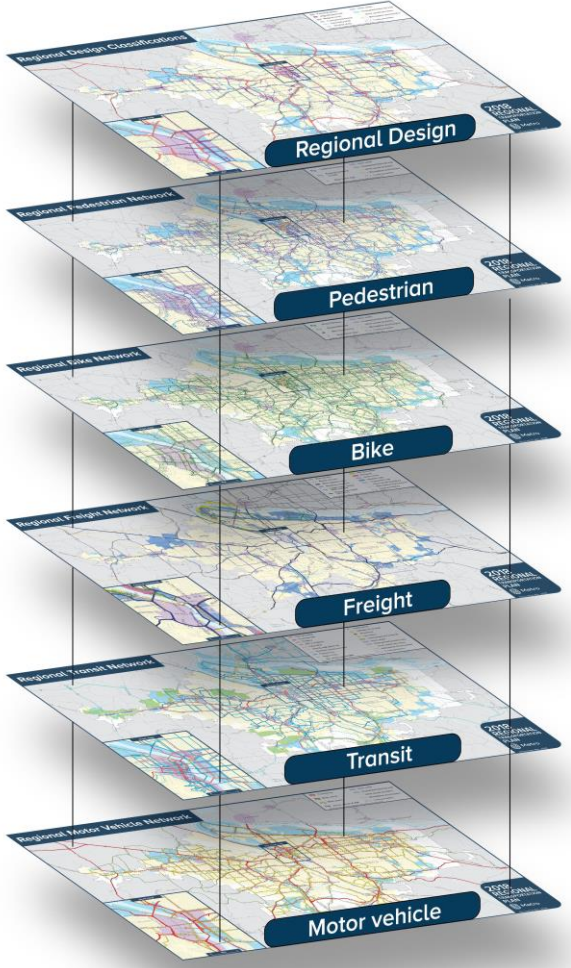
- number of lanes
- priority functions
- design speed
- separation of modes
- flex-zone uses
- place-making/public space
- green infrastructure

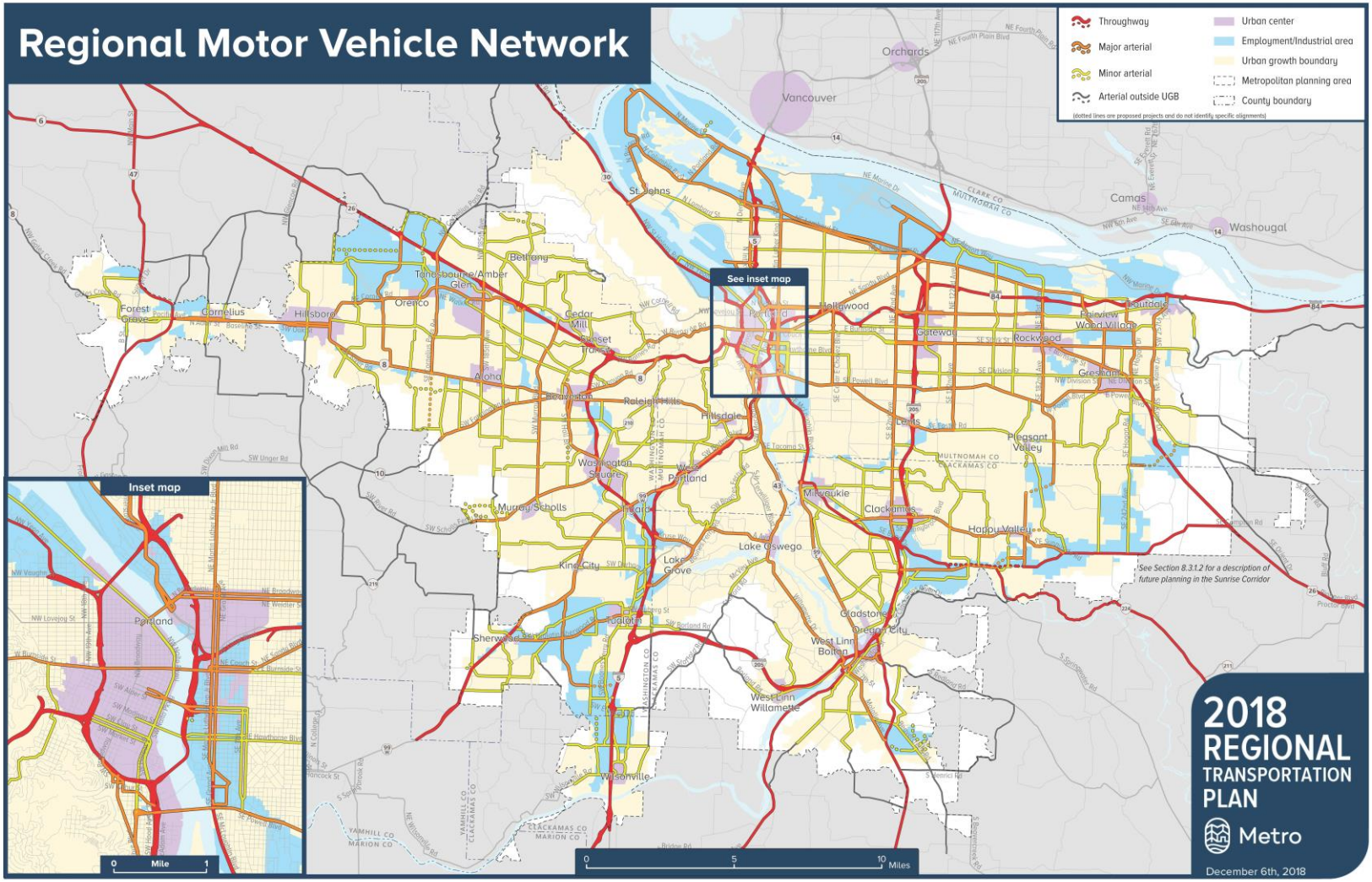


Regional transportation system components

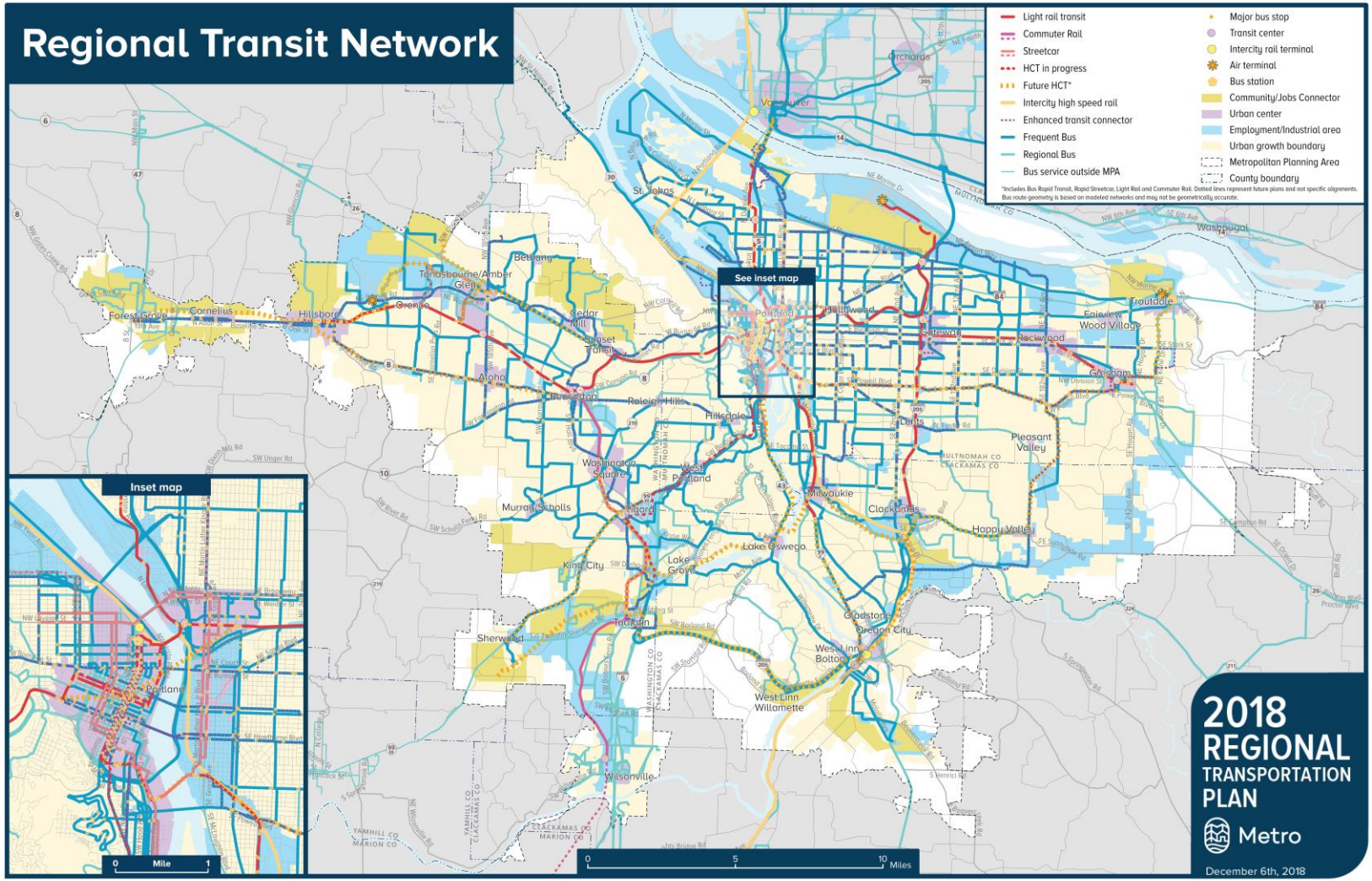
Regional multimodal transportation facilities and services including the following:

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




Regional Motor Vehicle Network
Throughway
Major arterial
Minor arterial
Arterial outside UGB
(dotted lines are proposed projects and do not identify specific alignments)
Urban center
Employment/Industrial area
Urban growth boundary
Metropolitan planning area
County boundary
See inset map
Inset map
See Section 8.3.1.2 for a description of future planning in the Sunrise Corridor
0 Mile 1
0 5 10 Miles
2018 REGIONAL TRANSPORTATION PLAN
Metro
December 6th, 2018

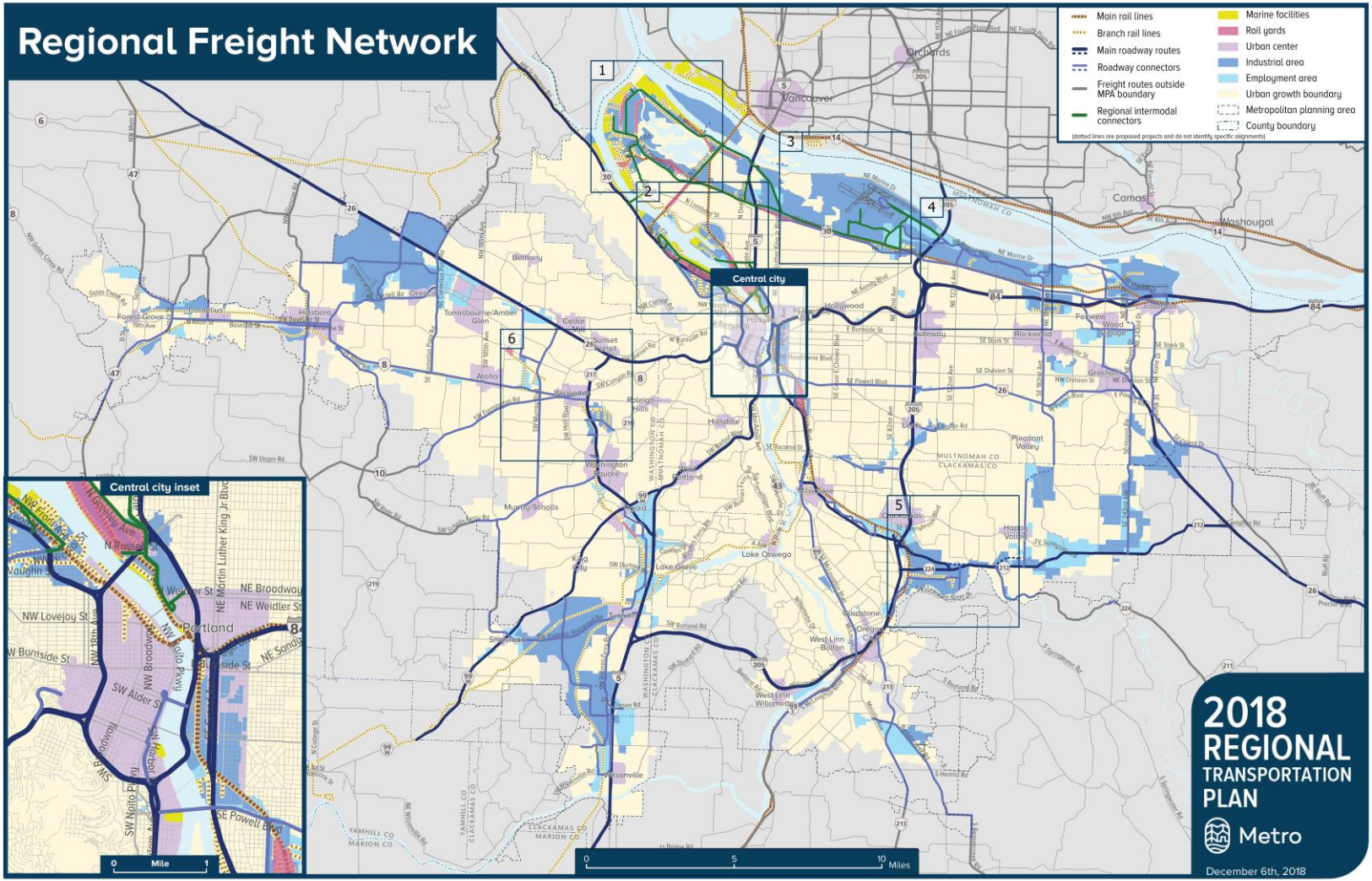
Regional Transit Network



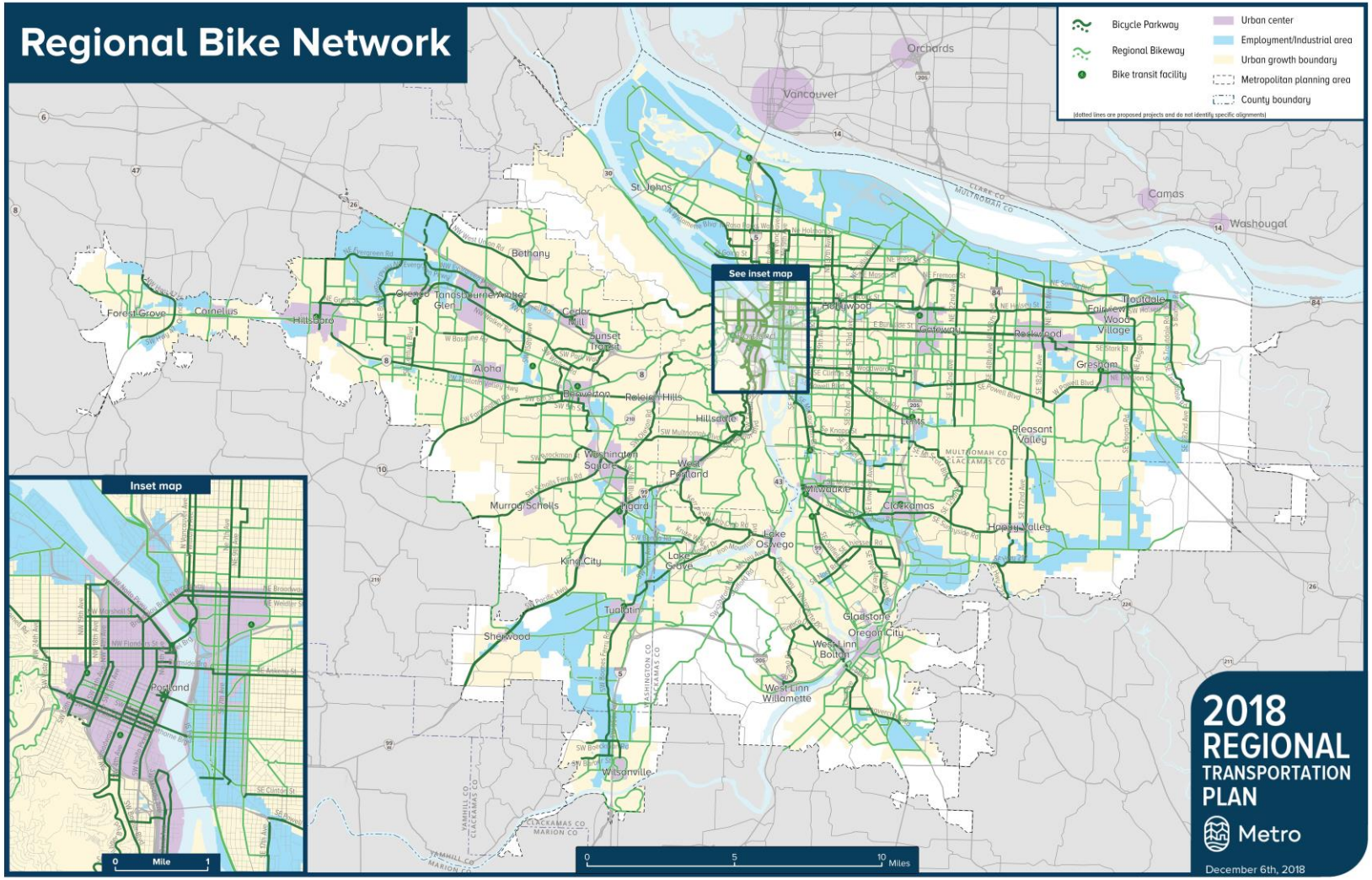
2018 REGIONAL TRANSPORTATION PLAN

Metro

December 6th, 2018


Regional Freight Network
Main rail lines
Branch rail lines
Main roadway routes
Roadway connectors
Freight routes outside MPA boundary
Regional intermodal connectors
[dotted lines are proposed projects and do not identify specific alignments]
Marine facilities
Rail yards
Urban center
Industrial area
Employment area
Urban growth boundary
Metropolitan planning area
County boundary
Central city
Central city inset
0 Mile 1
0 5 10 Miles
2018 REGIONAL TRANSPORTATION PLAN
Metro
December 6th, 2018

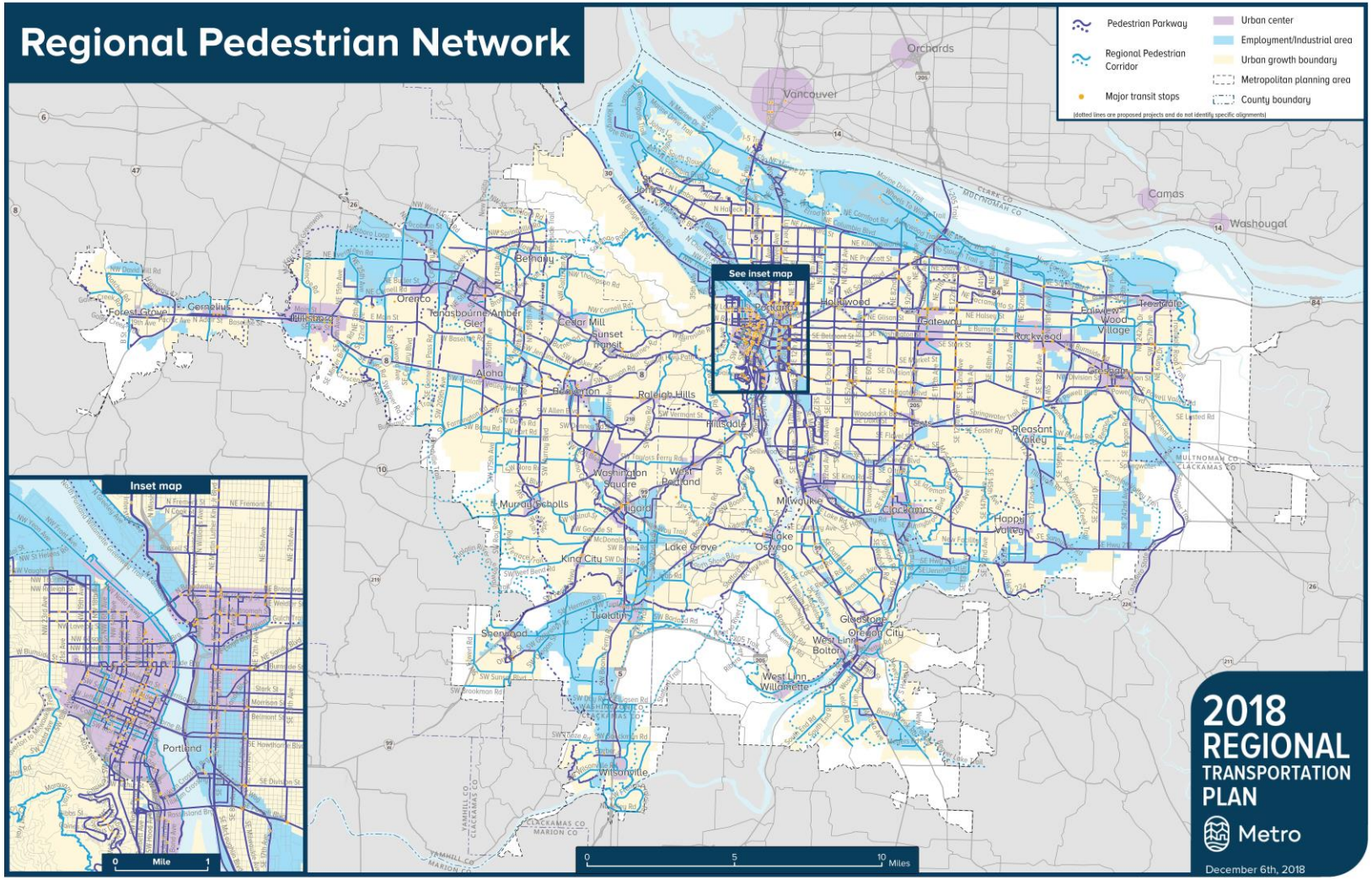
Regional Bike Network



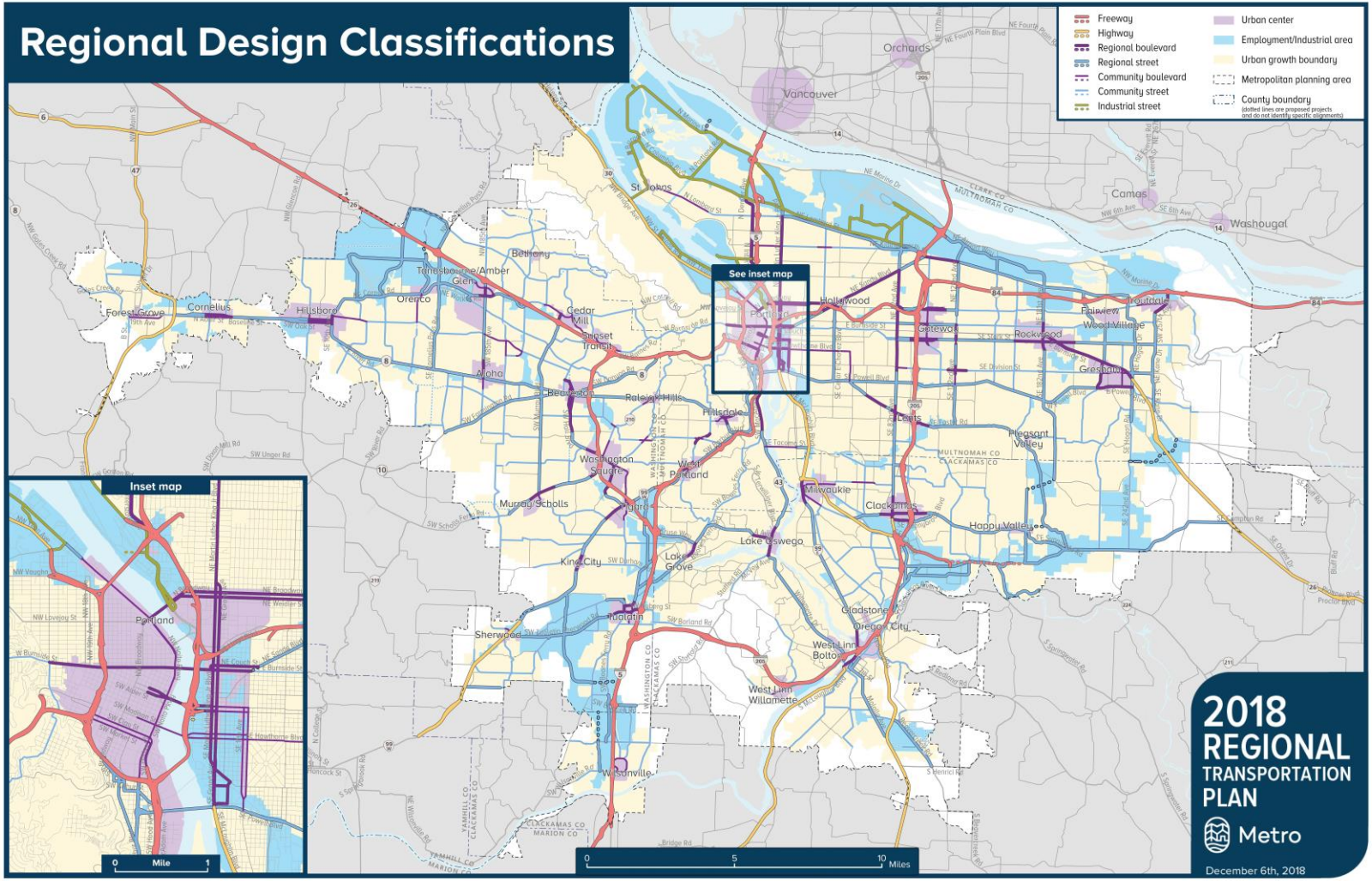
2018 REGIONAL TRANSPORTATION PLAN

Metro

December 6th, 2018


Regional Pedestrian Network
Pedestrian Parkway
Regional Pedestrian Corridor
Major transit stops
(dotted lines are proposed projects and do not identify specific alignments)
Urban center
Employment/Industrial area
Urban growth boundary
Metropolitan planning area
County boundary
See inset map
Inset map
Portland
0 Mile 1
0 5 10 Miles
2018 REGIONAL TRANSPORTATION PLAN
Metro
December 6th, 2018

Regional Design Classifications



2018 REGIONAL TRANSPORTATION PLAN

Metro

December 6th, 2018

Freeway and highway design classifications

Freeway and highway design classifications emphasize long-distance motor-vehicle and high-capacity transit travel, connect major activity centers and are separated from the surrounding land use. Bicycle and pedestrian travel are provided on separate facilities. Freeways are completely grade separated, while highways have some at-grade access and turns.

Shaded areas optional based on available width

Regional and community boulevard design classifications

Regional and community boulevard classifications are applied to roadways within 2040 centers, station communities and to main streets. Boulevards serve major centers of urban activity and emphasize access and mobility for public transportation and people walking and bicycling.

RIGHT-OF-WAY
90'-120'

RIGHT-OF-WAY
70'-100'

RIGHT-OF-WAY
60'-80'

Shaded areas optional based on available width

Regional and community street design classifications

Regional and community street classifications are applied to transit corridors, main streets, industrial and employment areas and neighborhoods with designs that integrate all modes of travel and provide accessible and convenient pedestrian, bicycle and public transportation travel.

RIGHT-OF-WAY
80'-120'

RIGHT-OF-WAY
60'-100'

RIGHT-OF-WAY
60'-80'

Shaded areas optional based on available width

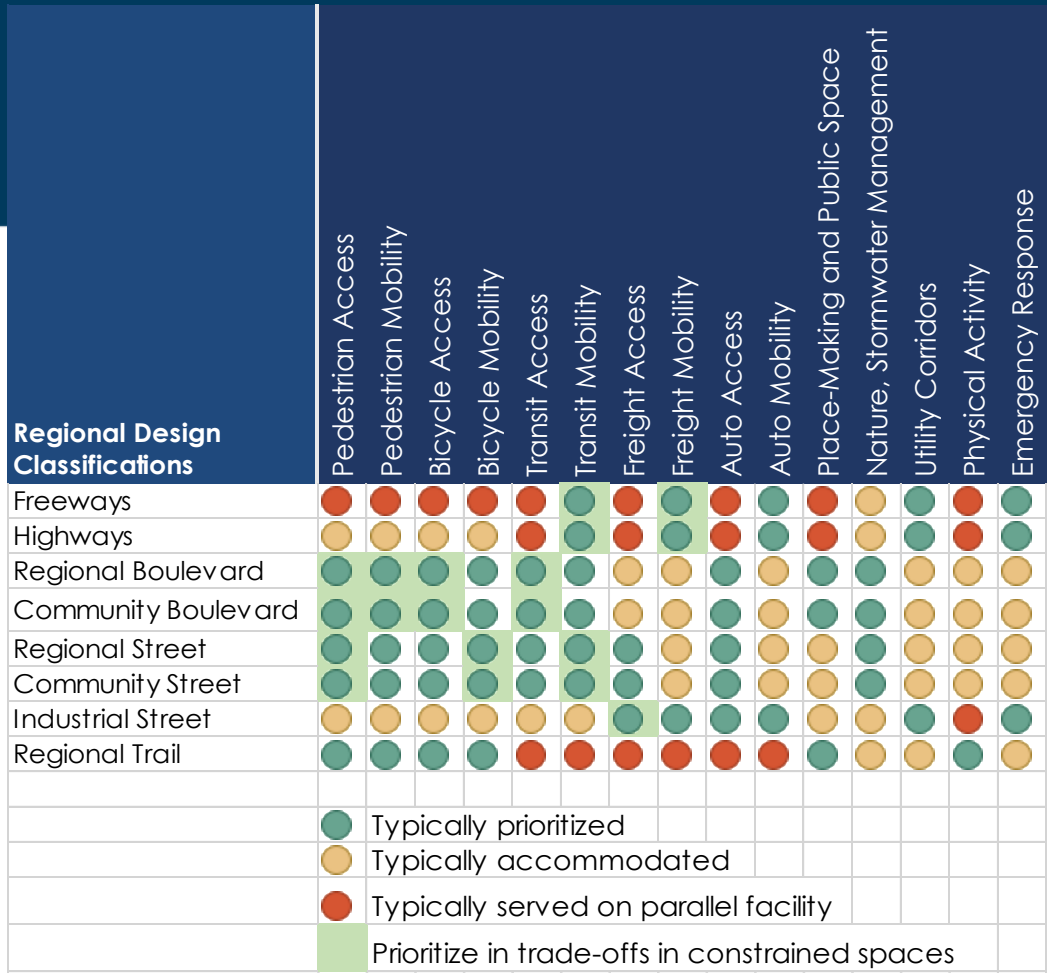
Industrial street design classification

Industrial street classifications are applied to roadways that serve intermodal facilities such as airports, and to roadways in industrial and employment areas. Designs primarily serve freight mobility and access while integrating multi-modal travel and access to transit.

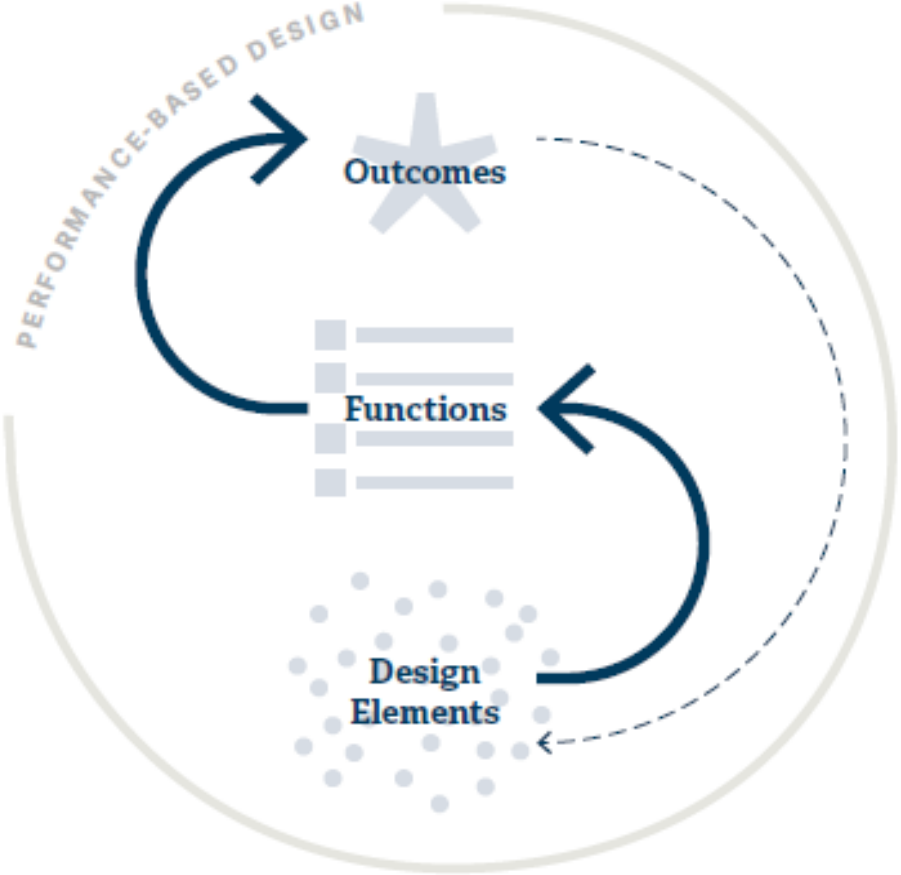
Shaded areas optional based on available width

Design classifications guide design decisions

The design guide provides general guidance on what mobility, access and other functions are typically prioritized or accommodated on the different street design classifications and on regional trails



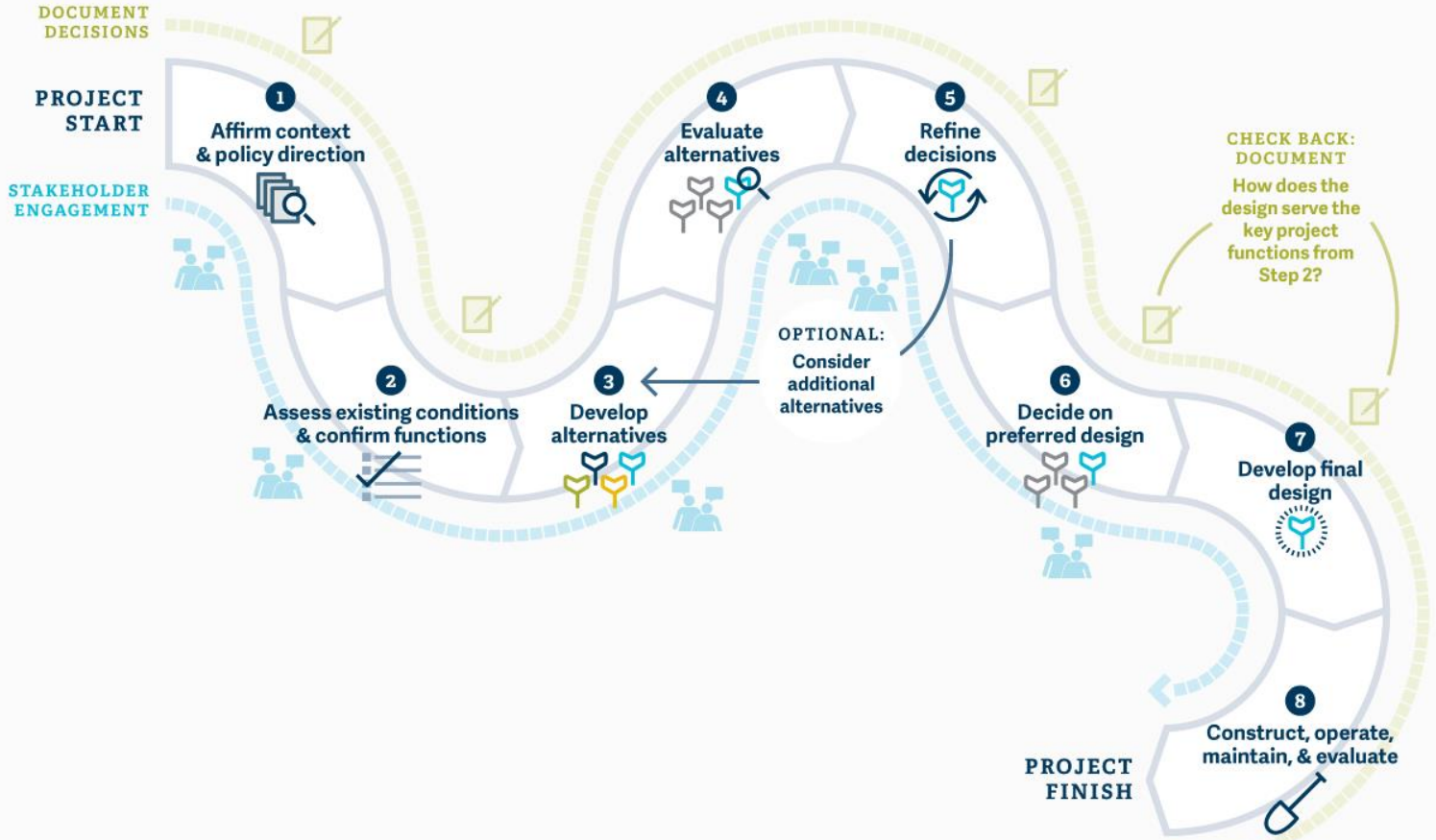
Design Classification	Prioritized modes of travel	Land use context	Street connections	Target/ design speed	Number of travel lanes	Medians and turn lanes	Flex-zone/parking	Pedestrian design	Bikeway design	Transit design	Freight design
Freeways	Motor-vehicle, freight, transit	Any	Limited, grade separated	45 to 60 mph	Six with auxiliary lanes in some places	Barrier with shoulders No turn lanes	Shoulder for safety, emergency use, bus on shoulder or HOV	Parallel facility Crossings on over or underpasses	Parallel facility Crossings on over or underpasses	Bus-on-shoulder, express bus, light-rail	Enhanced mobility
Highways	Motor-vehicle, freight, transit	Any	Limited, some at grade, signalized	45 to 60 mph	Up to six with auxiliary lanes in some places	Median Limited turn lanes in some locations.	Shoulder for safety, emergency use, bus on shoulder or HOV	Parallel facility Crossings on over or underpasses	Parallel facility Crossings on over or underpasses	Bus-on-shoulder, express bus, light-rail	Enhanced mobility
Regional Boulevard	Pedestrian, transit, bicycle Access for the above and auto	Centers, station communities and some main streets	Many; access management emphasized	20 to 25 mph	Up to four lanes	Median Some turn lanes	Parking, green streets, protected bikeway, enhanced bus, etc.	Wide sidewalks with buffer Enhanced crossings and access to transit	Protected bikeway unless on parallel facility Enhanced crossings	Enhanced stations, priority bus treatments on ETC routes	Loading and unloading; Truck aprons
Community Boulevard	Pedestrian, transit, bicycle Access for the above and auto	Centers, station communities and some main streets	Many; access management emphasized	20 to 25 mph	Two to four lanes	Median Some turn lanes	Parking, green streets, protected bikeway, enhanced bus, etc.	Wide sidewalks with buffer Enhanced crossings and access to transit	Protected bikeway unless on parallel facility Enhanced crossings	Enhanced stations, priority bus treatments on ETC routes	Loading and unloading; Truck aprons
Regional Street	Pedestrian, transit, bicycle Access for all modes	Corridors, neighborhoods, some main streets and employment and industrial areas	Some to many; access management emphasized	20 to 30 mph	Up to four lanes	Median Some turn lanes	None, or parking, green streets, protected bikeway, enhanced bus, etc.	Wide sidewalks with buffer Enhanced crossings and access to transit	Protected bikeway unless on parallel facility Enhanced crossings	Enhanced stations, priority bus treatments on ETC routes	Loading and unloading
Community Street	Pedestrian, transit, bicycle Access for all modes	Corridors, neighborhoods, some main streets and employment and industrial areas	Some to many	20 to 30 mph	Two to four lanes	Median Some turn lanes	None, or parking, green streets, protected bikeway, enhanced bus, etc.	Wide sidewalks with buffer Enhanced crossings and access to transit	Protected bikeway unless on parallel facility Enhanced crossings	Enhanced stations, priority bus treatments on ETC routes	Loading and unloading
Industrial Street	Motor-vehicle, freight, transit	Employment and industrial areas; Intermodal Connectors on freight network	Some; access management emphasized	20 to 40 mph	Two to four lanes	Median Some turn lanes	None, or parking, green streets, protected bikeway, enhanced bus, etc.	Sidewalk with buffer or multi-use path Enhanced crossings and access to transit	Protected bikeway unless on parallel facility, or multi-use path Enhanced crossings	Accessible stations, priority bus treatments on ETC routes	Priority freight treatments, wider lanes and intersections



With performance-based design, design elements support street functions to achieve desired outcomes

A performance-based design decision-making framework contributes to systemwide networks and regional outcomes.

It starts with a well-defined project need and clear objectives.



Design principles

- Safe Systems Approach
- Safe Speeds
- Designing for All Users
- Street and Network Connectivity
- Flexible Approach to Geometric Design
- Protecting Our Environment
- Design for the Future We Want

Design element guidance example

Regional Design Classifications	Bicycle Facility						
	Shared street/ shared lanes*	Standard 6' bike lane*	Buffered bike lane	Separated Bike Lanes (one-way)	Separated Bike Lanes (two-way)	Multi-use path (shared alignment)	Parallel facility (path or street)
Freeways	🔴	🔴	🔴	🔴	🔴	🟢	🟢
Highways	🔴	🔴	🔴	🟡	🟡	🟢	🟢
Regional Boulevard	🔴	🔴	🟡	🟢	🟡	🟡	🟡
Community Boulevard	🔴	🔴	🟡	🟢	🟡	🟡	🟡
Regional Street	🔴	🔴	🟡	🟢	🟡	🟡	🟡
Community Street	🔴	🔴	🟡	🟢	🟡	🟡	🟡
Industrial Street	🔴	🔴	🟡	🟢	🟡	🟢	🟢
	🟢	Preferred condition					
	🟡	Potential condition					
	🔴	Not a preferred condition					

* These facilities do not serve most potential users on streets with regional design classifications, however, this design may be appropriate on other streets with low vehicle speeds and volumes.

Next steps

April 22- Performance-based design forum and workshop

May 6 – draft design guidelines sent to Technical Work Group and interested parties (including TPAC and MTAC)

May 20 – final meeting of the TWG to review rough draft of guidelines

May 24 – deadline to provide additional comments on design guidance

June to early fall – finalize guidelines

Early fall - Metro Council considers guidelines for adoption

oregonmetro.gov

April 17, 2019

REGIONAL EMERGENCY TRANSPORTATION ROUTES UPDATE

Kim Ellis, Metro

Laura Hanson, RDPO

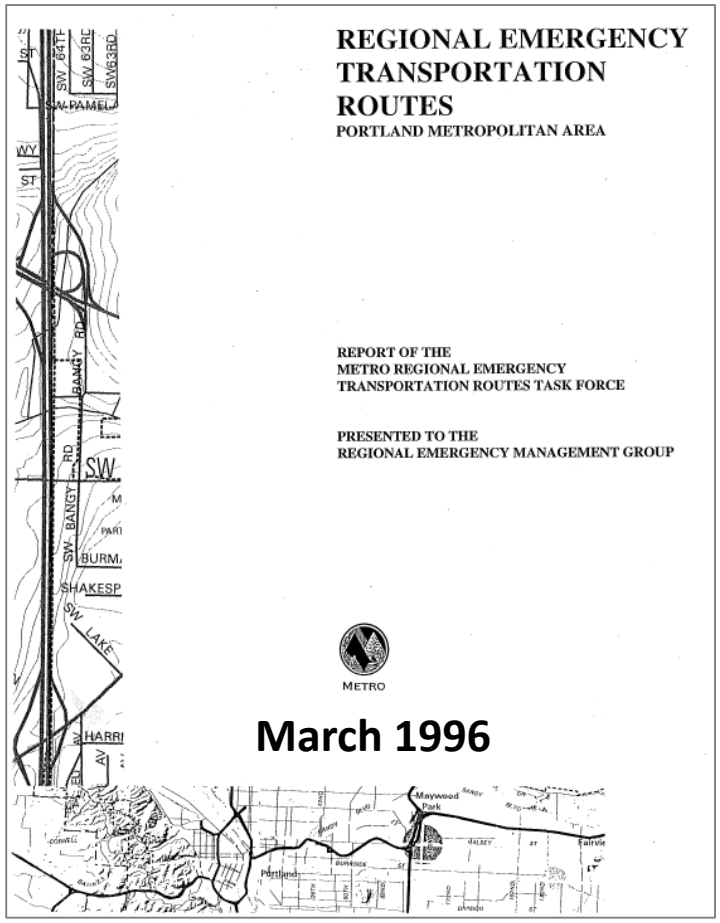
Today’s purpose

Provide a project update

Seek input on key questions to inform project moving forward

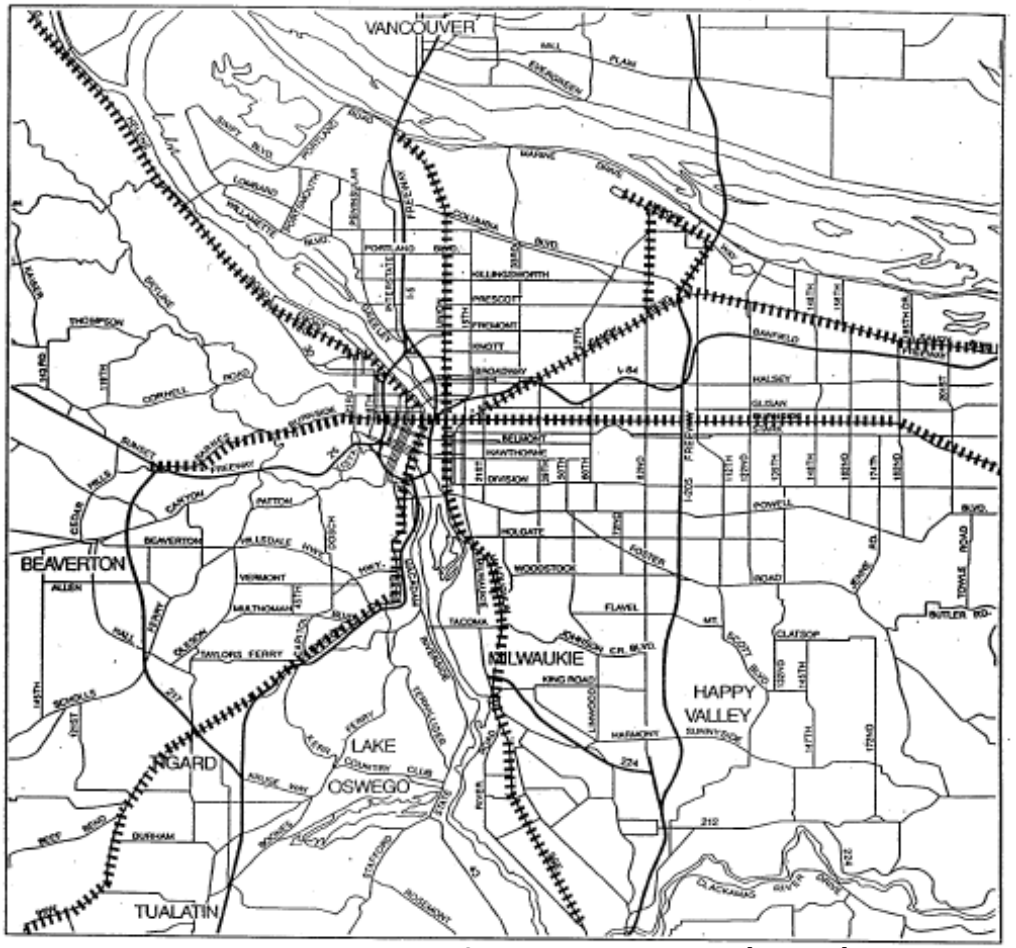
A brief history

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



Regional emergency lifeline corridors identified in 1994

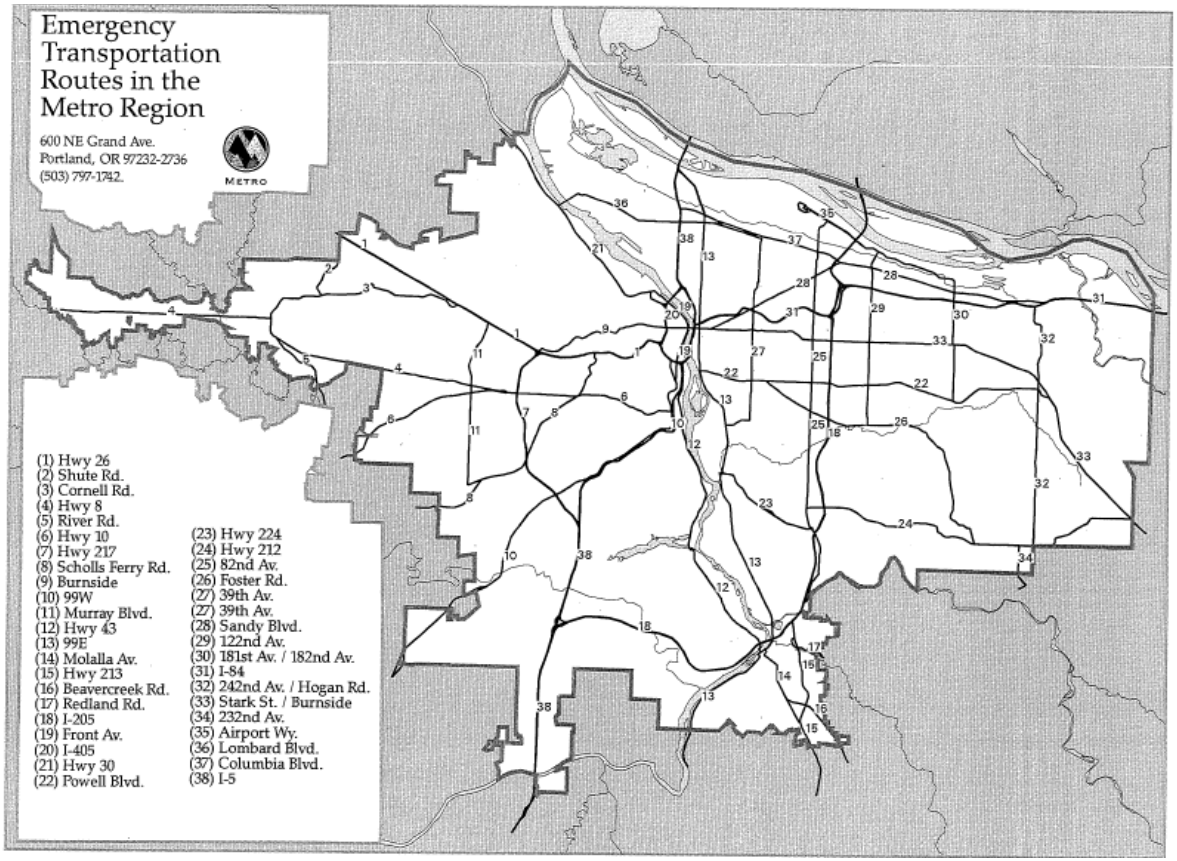
- 99E
- Burnside/Barnes/US 26
- US 30 (St. Helens Road/Front Avenue)
- 99W/Barbur Boulevard
- Sandy Boulevard
- Airport Way



Designated Emergency Lifeline Corridors (1994)

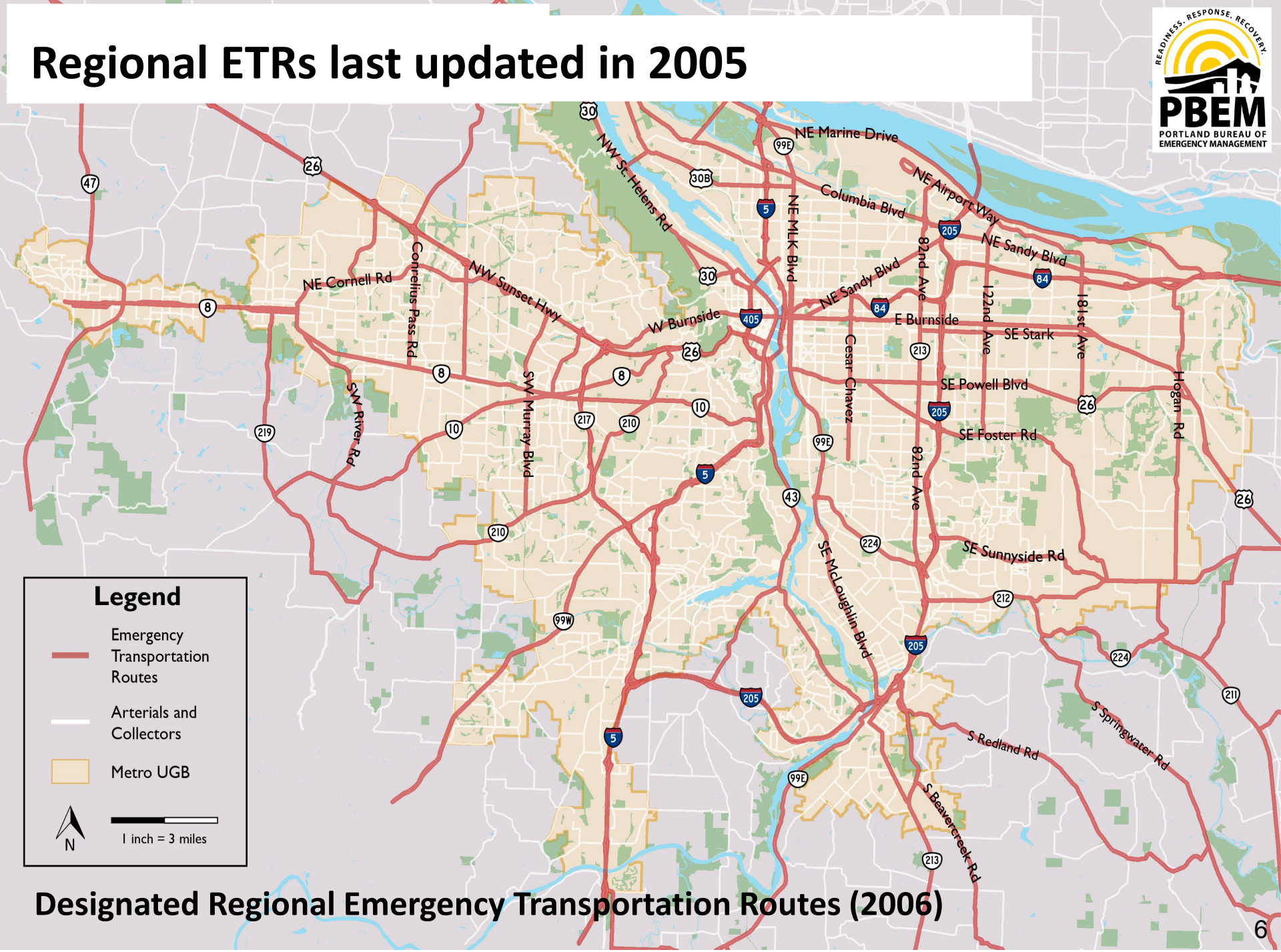
Criteria to select regional ETRs in 1996

- State routes
- relatively flat, with low slide potential
- serve a major population center
- offer at-grade alternative routing at over/ underpasses



Designated Regional Emergency Transportation Routes (1996)

Regional ETRs last updated in 2005



Designated Regional Emergency Transportation Routes (2006)

Scope of this effort

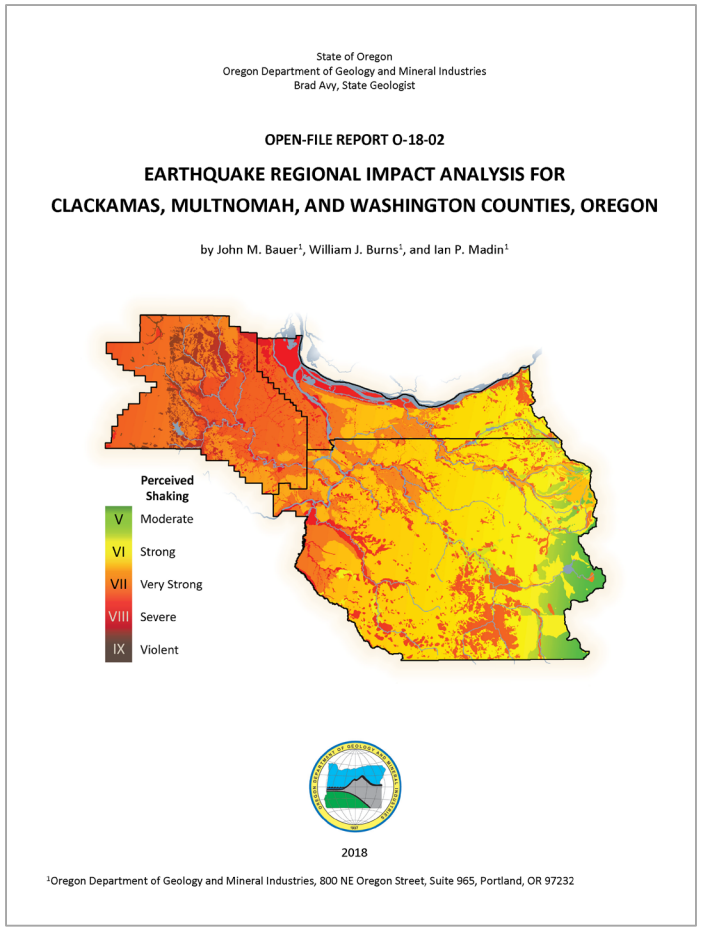
- Portland-Vancouver metropolitan area
  - 5 counties in Oregon and Washington
  - ~50 incorporated cities
- Working together as a region
- Leveraging existing plans, policies, data, analysis and processes

Progress to date in 2019

- Awarded UASI grant funding (~$160K)
- Formalized partnership and project charter with the Regional Disaster Preparedness Organization
- Defined contractor scope with ETR working group of emergency management and transportation staff
- Started PSU/TREC graduate assistant background research

Related work in 2019

- ODOT and counties review of existing State Lifeline routes and local ETRs
  - Clackamas (completed)
  - Washington and Columbia (under way)
  - Multnomah (just started)
- Portland completed their local ETR review in 2018
- DOGAMI finalizing analysis for Columbia and Clark counties


State of Oregon
Oregon Department of Geology and Mineral Industries
Brad Avy, State Geologist

OPEN-FILE REPORT O-18-02

EARTHQUAKE REGIONAL IMPACT ANALYSIS FOR
CLACKAMAS, MULTNOMAH, AND WASHINGTON COUNTIES, OREGON

by John M. Bauer[1], William J. Burns[1], and Ian P. Madin[1]

Perceived Shaking
V Moderate
VI Strong
VII Very Strong
VIII Severe
IX Violent

2018

[1]Oregon Department of Geology and Mineral Industries, 800 NE Oregon Street, Suite 965, Portland, OR 97232

www.oregongeology.org/pubs/ofr/p-O-18-02.htm

Desired outcomes from planning process

- Deliver updated data and map of regional ETRs
- Raise awareness and visibility of ETRs
- Understand the resilience of ETRs
- Increase collaboration across many disciplines
- Strengthen regional partnerships
- Develop recommendations for future work and collaboration around transportation resilience and recovery

Regional Emergency Transportation Routes Update

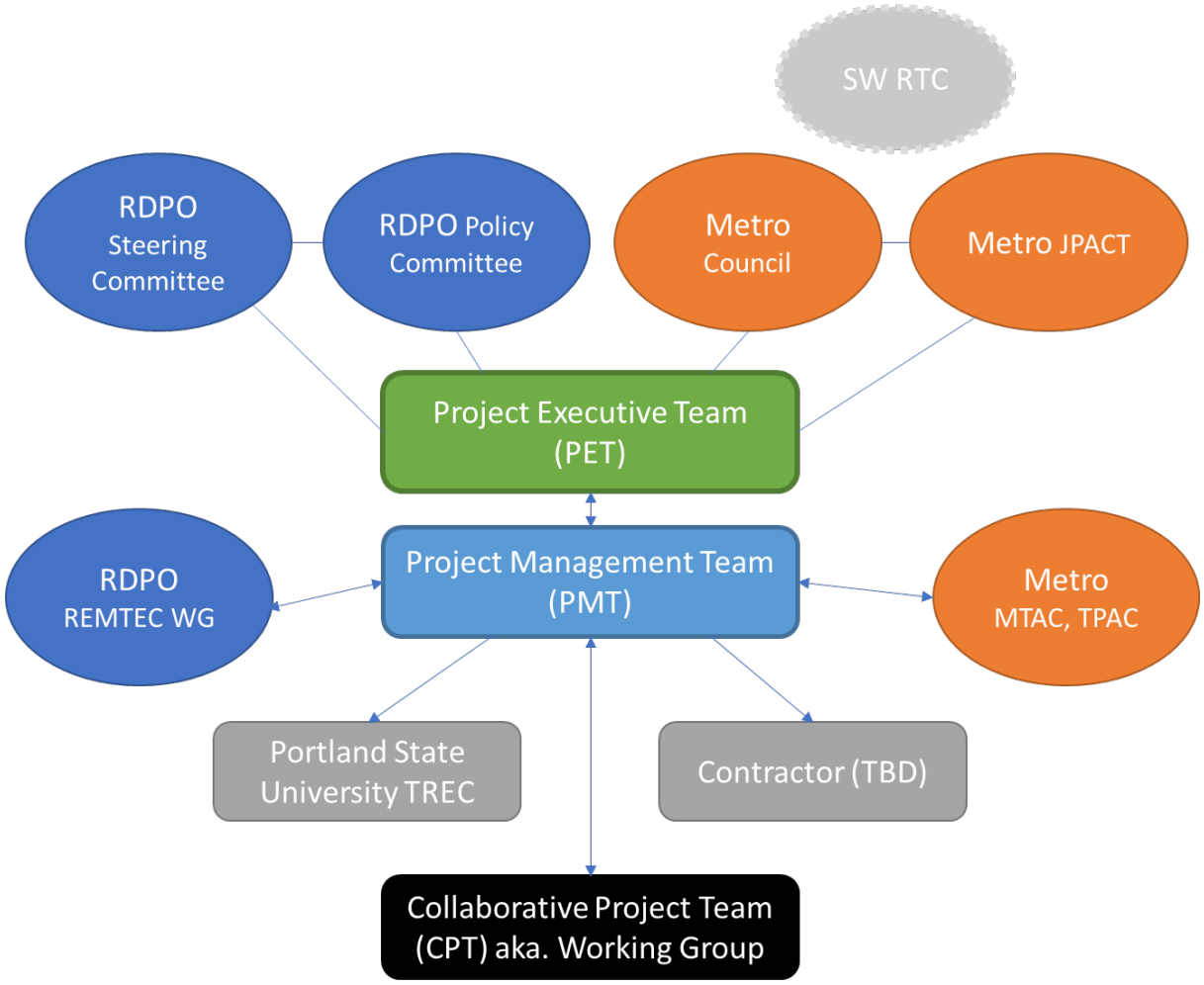
Decision-making

Project will rely on existing RDPO and Metro policy and technical committees and work groups

Multi-disciplinary

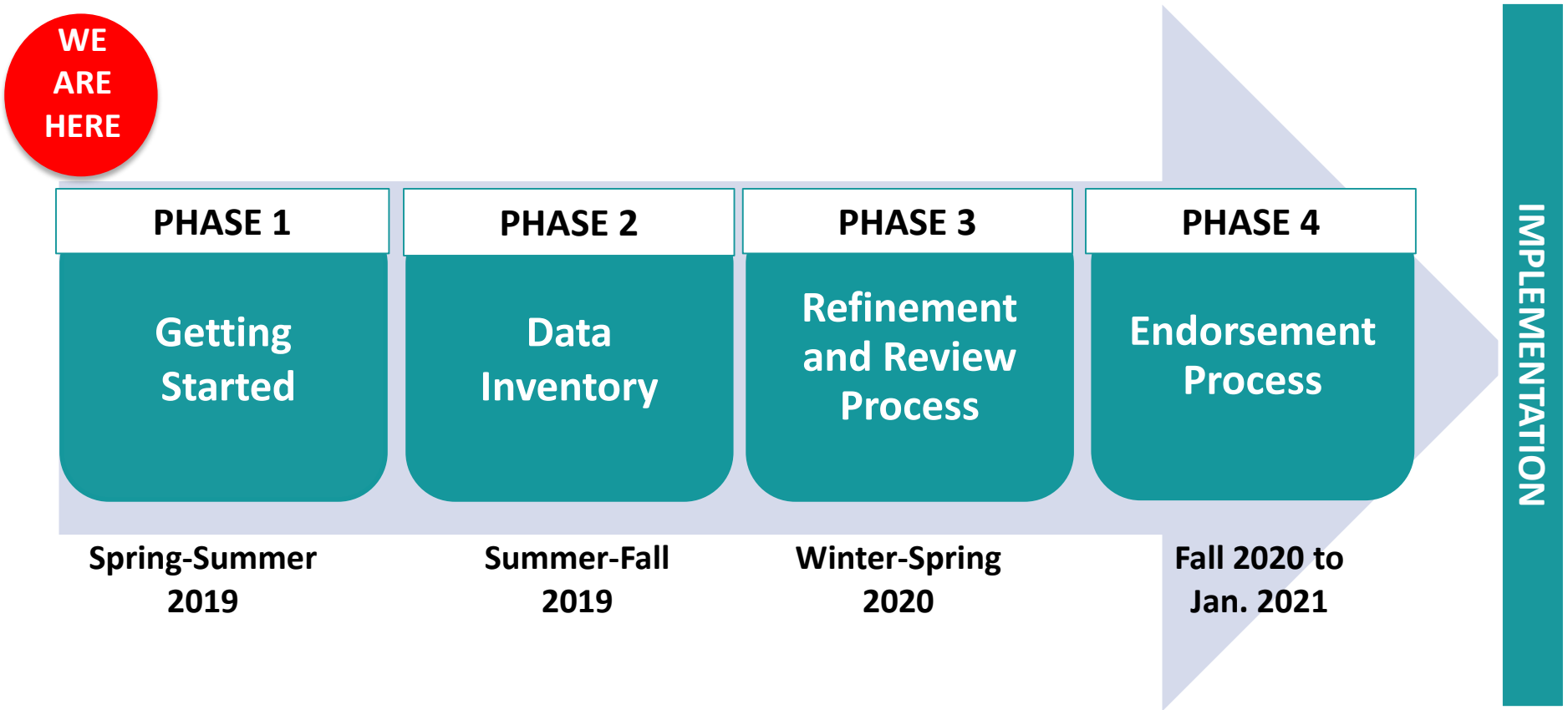
Multi-jurisdictional

Targeted engagement of other key stakeholders



Regional Emergency Transportation Routes Update

Project approach and timeline



Next steps

- Finalize contractor scope and kick-off RFP process
- Contractor recruitment – your help is needed to get the word out
- Finalize stakeholder engagement strategy
- Launch project website
- Gather relevant plans, policies, data and best practices
- Report back in the fall

Today's discussion

- What should RDPO and Metro consider as we begin this project?
- Regional ETRs need to: _____
- Regional ETRs should connect: _____
- What opportunities do you see with this project?
- What questions do you have about this project?
- Anything else you want to tell us?

PLEASE LEAVE YOUR WRITTEN RESPONSES ON BACK TABLE
(or send via email to Kim and Laura)

Questions?

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Kim Ellis, Metro

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RDPO
Regional Disaster Preparedness Organization
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