TRIMET

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2020

TriMet
Pedestrian Plan

Acknowledgments

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TRIMET

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- Community members who provided meaningful input that improved this Plan's focus and outcomes.
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Project Funding

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Photo source cover, following page: TriMet

Table of Contents

Dear partner,

Every transit rider, whether they walk or roll, is a pedestrian at some point during their transit trip. The vast majority of TriMet's riders—about 86% of them—tell us that they walk to their stop or station to begin their journey aboard transit.

As an agency in the mobility business, we care about whether our riders can safely, easily and comfortably access our transit service. Addressing the barriers to riding transit is part of this effort to make riding transit possible for some and easier for others. In July 2018, TriMet rolled out a Low-Income Fare program that dramatically reduced the financial barriers to riding transit faced by some of our riders. While the Low-Income Fare has chipped away at financial barriers, we know that many riders, particularly low-income riders and riders with disabilities, still encounter physical barriers, such as missing sidewalks and dangerous crossings, on their walk to the bus stop, or MAX or WES station.

We also know that cities, counties and the Oregon Department of Transportation care deeply about improving how residents, our customers, can walk safely to transit and other important destinations. For decades, we've been collaborating with them on making that first step aboard transit better. Most recently, in 2011, we undertook a Pedestrian Network Analysis that offered practical suggestions for changes in ten key locations across our region.

Grounded in the principles of safety, equity, and demand, TriMet's Pedestrian Plan takes this work one big step further. Informed and guided by community members, organizations, advocates, employers, and the cities and counties in our region, and harnessing new methods and new data, the Pedestrian Plan offers jurisdictions a data-driven and consistent access-to-transit lens through which to evaluate future pedestrian projects. We hope that this document will help inform local, regional and state project selection and funding decisions, ensuring that investments serve both local and broader regional needs.

We are excited about how the Pedestrian Plan can move the conversation on access to transit forward and can lead to real change on the ground for people walking and rolling to transit.

Let's get to work together.

Doug Kelsey
TriMet General Manager

Part 1

Executive Summary

Executive Summary

SHAPING THE PLAN

The TriMet Pedestrian Plan identifies priorities for improving walking and rolling access to transit across the TriMet service area. The service area encompasses 26 cities in three counties in the Portland Metro region.

Mapping, analyses, and community and agency input guided the formation of a pedestrian project list and recommended strategies.

The Plan better enables TriMet and agency partners to work together to improve the safety and comfort of people walking and rolling to access transit, through a variety of different planning processes:

- Transportation Plans
- Project Development and Implementation
- Grant Applications
- Policy and Program Development
- Community Engagement

Source: TriMet

LISTENING TO THE COMMUNITY

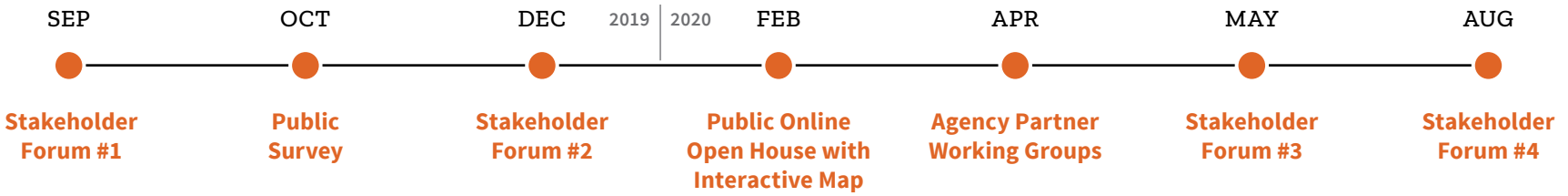
The engagement process for the TriMet Pedestrian Plan had two objectives: understanding what issues exist for pedestrians accessing transit and hearing the comunity's ideas about how those issues might be addressed.

TriMet offered multiple opportunities and formats for listening to both transit riders and community members, including stakeholder forums, agency partner working groups, an online survey, and an online open house.

The first Stakeholder Forum, held in September 2019, established key shared values and an initial framework for prioritizing pedestrian improvements throughout the TriMet Service District.

VALUES

- Equity *including racial equity, ability (ADA), income, and age*
- Creating opportunities that are responsive to community needs
- Universal design and accessibility to all
- Collaboration and partnerships
- Safety *including physical and personal safety*



MAPPING PEDESTRIAN ACCESS TO TRANSIT

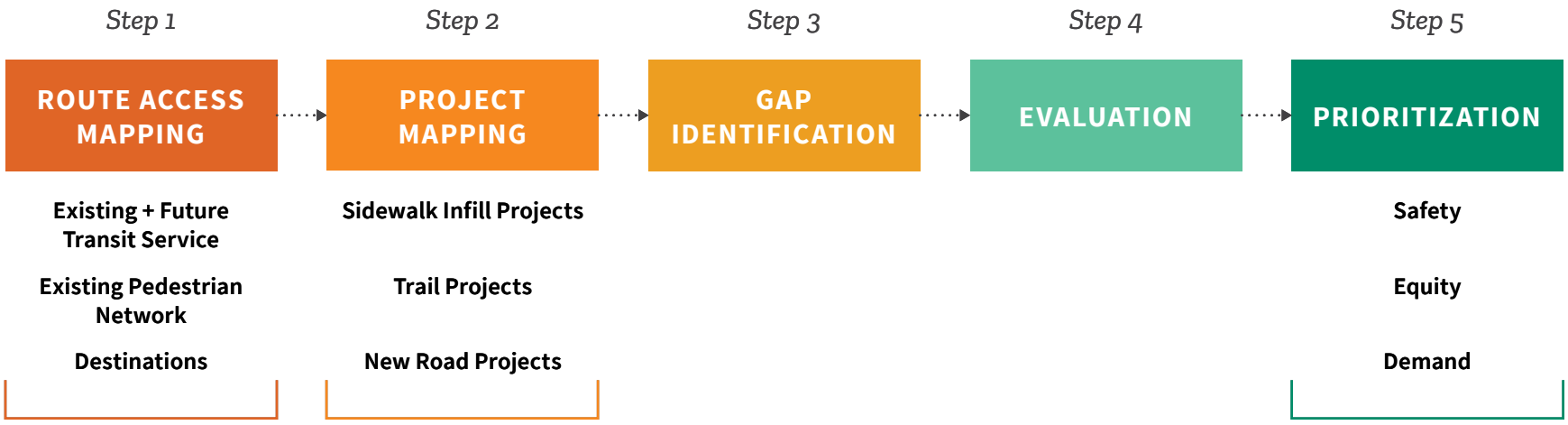
The TriMet Service District contains 26 municipal jurisdictions in three counties, each with their own planning processes or efforts in place to address safety and accessibility for people walking and rolling. The transit network mapping process integrated these efforts into one region-wide inventory of planned improvements that would expand transit walksheds.

For analysis purposes, this plan defined transit walksheds as the area around a transit stop or station that a person can reach by walking or rolling a quarter-mile. Data on existing and proposed networks were used to determine which projects would expand transit walksheds, allowing more pedestrians to access stops and stations.

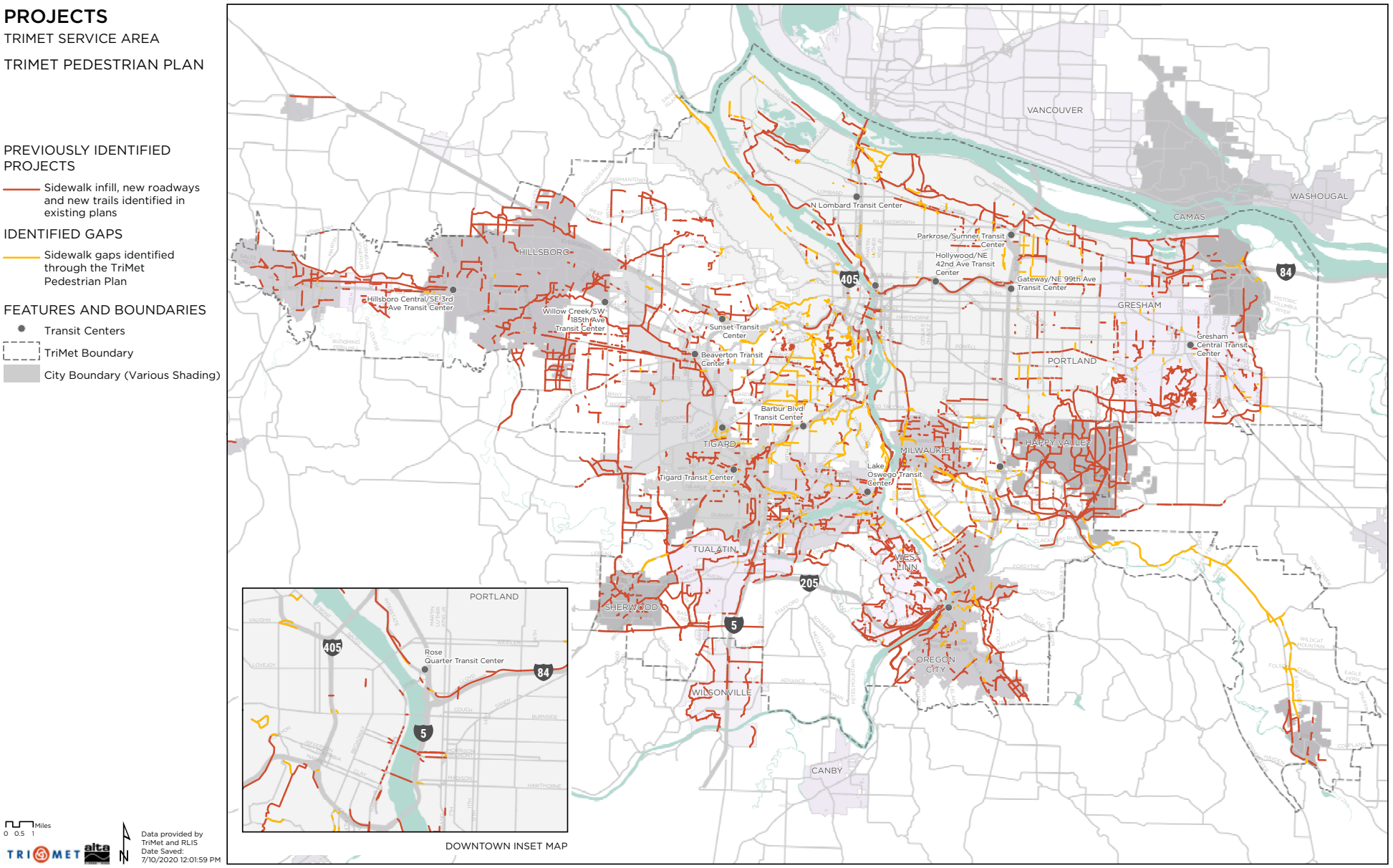
Crossing improvements are critical to pedestrian access to transit in the TriMet service area. However, this project's mapping analysis does not include crossing infrastructure or crossing gaps, because regionwide data do not currently exist for types of crossings. This means that only existing and proposed sidewalk and trail improvements are mapped, and that each of these linear projects must be scoped and funded to include crossing treatments.

See Appendix G for full size maps from the five-step mapping analysis.

Figure 1 The Plan's Five-Step Mapping Analysis



Map 1 Projects

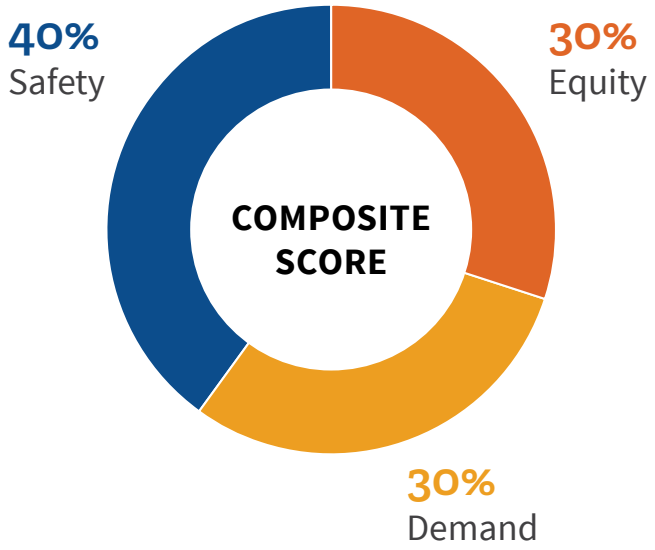


For the full 11.5” X 17” map, please refer to Appendix G

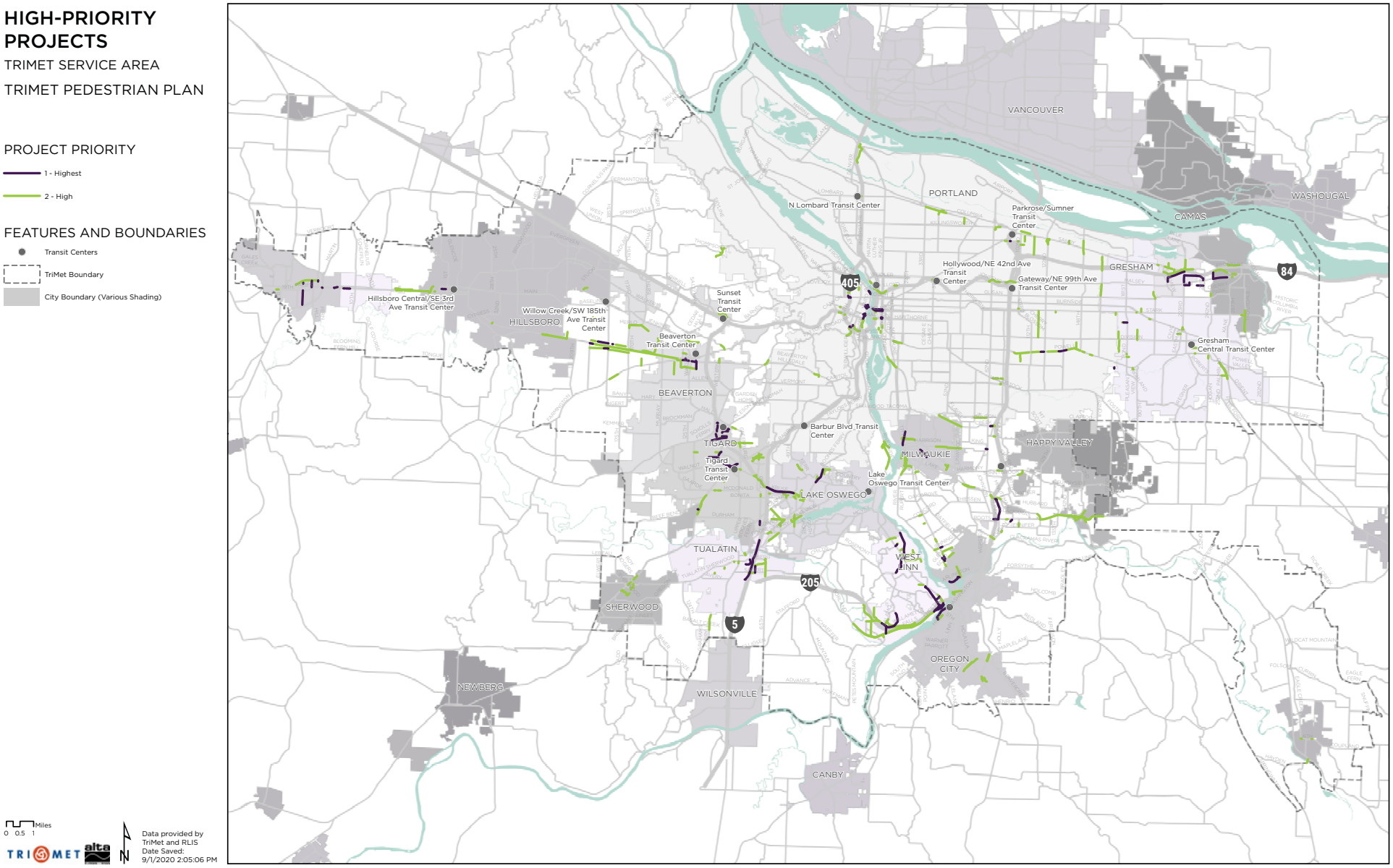
Source: Metro

PRIORITIZING PEDESTRIAN GAPS

Based on community, stakeholder, and agency input, TriMet established three overarching prioritization criteria—safety, equity, and demand—to prioritize potential pedestrian infrastructure projects. The results of the online open house and the agency working groups indicated a need to slightly increase the weight of safety when measuring projects' priority level (as shown below).



Map 2 High-Priority Pedestrian Projects



For the full 11.5” X 17” map, please refer to Appendix G

IDENTIFYING NEXT STEPS

As the Portland region's primary transit service provider, TriMet's influence over the physical environment generally begins and ends at a transit stop or station. Because partner agencies have more influence over how multi-modal transit riders access their stop or station, it is necessary to define clear roles and collaborate to achieve common goals across all project types.

Moving forward, TriMet and agency partners, including counties and local jurisdictions, should focus on the following strategies and actions to expand work already underway, increase resources, and improve outcomes:

- **Plan for greater investment in the needs of people walking and rolling to transit**
  - Incorporate the TriMet Pedestrian Plan priorities into Transportation System Plans and modal plans
  - Align infrastructure funding with priorities for pedestrian access to transit
  - Collaborate for regional investments in pedestrian access to transit
  - Track and evaluate improvements to pedestrian access to transit
- **Make more walking and rolling trips to transit possible**
  - Close sidewalk and trails gaps within transit walksheds
  - Prioritize adding marked and enhanced crossings within transit walksheds
  - Develop local guidance to implement policies regarding the co-location of crossings with transit stops and stations
  - Create universally accessible routes to transit
- **Make walking and rolling trips to transit safer and more comfortable**
  - Apply current best practices in pedestrian design
  - Include pedestrian-scale lighting within transit walksheds
  - Design for personal safety and security for people walking and rolling to transit
  - Improve the legibility of navigating on foot or by mobility device to and from transit stops
- **Better coordinate and communicate on pedestrian improvements**
  - Share technical resources for implementing this Plan
  - Engage each other as stakeholders in project delivery
  - Generate community awareness of the Plan

Part 2

How to Use This Plan

How to Use This Plan

Audiences

The TriMet Pedestrian Plan is a technical resource for TriMet agency staff, County, and City staff, regional partners (ODOT, Metro, and others) who are involved in day-to-day transportation and infrastructure decisions, as well as organizations and community members who are interested in improving access to transit where they live, work, and play.

Use Cases

TriMet Pedestrian Plan recommendations can be incorporated into different types of planning processes, including transportation plans, project development and implementation, grant applications, policy and program development, and community engagement. Transportation plans may come in the form of Transportation System Plans (TSPs), modal plans (especially pedestrian and transit plans), small area plans, and corridor studies. These system plans also provide the basis for Capital Improvement Programs and other funding mechanisms.

Plan Resources

Different types of planning processes may need different types of information to best support pedestrian access to transit. The following graphic offers a guide for easily finding the most relevant ready-to-use details from the TriMet Pedestrian Plan effort based on likely pedestrian planning use cases. These ready-to-use details range from the specific data used to identify a sidewalk project to resources for developing a new policy.

If you are...

TRIMET

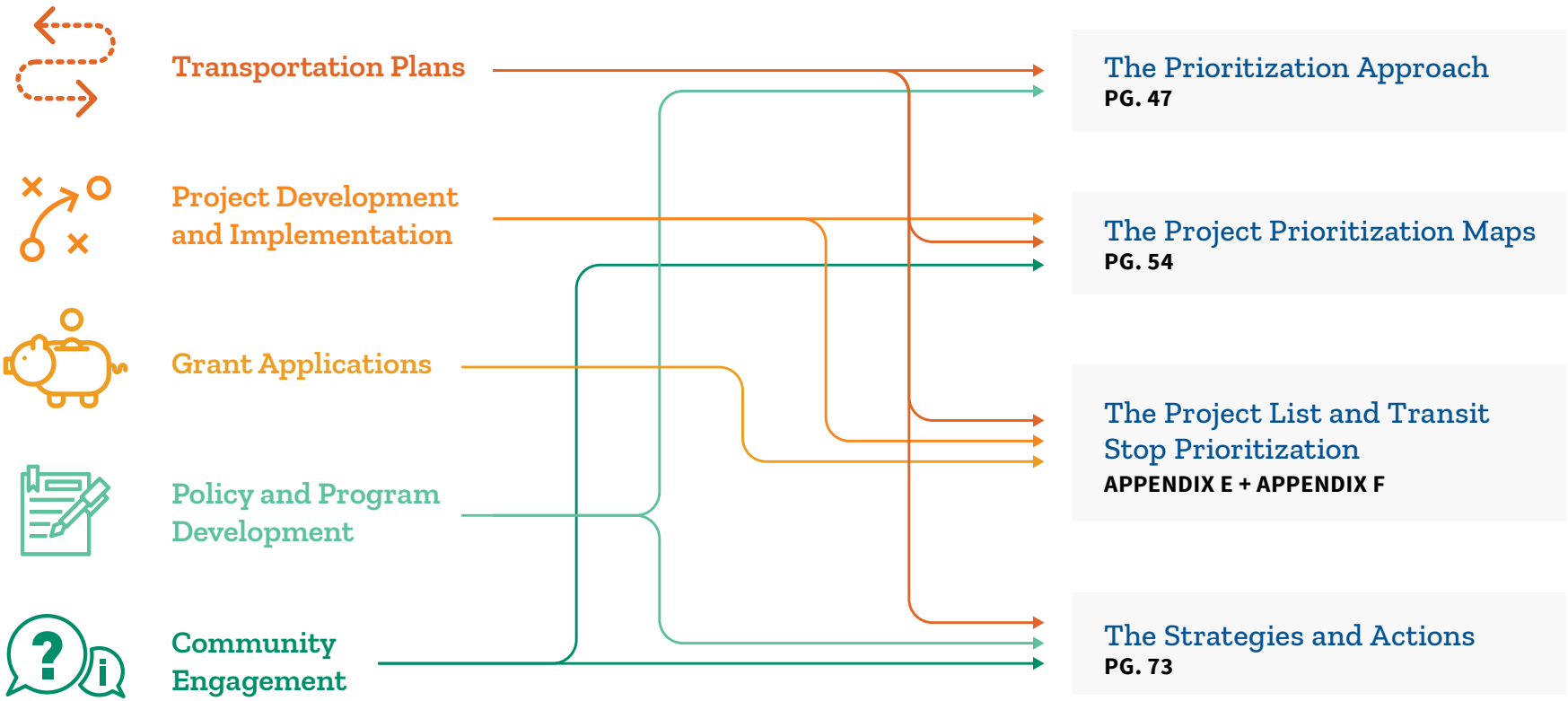
COUNTY + LOCAL AGENCIES

REGIONAL PARTNERS

ORGANIZATIONS + COMMUNITY MEMBERS

Working on...

Please see...



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Ch. 1

What this Plan Can Do

Plan Purpose

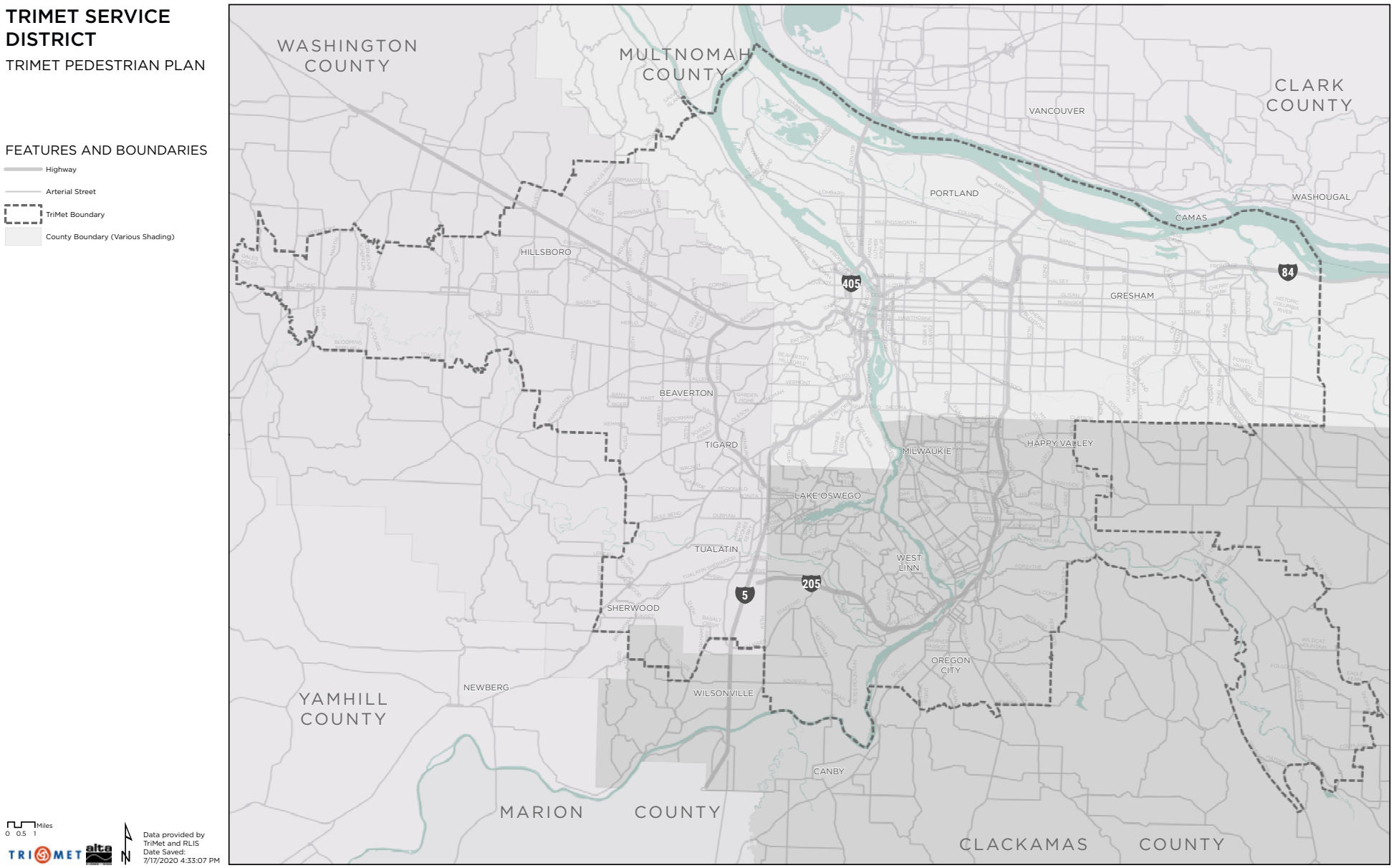
The TriMet Pedestrian Plan identifies priorities for improving walking and rolling access to transit across the TriMet service area. The Plan's recommendations:

- Provide a common resource for TriMet and agency partners,
- Assist in prioritizing local roadway jurisdiction investments in pedestrian infrastructure,
- Support funding requests and program development, and
- Establish a dynamic tool for agency efforts and future collaboration.

As an agency, TriMet provides bus, light rail, commuter rail service, and paratransit service (LIFT). These transportation options connect people with their community, while easing traffic congestion and reducing air pollution. TriMet serves the greater Portland Metro region, which encompasses 26 cities. As shown in Map 3, portions of Clackamas, Multnomah, and Washington counties are included within the service area.

Source: Metro

Map 3 TriMet District Boundary



For the full 11.5” X 17” map, please refer to Appendix G

This Plan focuses on making pedestrian trips to and from transit a better, safer, and more universally available option. A pedestrian is defined as anyone who walks and rolls (which includes people using mobility devices, strollers, skateboards, or scooters). When we refer to access to transit, we are referring to the physical ability of pedestrians to walk or roll to and from transit on safe, dedicated pedestrian infrastructure that includes complete sidewalks, accessibility for persons with mobility differences, pedestrian crossings, trails connections, lighting, and other streetscape improvements. The area within which a pedestrian is expected to access a transit stop/station is called the "walkshed" or "access shed." Ultimately, a successful transit system relies on the ability of people to reach it. While TriMet leads transit service planning, provision, and operations, their jurisdictional partners –the cities and counties that own and maintain the right-of-way- typically lead the planning and provision of street improvements that affect how a person travels to or from their nearest transit stop. The TriMet Pedestrian Plan provides guidance for how these different agencies can work together to create an effective and efficient region-wide transportation network that is accessible for pedestrians.

Source: TriMet

Policy and Institutional Framework

As TriMet and agency partners work to improve pedestrian access to transit, they are advancing a set of common policy goals and transportation planning objectives. The Pedestrian Plan's policy and planning goals are consistent with state and regional policy, and by extension, underlying policy and planning undertaken by local partners. This policy concurrency helps to ensure that planning, design, and development are carried out in a coordinated, consistent, and comprehensive way across implementing agencies. This plan supports regional and local transportation plans and does not replace them.

While TriMet has always valued the ability and experience of those accessing their services, until recently pedestrian planning at TriMet has largely occurred under a different name or implicitly as part of other efforts. In particular, much of TriMet's earliest pedestrian-related planning occurred within the context of bus stop planning and focused on the interaction between the pedestrian and the bus stop. The TriMet Pedestrian Plan explicitly highlights the importance of pedestrian access to transit and outlines how TriMet Agency staff, County, and City staff, regional partners (ODOT, Metro, and others), and transit riders around the region can work together to address pedestrian infrastructure gaps in the areas with the highest need and take advantage of other roadway projects to implement needed improvements.

The TriMet Pedestrian Plan builds upon earlier TriMet agency guidance on transit-pedestrian interactions:

- Planning with Transit, 1979
- Planning and Design for Transit: Guidelines for Implementing Transit Supportive Development, 1996
- Pedestrian Connection Analysis Project, 2002
- Pedestrian Network Analysis, 2011
- Bus Stop Guidelines, updated 2010
- TriMet Design Criteria Manual, updated 2017
- Coordinated Transportation Plan for Elderly and People with Disabilities 2020

Many state, regional, and local plans adopted by agency partners relate to the pedestrian and transit systems within TriMet's service area. Among those, the following three establish goals and performance targets that most closely align with the purpose of the TriMet Pedestrian Plan:

- Oregon Public Transportation Plan (ODOT)
- Regional Transportation Functional Plan (Metro)
- Regional Active Transportation Plan (Metro)

Chapter 5 identifies the specific policy goals and guidance of those plans that correlate to the recommendations of this effort. A policy nexus is identified for each proposed strategy and action of this Plan.

Beyond those three foundational documents, the following plans provide historical references or serve as companions to the TriMet Pedestrian Plan. These plans are examples of agencies and jurisdictions efforts to deliver on the responsibilities and goals outlined in the previous section.

STATEWIDE

- Oregon Bicycle and Pedestrian Plan

METRO

- Regional Transit Strategy
- Regional Transportation Plan
- Regional Transportation Safety Plan

COUNTY AND MUNICIPAL (EXAMPLES, NOT EXHAUSTIVE)

- Active Transportation Plan, City of Beaverton
- Active Transportation Plan, City of Gresham
- First/Last Mile Connections to Transit, Washington County
- Pedestrian and Bicycle Plan, Washington County
- Active Transportation Plan, Clackamas County
- Growing Transit Communities, City of Portland
- PedPDX, City of Portland

Appendices A and B provide a more detailed summary of the historical background and policy and institutional framework for this Plan.

Return on Investment

Research has shown that investing in pedestrian access to transit has a significant positive return on investment.

Pedestrian improvements are good for business.

Research has shown that businesses see financial benefits when co-located with transit and walkable places. For example, a 2019 study[1] found that food service employment and other economic metrics improved in several U.S. cities after active transportation projects were completed nearby. A Smart Growth America study[2] found that trips by foot, bicycle and transit almost always increased following Complete Streets improvements. This generates more revenue for transit agencies, and increased foot traffic means more customers for area businesses.[3]

Multimodal networks provide choice and increase equity.

Having a multimodal transportation system provides greater choice for people who rely on transit to get around. Investments in sidewalks for transit access increase the mobility options available to the elderly, young, and disabled. These improvements also specifically benefit people without cars or other means to access stops and stations, providing greater access and saving them money on transportation costs.

Investments in active transportation infrastructure are both cost-effective and fiscally rewarding.

Active transportation improvements (such as sidewalks, crossings, and bike lanes) make streets more desirable for not only pedestrians but also private investment. Many studies have shown that public investments in pedestrian and bicycle infrastructure lead to economic returns for state and local economies. These benefits include increases in residential property values, tourism, jobs, retail sales, and state and local taxes. In their 2011 study, the Political Economy Research Institute found that bicycle and pedestrian infrastructure projects led to the creation of more jobs than road-only infrastructure projects.[4]

Pedestrian access means safer streets and better health.

After pedestrian improvements are made, collision rates often decline about 40 percent, with corresponding reductions in injuries.[5] This reduction in crashes aligns with shared Vision Zero goals in the region. Vision Zero is a policy adopted by most jurisdictions in the region to provide strategic goals and data to eliminate crashes.[6] These investments not only save lives but are also fiscally sound given the high cost of collisions. In a study of 37 communities, Smart Growth America found that Complete Streets projects averted more than $18 million in collision and injury costs in a single year.[7] In addition to lowering accident rates, a greater pedestrian mode share also means better air quality, less congestion, and improved health outcomes from more active lifestyles. In particular, a person's walk to access transit increases their ability to meet daily recommendations for physical activity. Individuals who use public transportation get over three times the amount of physical activity per day of those who don't (approximately 19 minutes, rather than six minutes) by walking or rolling to stops and final destinations.[8]

Ch. 2

What We Heard from You

Listening to Transit Riders and Partners

The engagement process for the TriMet Pedestrian Plan had two objectives: to understand what challenges pedestrians face in accessing transit and to hear how riders thought the walk to transit could be improved. TriMet offered multiple opportunities and formats for listening to both transit riders and community members. TriMet additionally sought input from agency partners and jurisdictions about the mechanisms through which improvements are made. Public outreach captured extensive feedback from transit riders and a broad swath of stakeholders including elected officials, civic and business organizations, and residents.

Outreach to agency and jurisdiction partners emphasized process, resources, and collaboration.

Outreach for the plan took place over about nine months (from fall 2019 to summer 2020) and included the following major elements:

- Stakeholder Forum
- Online Survey
- Online Open House
- Agency Partner Working Groups

Understanding Pedestrian Challenges

Overview

The initial phase of the public outreach process sought to identify the primary challenges transit users face accessing stops and stations by foot or using a mobility device, and to establish shared values to guide the approach for addressing those identified challenges.

TriMet established a Stakeholder Forum, which met four times from fall 2019 through summer 2020 to advance a region-wide conversation about pedestrian access to transit. An online and printed survey allowed the public, particularly transit riders, to provide insights into the barriers they face when walking or rolling to transit and their ideas for improvements. TriMet aligned this public outreach with broader engagement for their Unified Service Enhancement Plan, enabling region-wide promotion online and distribution at in-person open house events.

KEY FINDINGS

- Equity, safety and universal accessibility are region-wide values that should drive investment in pedestrian access to transit.
- The majority of people accessing transit do so by foot.
- Gaps in existing pedestrian infrastructure and amenities, and concerns over safety are region-wide barriers for pedestrians using transit.

What We Heard

The first Stakeholder Forum, held in September 2019, established key shared values and an initial framework for prioritizing pedestrian improvements throughout the TriMet Service District. The meeting included 18 stakeholders and consisted of staff representatives from cities and counties in TriMet's service district, representatives from organizations serving communities of color, refugees, and immigrants; members of pedestrian advocacy groups; and representatives from large employers, community colleges, and TriMet's Committee on Accessible Transportation (CAT) and the Transit Equity Advisory Committee (TEAC).

After discussing in small groups, participants created a list of compiled values and then voted individually for those they felt were most important. Based on this process, the top values or concepts identified were:

Equity
including racial equity, ability (ADA), income, and age

Creating opportunities that are responsive to community needs

Universal design and accessibility to all

Collaboration and partnerships

Safety
including physical and personal safety

In October 2019, TriMet conducted a survey that asked transit users about their experience walking to transit stops and stations and specific barriers that they face. Respondents provided comments on their transportation habits, concerns about walking to and from stops, and the types of improvements that would encourage them to make these trips on foot.

This survey collected over 1,300 responses from across the region. As shown in Figure 2, the results illustrate that a large proportion of transit users currently access stops and stations on foot, and an abundance of opportunities exist for enhancing the safety and comfort of these users.

The majority of survey respondents reported that they walk to access their stop, highlighted in Figure 3. Additionally, nearly half of respondents are walking or rolling to and from destinations and transit every day of the week.

Figure 2 Modes Used to Access Transit

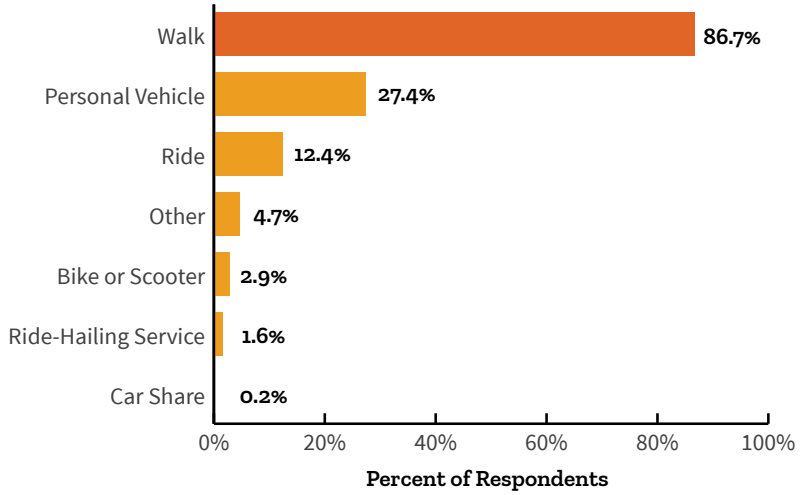
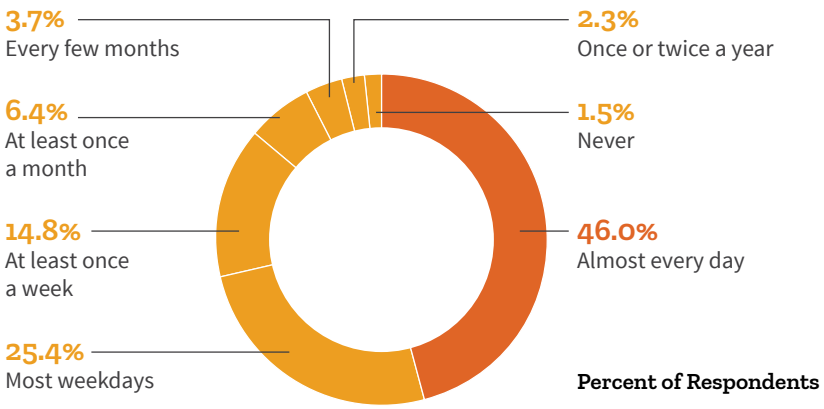


Figure 3 Frequency of Walking to Access Transit



As shown in Figure 4, the principal concerns emerging from this survey included the need for safer and more complete pedestrian infrastructure (including sidewalks, crossings, and street lighting), the distance required to reach a stop or station on foot, unpleasant walking conditions, the need for enhanced wayfinding and arrival information, and the comfort and safety of the stops and stations themselves. Just over a quarter of respondents reported that they didn't have any difficulty walking to their stop.

The survey indicated that there is significant opportunity to enhance the experience for pedestrians accessing transit, which survey respondents said would increase their use. While some of these opportunities involve changes to the TriMet system (including higher frequencies, a higher density of stop locations, and enhanced amenities at stops), many were concerned with the accessibility of transit stops by foot and cited a need for safer crossings, better lighting, and sidewalks near transit. In addition to these comments, many respondents indicated that improved pedestrian conditions would encourage more walking to transit and more walking to travel overall.

Figure 4 Common Issues Faced when Accessing Transit

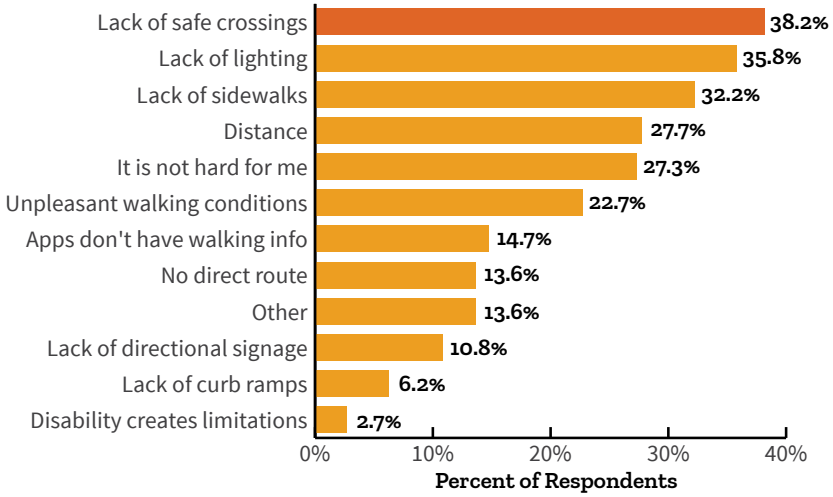
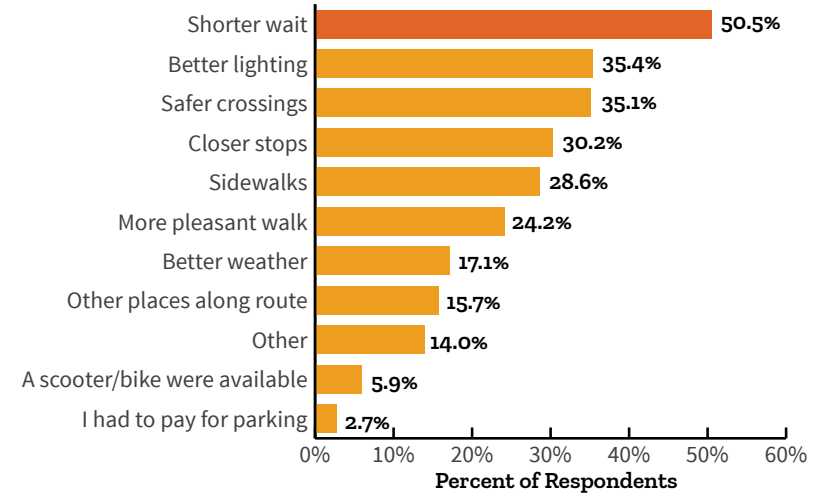


Figure 5 What Would Prompt More Frequent Walks to Transit



Setting Pedestrian Priorities

Overview

With the challenges identified, the second phase of the outreach process focused on the framework for prioritizing pedestrian improvements through a transit-specific lens. This included a series of Agency Partner Working Group sessions, as well as an Online Open House inviting the public to weigh in on the Pedestrian Plan's proposed key values of safety, equity and demand.

KEY FINDINGS

- Safety is the top priority for both agency stakeholders and the public.
- There is overlap among the three key values of safety, equity and demand, and many improvements have the potential to address all of them.

What We Heard

In February and March 2020, TriMet held an Online Open House to gather input for developing TriMet's Pedestrian Plan. TriMet advertised the 3-week long Online Open House directly to riders through emails and the Trimet.org website. Participants could learn about the plan, show how they would prioritize the core project values of equity, safety, and demand, and use a virtual map to identify locations where they encounter barriers in accessing transit, shown in Figure 6.

The Online Open House received a total of 275 visitors and 240 open ended comments. Portland was the most heavily represented individual city. Below are themes and key takeaways based on the nature and content of participants' comments:

- **Safety** was identified as the highest priority across all three counties.
- **Equity** and **demand** were both identified as medium-high priority for respondents in all three counties.
- **Safety** was also noted as an equity issue because traffic creates a disproportionate risk for people of color and people with lower incomes.
- Most respondents commented on a specific site but identified multiple barriers faced by pedestrians connecting with transit.
- Stops across the counties received similar comments, implying that pedestrians across the region tend to face the same issues in accessing transit.

The two most commonly cited barriers to pedestrian access to a transit stop or station were:

- **Crossings:** Unsafe, missing or not clearly marked (164 comments), and
- **Gaps:** Missing sidewalks, long distances between stops, and lack of connection (103 comments)

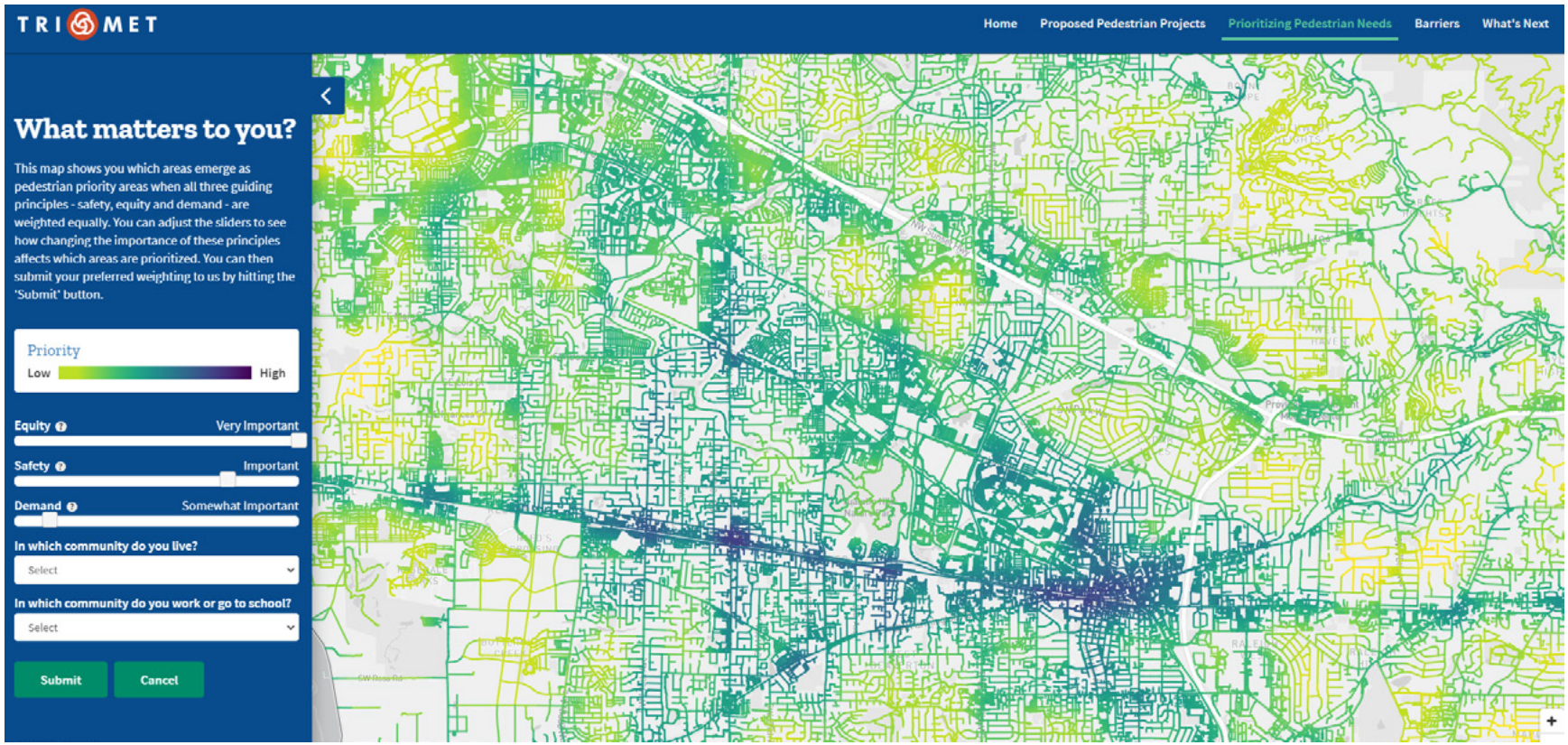
"Major gaps in sidewalk and unsafe stretches from the high-density area on SW Broadway Drive from SW 9th Avenue down the hill to any downtown bus or rail stop is a major impediment for folks in this area to use transit."

– ONLINE OPEN HOUSE COMMENT ABOUT PORTLAND TRANSIT STOP AT SW BROADWAY & LINCOLN

"Conditions at this and stops further west all have similar safety issues. It's essentially a four-lane highway that requires community members coming from the north to cross to access the bus to go into the city. **It's incredibly dangerous and even more so without sidewalks and shoulders.**"

– ONLINE OPEN HOUSE COMMENT ABOUT BEAVERTON TRANSIT STOP AT SW CANYON ROAD & 73RD

Figure 6 The Online Open House provided interactive maps of access to transit projects, including the ability to toggle the weighting of three draft prioritization criteria to see in real-time how prioritization scores would change across the region.



The project team used the results of Online Open House to adjust the prioritization process, in collaboration with project partner agencies. In April 2020, TriMet hosted two Agency Partner Working Group sessions with technical and planning staff from jurisdictions. The project team shared the results from the public outreach along with the updated prioritization process and results. The representatives from three counties and 16 cities who attended the two meetings, along with ODOT and Metro, discussed the effectiveness and local relevance of the prioritization framework.

Agency Partner Working Group participants worked together to identify factors and issues that inform the decision-making surrounding investment in pedestrian improvements. While the majority of participants emphasized that safety should be the first priority, there was also agreement that equity and demand should be crucial factors in project selection.

Participants also recognized that there is considerable overlap between these priorities. For example, areas with high crash rates are often located along transit routes with high ridership, or are located in neighborhoods with higher proportions of low-income residents/residents of color, or communities with limited English proficiency.

Input from agency partners during these working groups led to:

- the final confirmation of the prioritization model,
- updates and corrections to project mapping data,
- new considerations for calculating the score of long regional trail segments,
- new clarifications for projects that cross over jurisdiction boundaries, and
- new clarifications and resources related to crossing infrastructure as a priority of this Plan.

Source: TriMet

STAKEHOLDER FORUM PARTICIPANT AFFILIATIONS

Oregon Department of Transportation (ODOT)

Metro

Clackamas County

Multnomah County

Washington County

City of Portland

City of Tigard

City of Gresham

City of Beaverton

City of Milwaukie

Oregon City

Oregon Department of Land Conservation and Development

AARP

Latino Network

Street Trust

Oregon Walks

Immigrant and Refugee Community Organization (IRCO)

Committee on Accessible Transportation

TriMet Transit Equity Advisory Committee

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Michelle Marx, City of Portland

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Dave Roth, City of Tigard

Jean Senechal-Biggs, City of Beaverton

Brett Setterfield, Clackamas County

Dyami Valentine, Washington County

Michelle Wyffels, TriMet

Dayna Webb, City of Oregon City

Ch. 3

Mapping Pedestrian Access to Transit

Overview

The need for enhanced access to transit for pedestrians is extensive. Given the magnitude of sidewalk and crossing needs throughout the TriMet Service District, it is important to ensure that TriMet and roadway jurisdictions direct resources to locations with the greatest need first. This chapter describes how TriMet identified priority locations for investment by collecting previously identified projects, identifying new linear gaps, and prioritizing all of the projects with a pedestrian access to transit lens.

Benefits of a Data-Based Approach

Prioritizing needs using a data-based approach helps ensure we are directing limited resources to locations with the greatest needs first. It aligns our spending priorities with adopted TriMet goals and policies and the public's stated priorities, and creates a process that is transparent and repeatable.

Furthermore, a data-based approach to prioritizing sidewalk needs helps ensure that we provide needed improvements in an equitable manner across the TriMet Service District, and will empower jurisdictions to make small-scale improvement decisions with a service area-wide lens.

Limitations of Crossing Data

Crossings are part of any pedestrian network, as pedestrians travel both along and across roadways. The risk factors and potential design solutions of sidewalks and trails (along) are different than those of crossings (across). The presence of safe and convenient crossings is especially critical for people walking and rolling to transit, given the fact that most transit trips are roundtrips, meaning that a transit rider needs to cross the street during at least one leg of the trip.

While crossing improvements are a priority investment for pedestrian access to transit in the TriMet service area, this project's mapping analysis, described in detail in this Chapter (Ch. 3) does not include crossing infrastructure or gaps (lack thereof). A regionwide analysis such as the TriMet Pedestrian Plan relies on data that are available for the entire TriMet service area. Regionwide data does not currently exist for the presence of marked crossings or other crossing enhancements such as ADA-compliant curb ramps, signage, or beacons. However, there is an increasing amount of crossing data available in OpenStreetMap. If this data becomes available throughout the region, it will unlock the potential to consistently analyze crossing conditions at and around transit stops within the TriMet Service District.

Additionally, Oregon law recognizes every intersection as a legal "crosswalk" (ORS 801.220), unless prohibited with "crosswalk closed" signage. Analyzing the region's existing crossing environment must account for marked (versus unmarked) crosswalks and a range of other design treatments that may be applicable or necessary based on the specific roadway context (e.g. rectangular rapid flash beacon).

For this reason, only existing and proposed sidewalk and trail improvements are mapped. However, this Plan assumes that every mapped sidewalk and trail improvement may be scoped and funded to include crossing design treatments if appropriate for the project context and if needed to complete the project's connection to transit (see Chapter 5, Strategy 2). A segment of sidewalk or trail that this Plan identifies as a priority project is also a roadway segment that is a priority for crossing improvements as well.

Source: TriMet

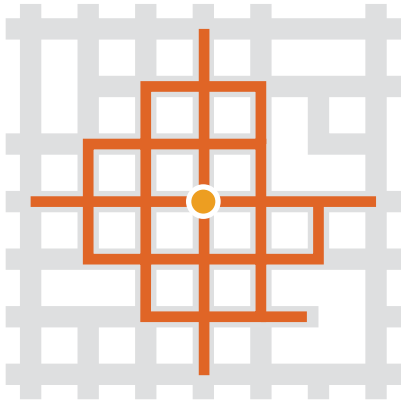
Transit Walksheds

Since this plan is focused on pedestrian access to transit, it is primarily focused on pedestrian needs near existing or proposed transit stops or stations, also known as transit walksheds. For analysis purposes, this plan defined transit walksheds as **the area around a transit stop or station that a person can reach by walking or rolling a ¼ mile.** The walksheds consider network distances (i.e., an existing, viable route) rather than straight line distances (i.e. as the crow flies). The difference between these two can be considerable, especially in areas without a connected street grid.

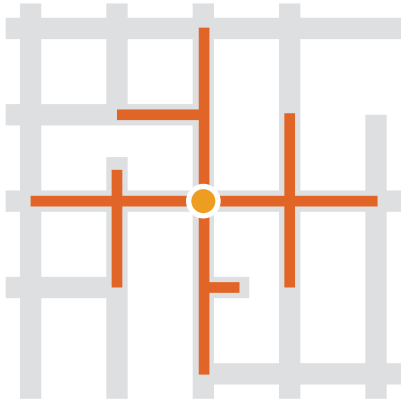
For every existing and future transit stop, a transit walkshed was created using the existing pedestrian network. The process was then repeated using the future pedestrian network, which represents the existing pedestrian network and all of the previously identified projects. By comparing the existing network walksheds to the future network walksheds, a measure of expanded pedestrian access can be calculated.

Figure 7 Variations in Transit Walkshed Networks

Connected Grid



Disonnected Grid

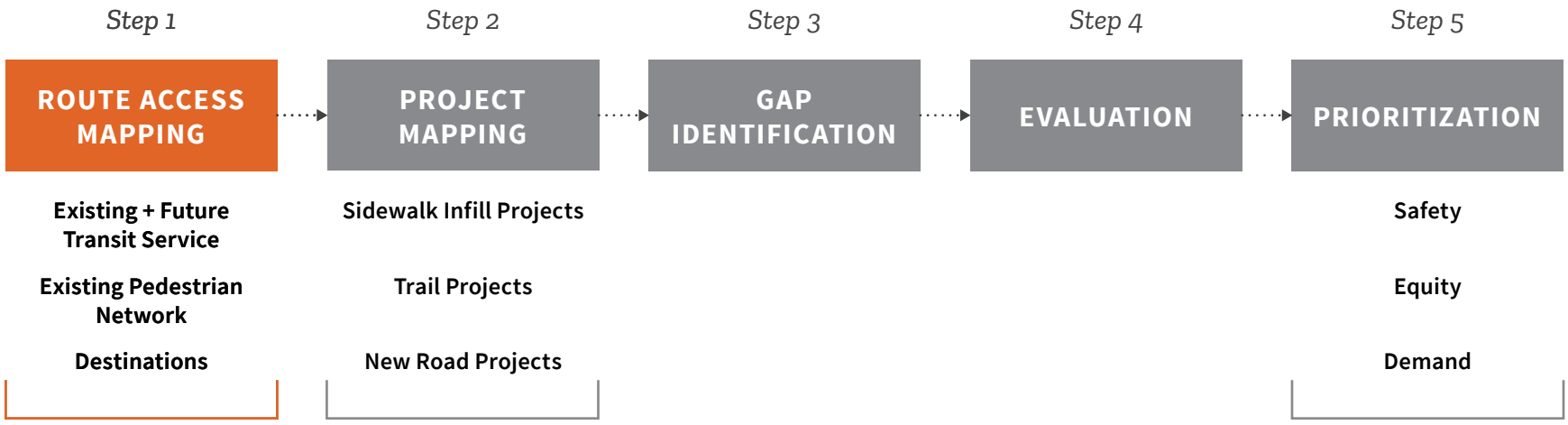


Mapping the Transit Network

The TriMet Service District contains 26 municipal jurisdictions, each with their own planning processes or efforts in place to address safety and accessibility for people walking and rolling. The transit network mapping process integrated these efforts into one region-wide inventory of potential improvements. Through this lens, TriMet and jurisdictions can identify priority locations for pedestrian investment, both at a jurisdictional level and at a region-wide scale. This two-step process analyzed:

- How pedestrians currently access the network of sidewalks to reach transit stops and stations, and
- How proposed pedestrian improvements could increase walking and rolling access to transit.

Figure 8 The Plan's Five-Step Mapping Analysis



The Route Access Map (Map 4) is the result of Step 1 of the mapping analysis process and provides a snapshot of transit in the region. The Route Access Map consists of three elements described below and in Table 1.

EXISTING AND FUTURE TRANSIT SERVICE

This includes existing and planned transit routes throughout the TriMet Service District. Planned routes include the MAX Red Line extension, SW Corridor Light Rail, Division Bus Rapid Transit (BRT), as well as other planned service changes (such as additional routes or improved frequencies) identified in TriMet's Unified Service Enhancement Plan and thus included in the Statewide Transportation Improvement Fund (or STIF, of Oregon's HB2017 Transportation Funding Package).

EXISTING PEDESTRIAN NETWORK

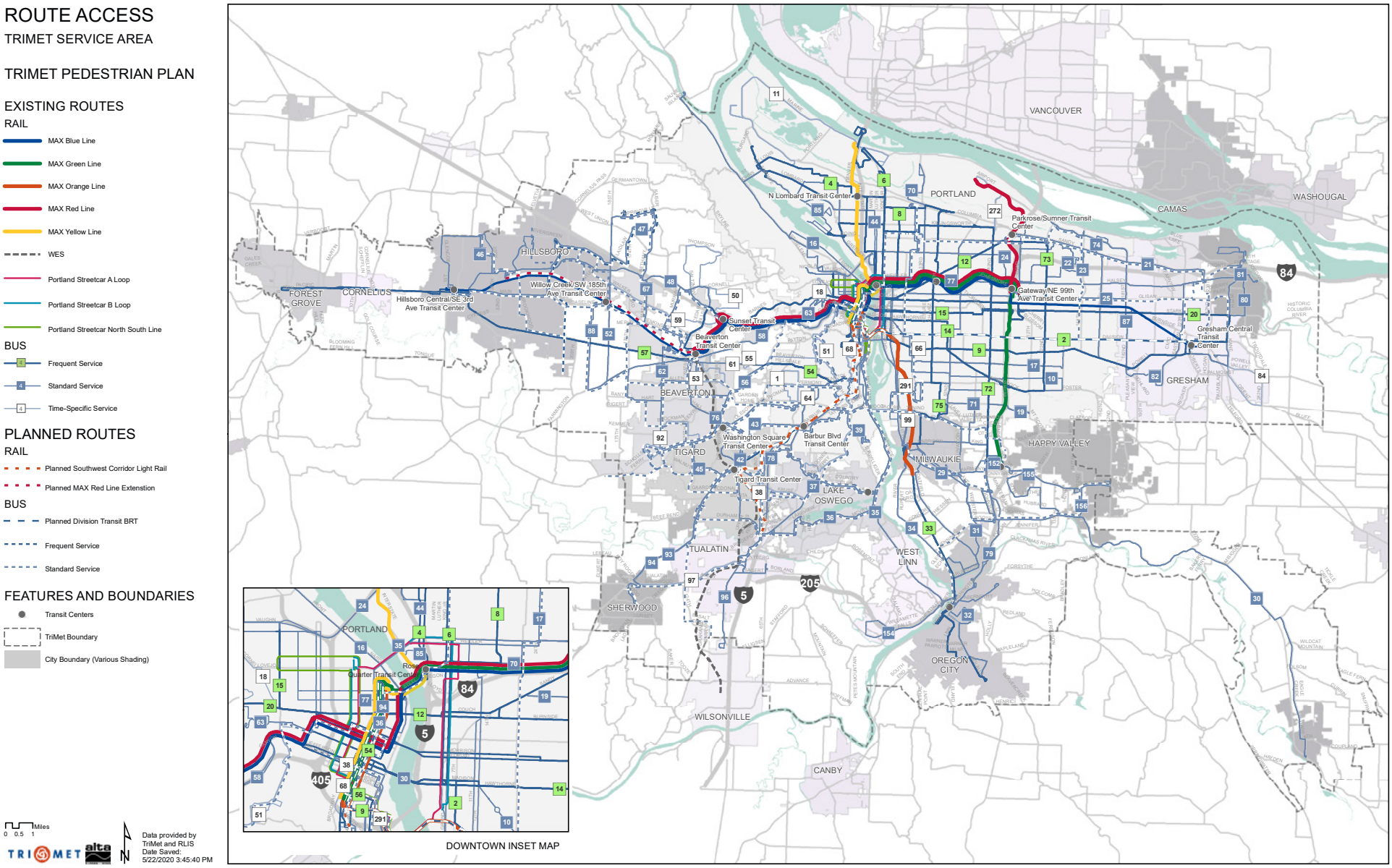
A region-wide sidewalk and pedestrian trail/pathway inventory is mapped using data from TriMet's Mobility on Demand (MOD) Sandbox Project, which supports multimodal trip planning across the region. This inventory was developed in OpenStreetMap and illustrates where pedestrians can currently travel.

DESTINATIONS

This includes roughly 2,000 locations throughout the TriMet Service District that together illustrate demand for transit connections. The locations fell into four categories:

- **Top Attractors:** Major event/activity-oriented destinations in the region, such as the Arlene Schnitzer concert hall and the Oregon Zoo, and the top destinations entered in TriMet's Trip Planner.
- **Services:** Key retail/human/social services that are used in TriMet's Title VI analysis, including grocery stores, nonprofits, health services and more.
- **Major Employers:** All employment locations with 200+ employees.
- **Institutes of Higher Education:** All educational facilities with 400+ students.

Map 4 Existing and planned (per TriMet's Unified Service Enhancement Plan) transit routes throughout the TriMet Service Area.



For the full 11.5" X 17" map, please refer to Appendix G

Table 1 Route Access Mapping Elements

CATEGORY	INPUTS		SOURCE
Existing and Future Transit Service	Existing: •MAX Lines •WES •Streetcar •Bus lines (frequent, standard, time-specific service)	Planned: •MAX Red Line extension •SW Corridor Light Rail •Division Transit BRT •Bus lines (frequent, standard service)	TriMet
Existing Pedestrian Network	Regionwide existing sidewalk and pedestrian trail/pathway inventory		OpenStreetMap
Destination	Top Attractors Services Major Employers Institutes of Higher Education		TriMet

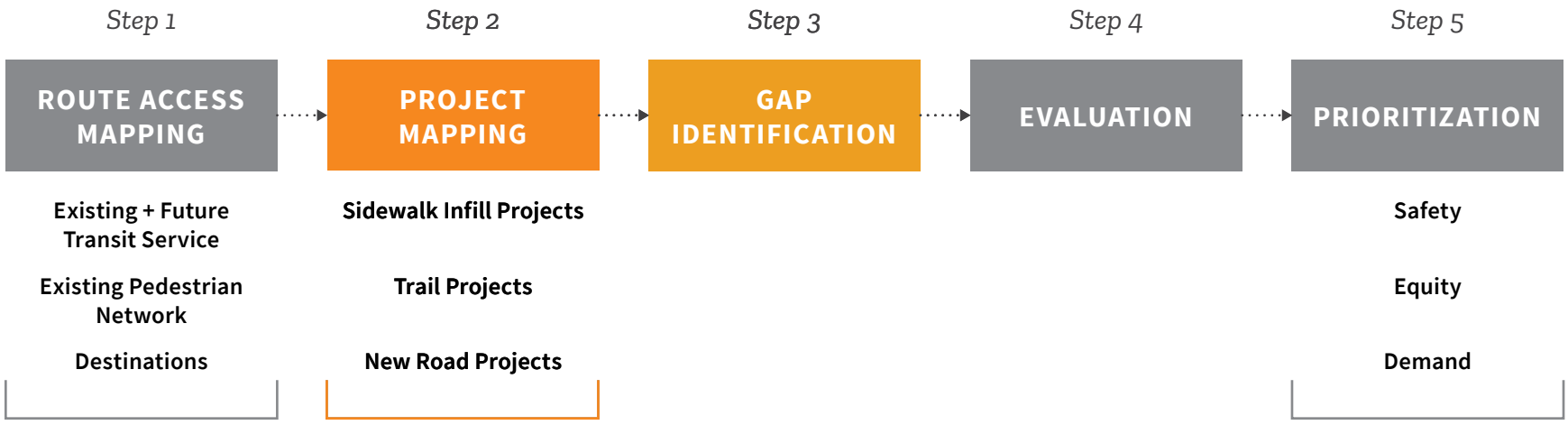
Mapping the Future Pedestrian Access to Transit Network

Step 2 of the Plan's analysis established a Future Pedestrian Network map layer in order to understand how proposed pedestrian improvements could improve access to existing and planned transit service.

The Future Pedestrian Network consists of pedestrian improvement projects identified by existing plans throughout the TriMet Service District including Transportation System Plans, Active Transportation Plans, Capital Improvement Plans, and trail planning documents. Nearly 2,000 projects submitted by jurisdictions and partners for inclusion in this planning process were evaluated and integrated into one map. These projects fall into three categories:

- Sidewalk construction, extension, or infill
- New roadway construction or extension that will include sidewalks
- Trail or pedestrian pathway construction or extension

Figure 9 The Plan's Five-Step Mapping Analysis



The result of this process is an integrated data set of previously identified projects throughout the TriMet Service District. The Future Pedestrian Network illustrates how potential pedestrian improvements relate to one another and to the transit network. This tool can help TriMet and jurisdictions understand how individual improvements might have an impact on connectivity throughout the region and target investments where they are most needed.

Source: TriMet

Gap Identification

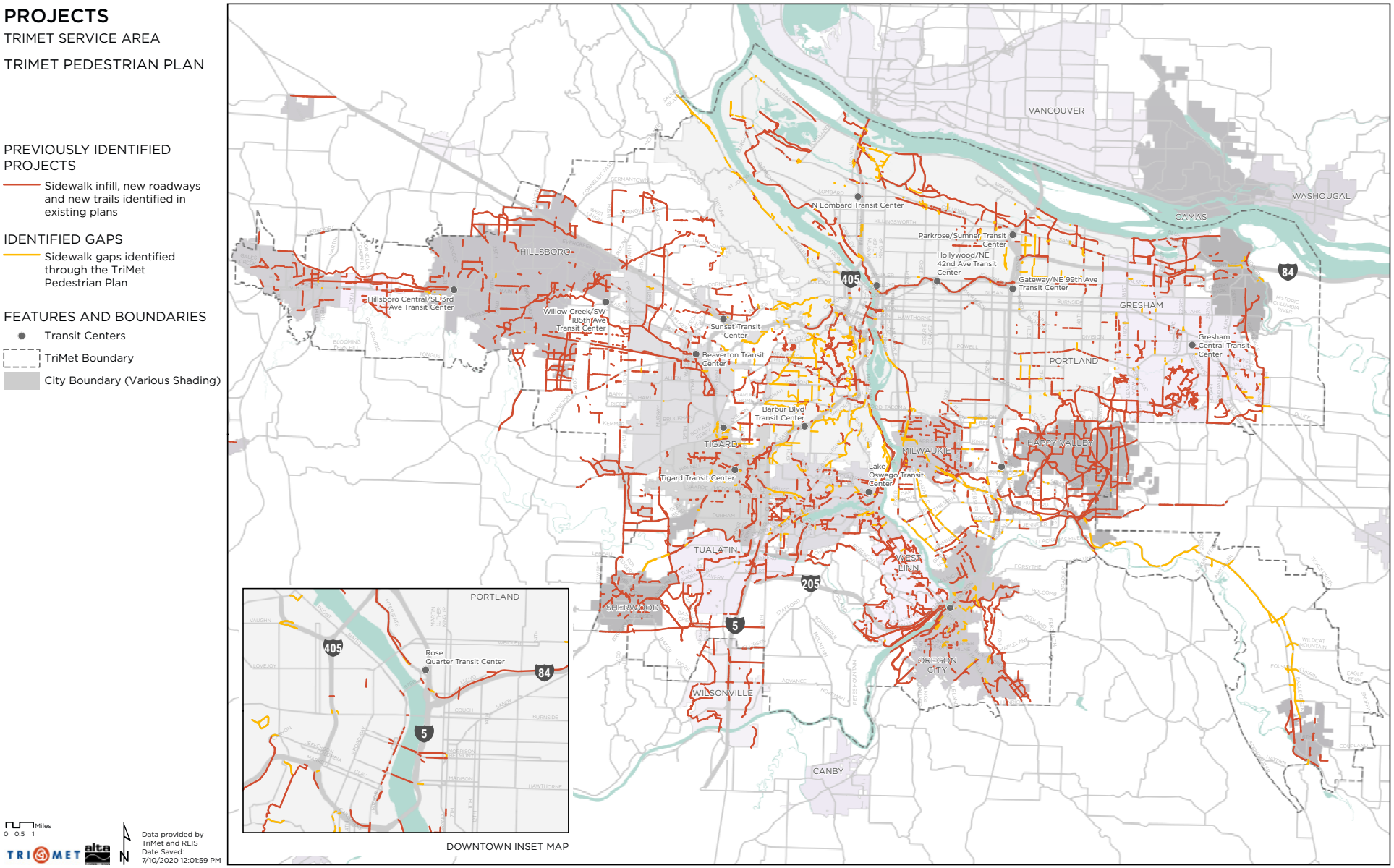
The project team analyzed the Future Pedestrian Network (i.e. pedestrian improvements from existing plans) with the region-wide sidewalk inventory (from OpenStreets Map). The Future Pedestrian Network would fill some gaps in walking and rolling access to transit, but not all. Through Step 3 of the mapping analysis, the project team identified those additional sidewalk gaps. The criteria for identifying these gaps were:

- Sidewalk absent on both sides of the street
- Minimum gap length of 100 feet
- Located within a transit walkshed (¼ mile of an existing transit stop)
- Located along a non-residential street

This process identified 758 gaps that met these criteria throughout the region. The average gap was 890 feet and the total length of the gaps was 124 miles. Map 5 illustrates the identified sidewalk gaps.

It is important to note that these gaps have not been evaluated for potential constraints, project need, or public support. Before moving forward with a project to address these gaps, further evaluation is necessary on a case-by-case basis.

Map 5 Pedestrian Projects based on the Future Pedestrian Network and Gap Identification



For the full 11.5” X 17” map, please refer to Appendix G

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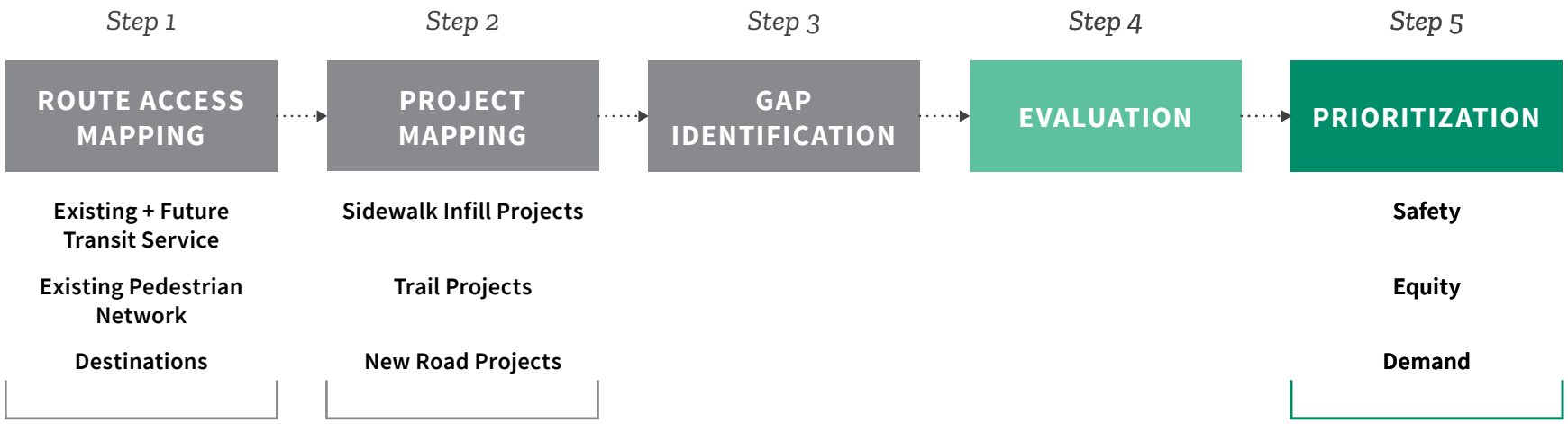
Ch. 4

Prioritizing Pedestrian Projects

Prioritizing Pedestrian Projects

The section describes the prioritization criteria that guide the Plan, how they were applied to projects, and displays the results of the prioritization process. For a detailed look at why the criteria were chosen and the methodologies for project evaluation and prioritization, refer to the TriMet Pedestrian Plan Analysis Memo in Appendix C.

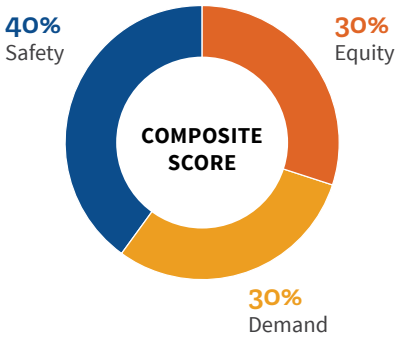
Figure 10 The Plan's Five-Step Mapping Analysis



Prioritization Criteria

Based on community, stakeholder, and agency input, TriMet established three overarching prioritization criteria—**safety, equity,** and **demand**—to evaluate potential pedestrian infrastructure projects. Each of these broad categories was measured using the specific components shown in Table 2.

Based on feedback from the online open house and the agency working groups that indicated that safety was the highest concern, the safety criterion was given a slightly heavier weighting. It is important to note that, nationally as well as locally, a disproportionate share of pedestrian-related crashes involve people of color or other vulnerable populations, and occur in communities with higher percentages of historically underserved populations. There is therefore some overlap between safety and equity as criteria. The final weighting of the three categories in the composite score is:



The composite prioritization results were normalized for each jurisdiction. This means that areas within a jurisdiction were given a prioritization score based on how they compare to the rest of the jurisdiction, rather than the region as a whole. Areas located in unincorporated areas were scored against the other unincorporated areas located within that county. Map 6 through Map 11 display the results of applying the composite prioritization score to every roadway and trail within the TriMet Service District regardless of whether a pedestrian project or gap is present. These maps show high-scoring areas for investment in pedestrian access to transit (based on the Plan's criteria) before proceeding to the final step of identifying the projects that fall within those high-scoring areas of the network. This allows for a dynamic process that can be updated in the future as pedestrian needs and projects change.

Table 2 Prioritization Criteria

PRIORITIZATION CRITERION	COMPONENT	METRIC OR DEFINITION	DATA SOURCE
Safety	Dangerous roads	Metro's High Injury Pedestrian Corridors	Metro
	Dangerous locations	Metro's Pedestrian High-Injury Intersections	Metro
	Sidewalks	Sidewalk completion within ¼ mile of each stop or station	OpenStreetMap
	Barrier streets	Higher speed/volume/width, defined in Metro Regional Active Transportation Plan	Metro
Equity	Low-income populations	Areas with income less than 150% of the federal poverty level	2018 ACS, Census Tracts
	Communities of color	Percent of people who either identify as Hispanic or do not identify as white	2018 ACS, Census Block Groups
	Seniors and people with disabilities	TriMet LIFT Paratransit origin and destination locations, and ramp deployments (percent of ramp deployment out of total ridership, by transit stop)	TriMet, RLIS
Demand	Population density	People per square mile	2018 ACS, Census Block Groups
	Employment density	Jobs per square mile	2016 LEHD, Census Blocks
	Current ridership	On/off by transit stop	TriMet
	Estimated ridership (for planned future transit lines)	Estimated on/off by transit stop for planned service additions	TriMet

Prioritized Tiers

Using the prioritization framework discussed above, a prioritization score was assigned to each project. The projects were then assigned to priority tiers from 1 (high) to 5 (low) using natural breaks in the data. Table 3 summarizes the projects by tier. Map 12 through Map 17 display the high priority projects. For a more detailed explanation of the prioritization process and a map of all of the prioritized projects, refer to Appendix C.

High-Priority Transit Stops

The prioritization scores were also applied to all existing TriMet stops. A list of stops located in the Tier 1 and Tier 2 areas was produced for each jurisdiction and is included as Appendix F. Jurisdictions can use this list to focus on transit stops that emerged as the most important when viewed through the pedestrian access-to-transit framework. Stops and stations located in Tier 1 and Tier 2 areas should be considered high priority locations for assessing crossing gaps at the jurisdictional level.

Table 3 Projects by Tier

TIER	COUNTY	PREVIOUSLY IDENTIFIED PROJECTS		NEW GAPS IDENTIFIED		ALL PROJECTS	
		NUMBER OF PROJECTS	LENGTH OF PROJECTS (MI)	NUMBER OF PROJECTS	LENGTH OF PROJECTS (MI)	NUMBER OF PROJECTS	LENGTH OF PROJECTS (MI)
1	**Total**	**103**	**21.4**	**28**	**4**	**131**	**25.3**
	Clackamas	29	8.2	8	2.5	37	10.8
	Multnomah	41	5.9	7	0.3	48	6.2
	Washington	33	7.2	13	1.1	46	8.3
2	**Total**	**286**	**68.7**	**117**	**15**	**403**	**83.7**
	Clackamas	107	26.9	54	7.3	161	34.2
	Multnomah	98	18.7	51	6.2	149	24.9
	Washington	81	23.1	12	1.5	93	24.6
3	**Total**	**379**	**95.6**	**204**	**30**	**583**	**125.6**
	Clackamas	136	33.2	66	11.4	202	44.6
	Multnomah	119	31.8	115	15.2	234	47
	Washington	124	30.6	23	3.5	147	34.1
4	**Total**	**420**	**113.9**	**252**	**48.7**	**672**	**162.6**
	Clackamas	141	27.7	87	19.3	228	47
	Multnomah	138	37.8	153	27.5	291	65.4
	Washington	141	48.3	12	1.9	153	50.2
5	**Total**	**289**	**124.4**	**157**	**27.1**	**446**	**151.5**
	Clackamas	69	33.2	27	5	96	38.2
	Multnomah	114	41	121	20.4	235	61.5
	Washington	106	50.1	9	1.7	115	51.9

Project Evaluation

The TriMet Pedestrian Plan not only established a prioritization score for each project, but also evaluated all of the projects based on a number of attributes to help understand how they would impact pedestrian access to transit, if implemented. The results of the evaluation are contained in the TriMet Pedestrian Plan Project List (Appendix E) and each project includes information on the following attributes:

Project Source: The agency that provided the project data.

Stops Served: The number of transit stops and stations within ¼ mile walk of the project.

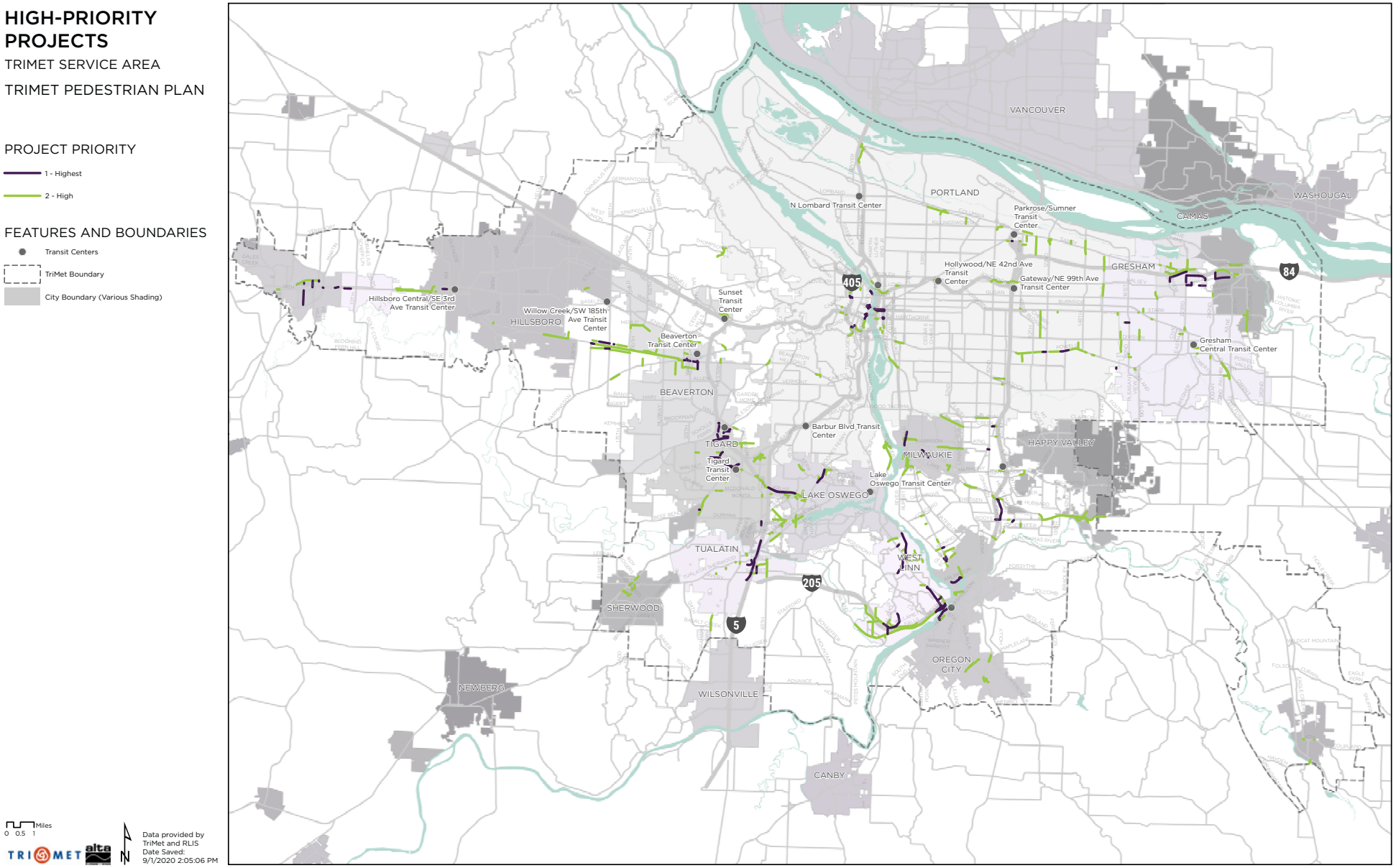
Regional Destinations: The number of regional destinations near the project. Destinations were counted if they were in a shared transit walkshed with the project.

Walkshed Expansion: Some of the projects would create new connections in the pedestrian network that were not previously available. This is true for new trail connections and new roadway projects. These connections expand the areas a pedestrian can access from a transit stop (walksheds). This attribute contains the average percent increase of the future walksheds from the existing walksheds that project is located within.

New Destinations Served: This attribute is derived from the results of the walkshed expansion. It records the number of new destinations within a project's walksheds due to the walkshed expansion.

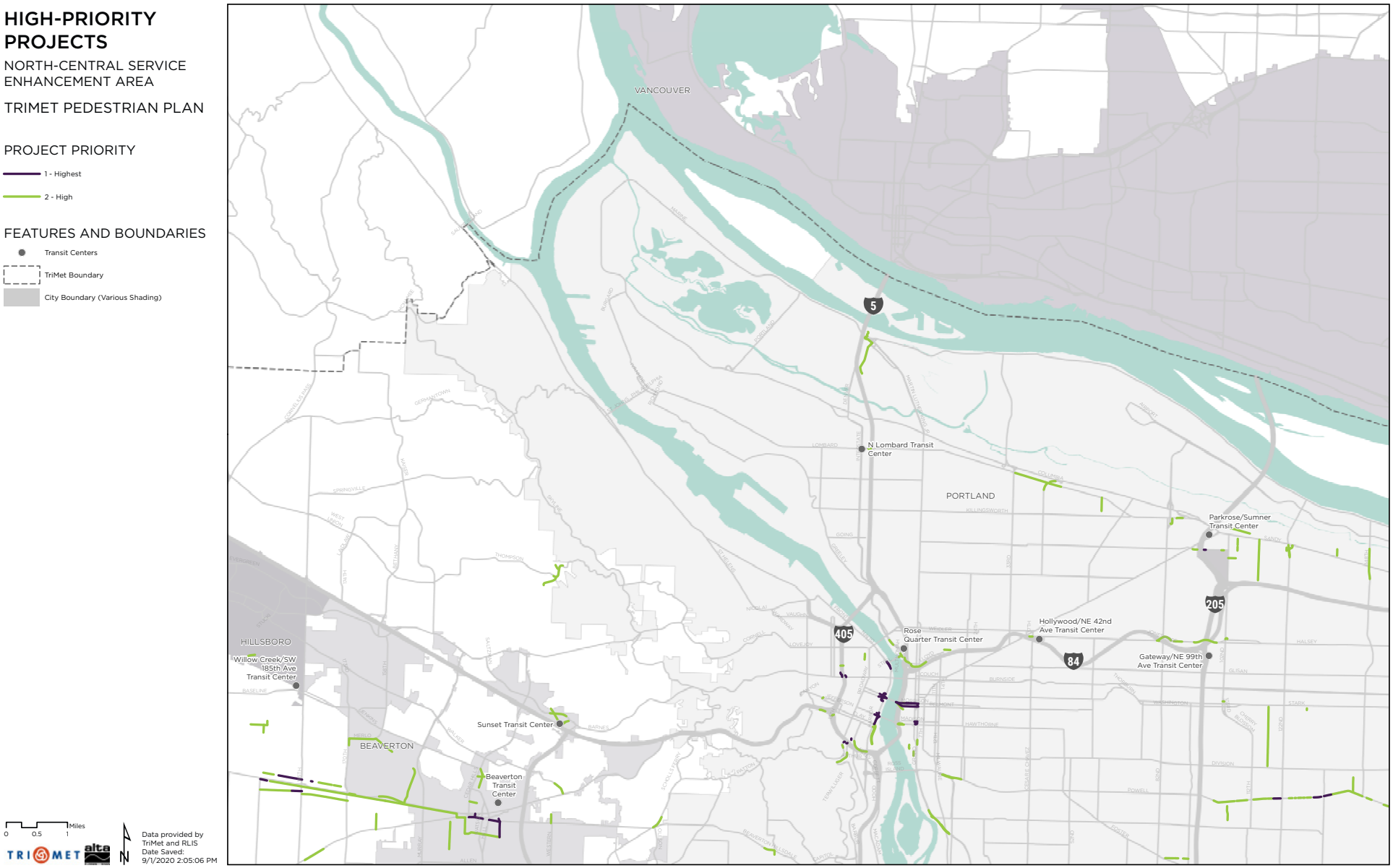
Crossing Description: This attribute denotes if the project description explicitly states that a crossing element is included.

Map 6 High-Scoring Areas of Network



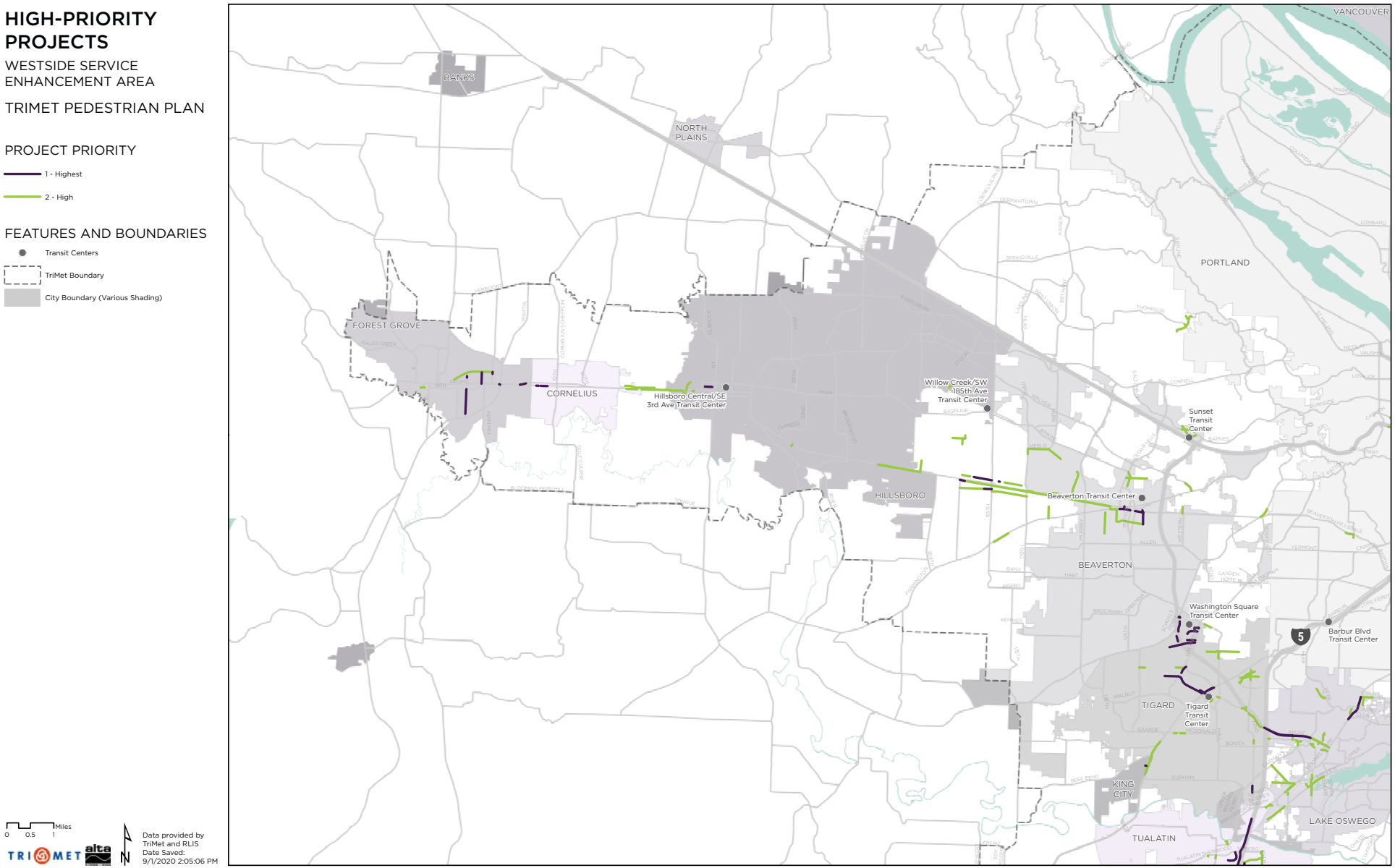
For the full 11.5” X 17” map, please refer to Appendix G

Map 7 High-Scoring Areas of Network, North + Central Service Enhancement Area



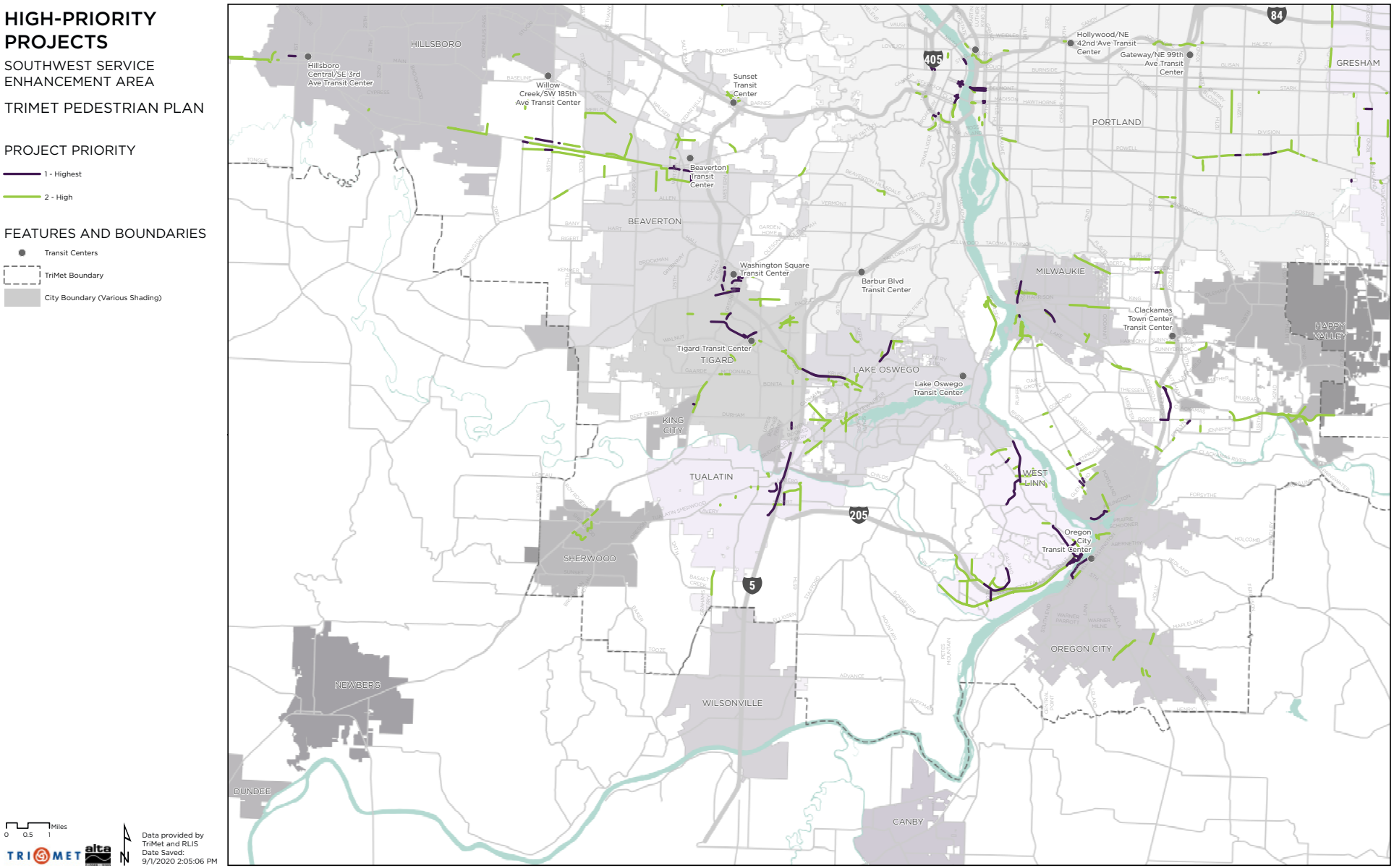
For the full 11.5” X 17” map, please refer to Appendix G

Map 8 High-Scoring Areas of Network, Westside Service Enhancement Area



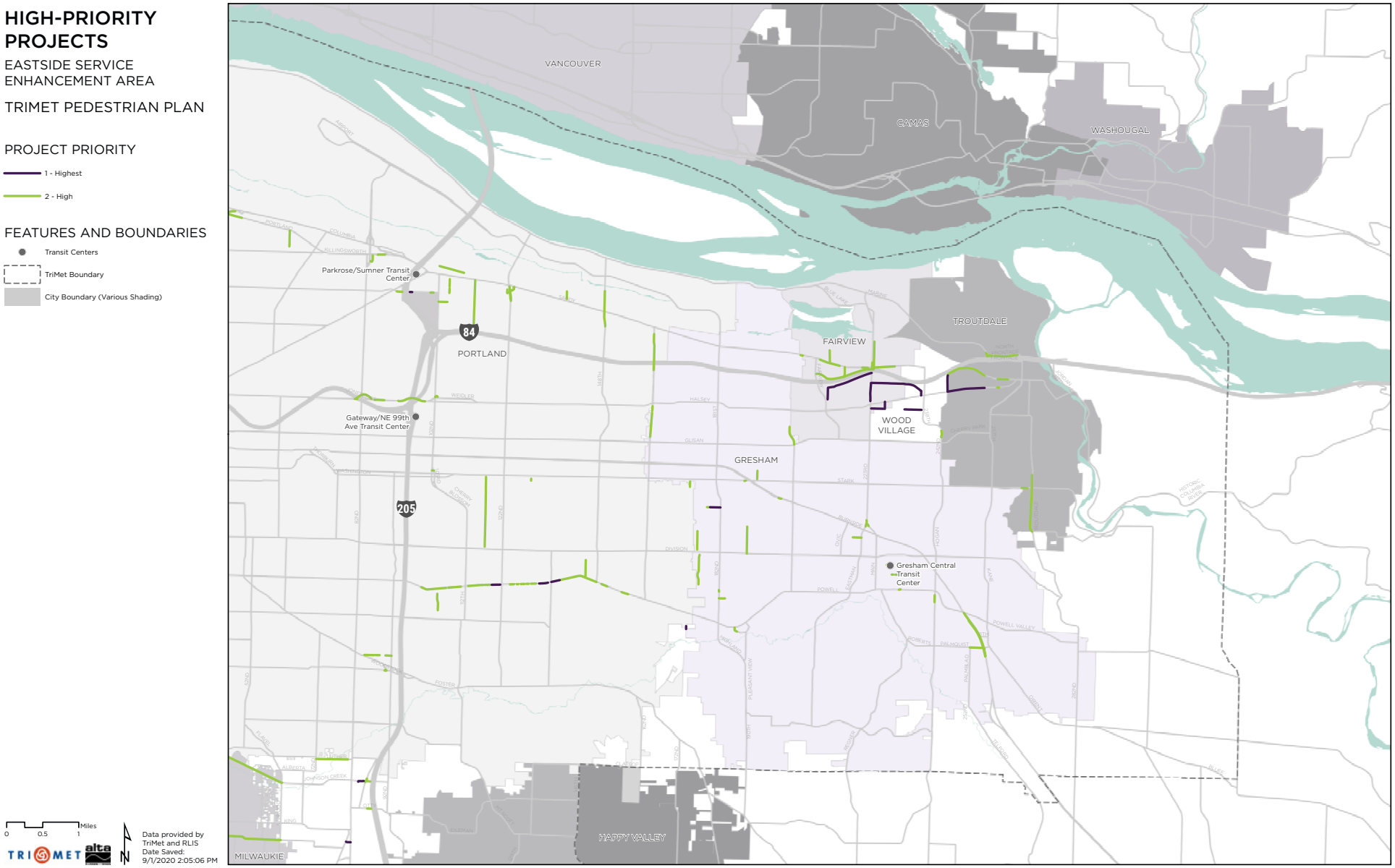
For the full 11.5” X 17” map, please refer to Appendix G

Map 9 High-Scoring Areas of Network, Southwest Service Enhancement Area



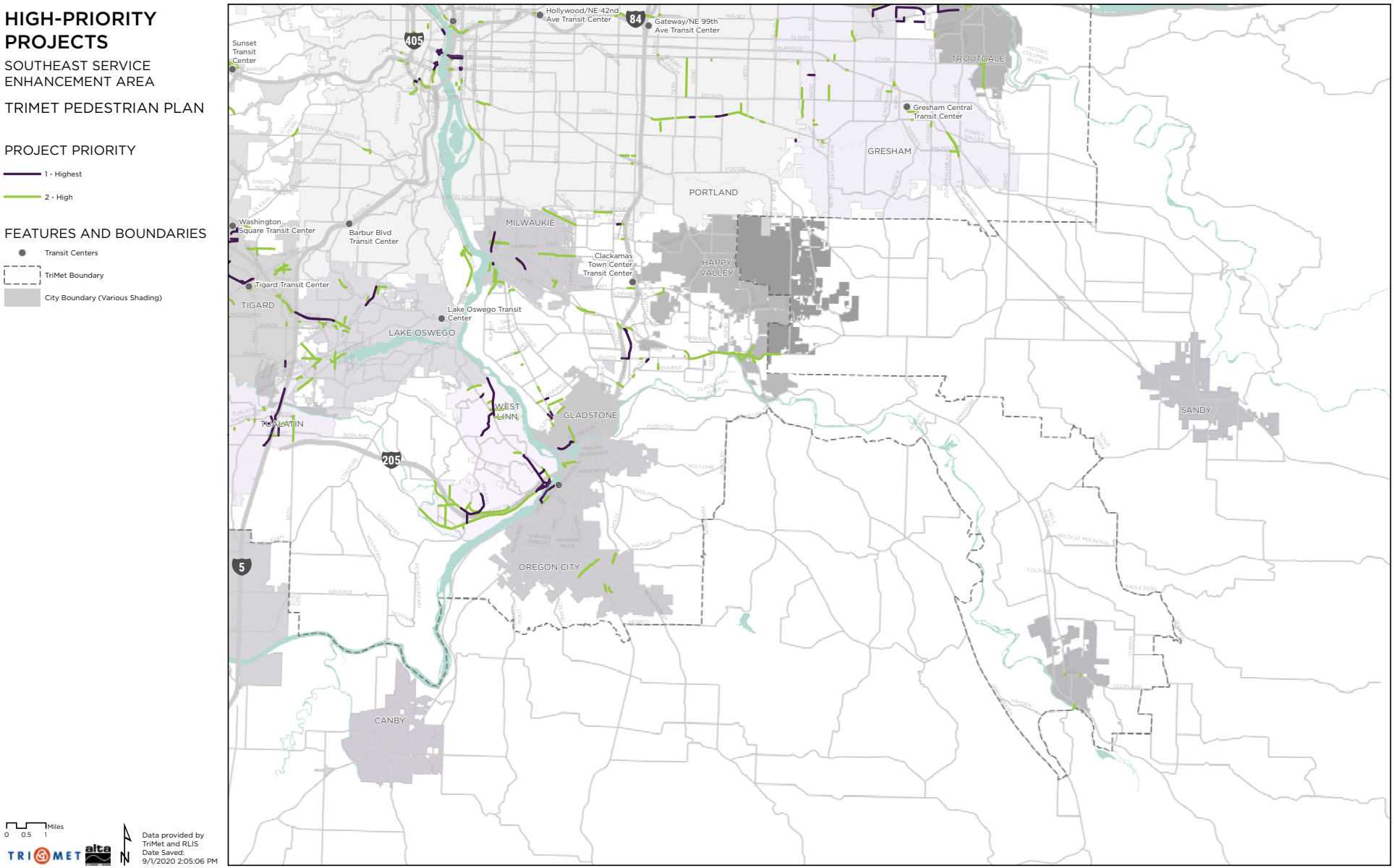
For the full 11.5” X 17” map, please refer to Appendix G

Map 10 High-Scoring Areas of Network, Eastside Service Enhancement Area



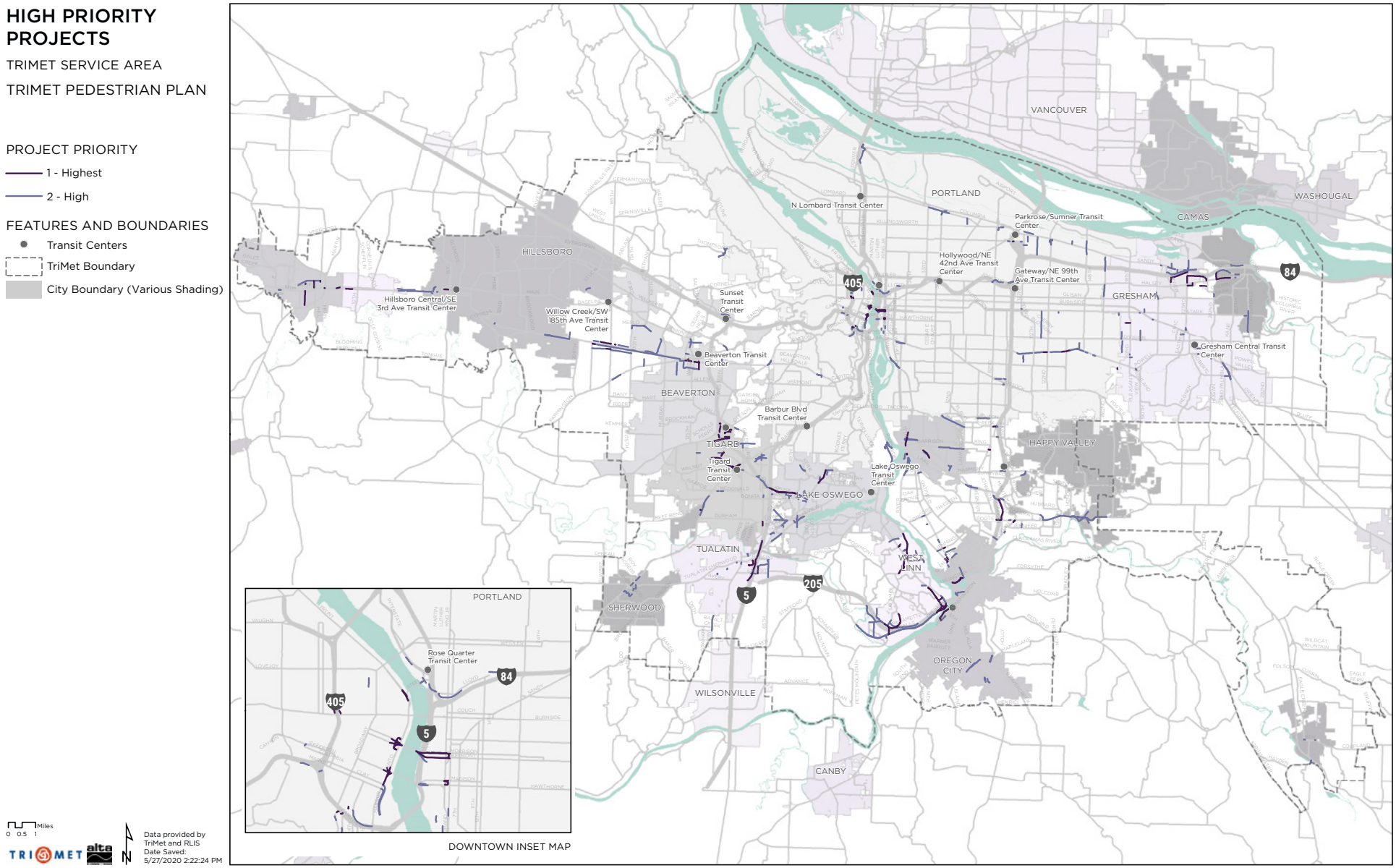
For the full 11.5” X 17” map, please refer to Appendix G

Map 11 High-Scoring Areas of Network, Southeast Service Enhancement Area



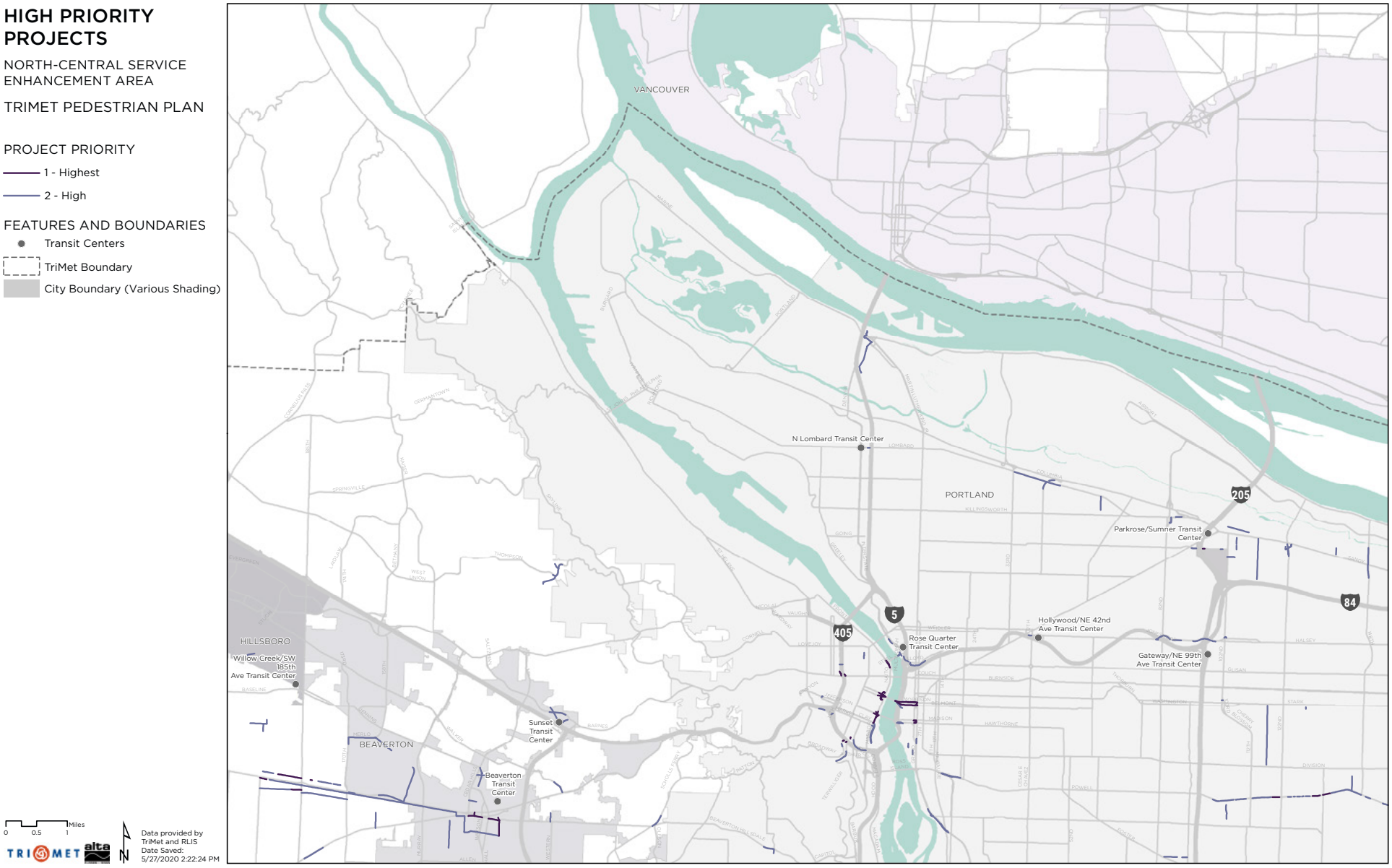
For the full 11.5” X 17” map, please refer to Appendix G

Map 12 High Priority Pedestrian Projects



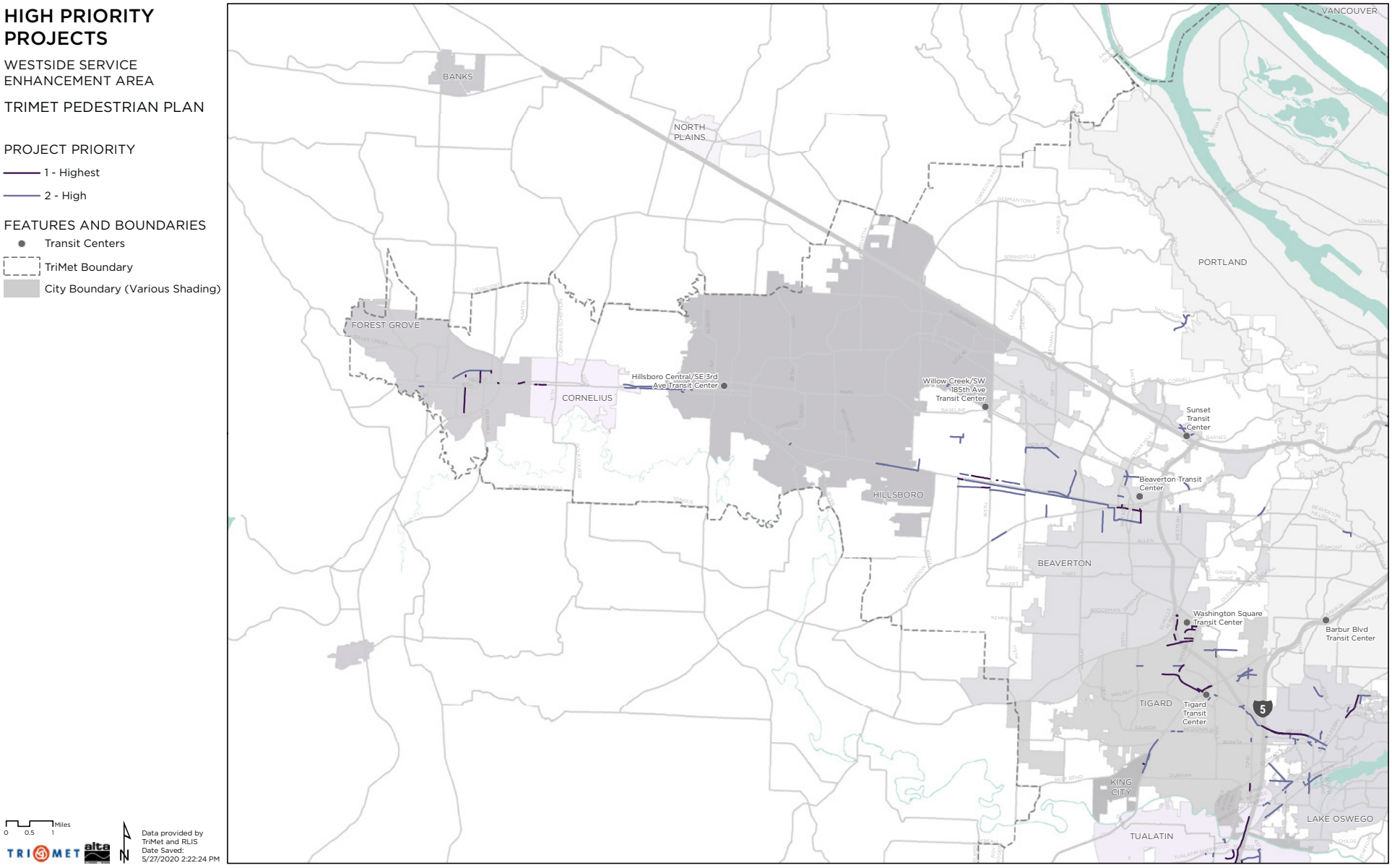
For the full 11.5” X 17” map, please refer to Appendix G

Map 13 High Priority Pedestrian Projects, North + Central Enhancement Area



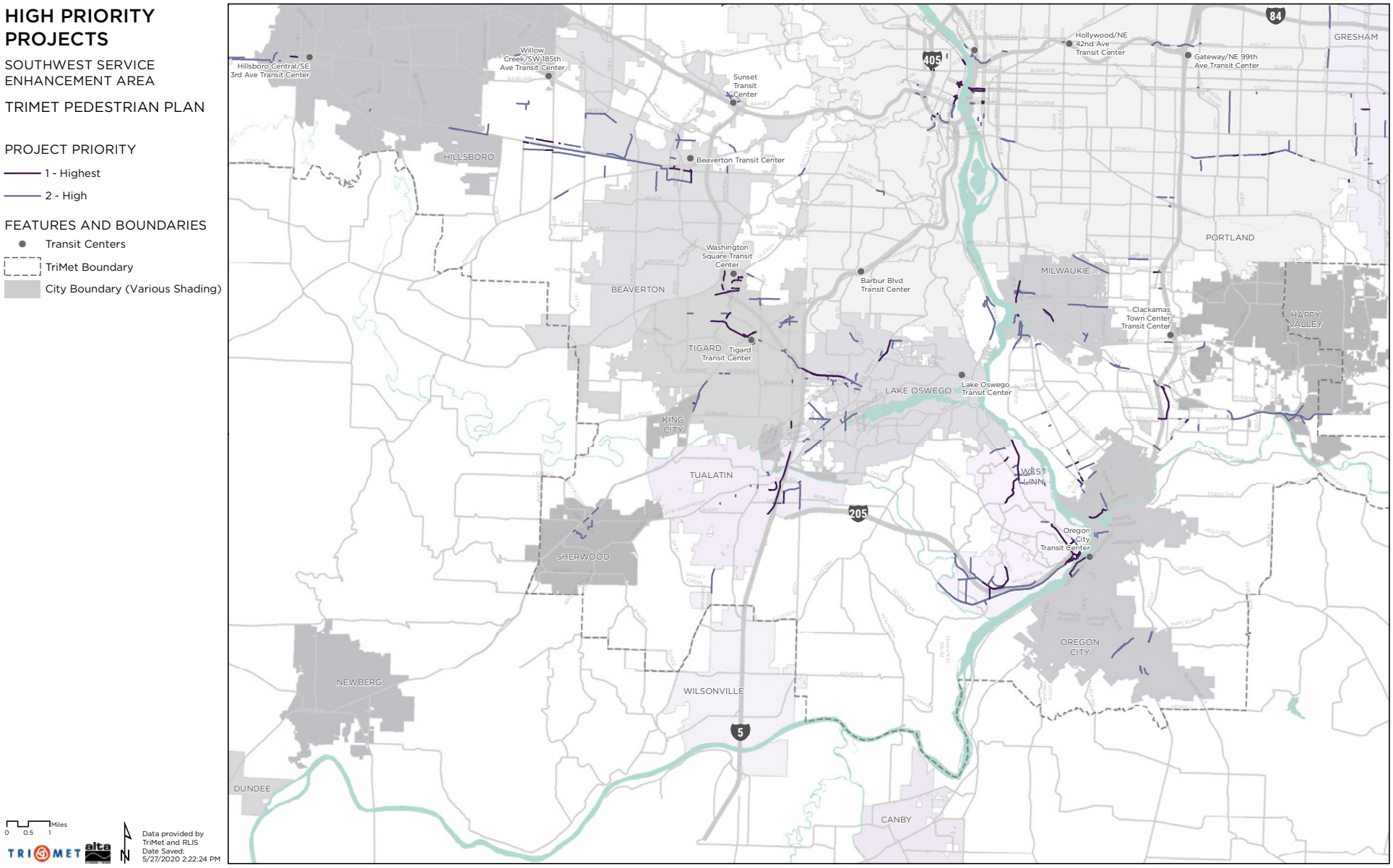
For the full 11.5” X 17” map, please refer to Appendix G

Map 14 High Priority Pedestrian Projects, Westside Service Enhancement Area



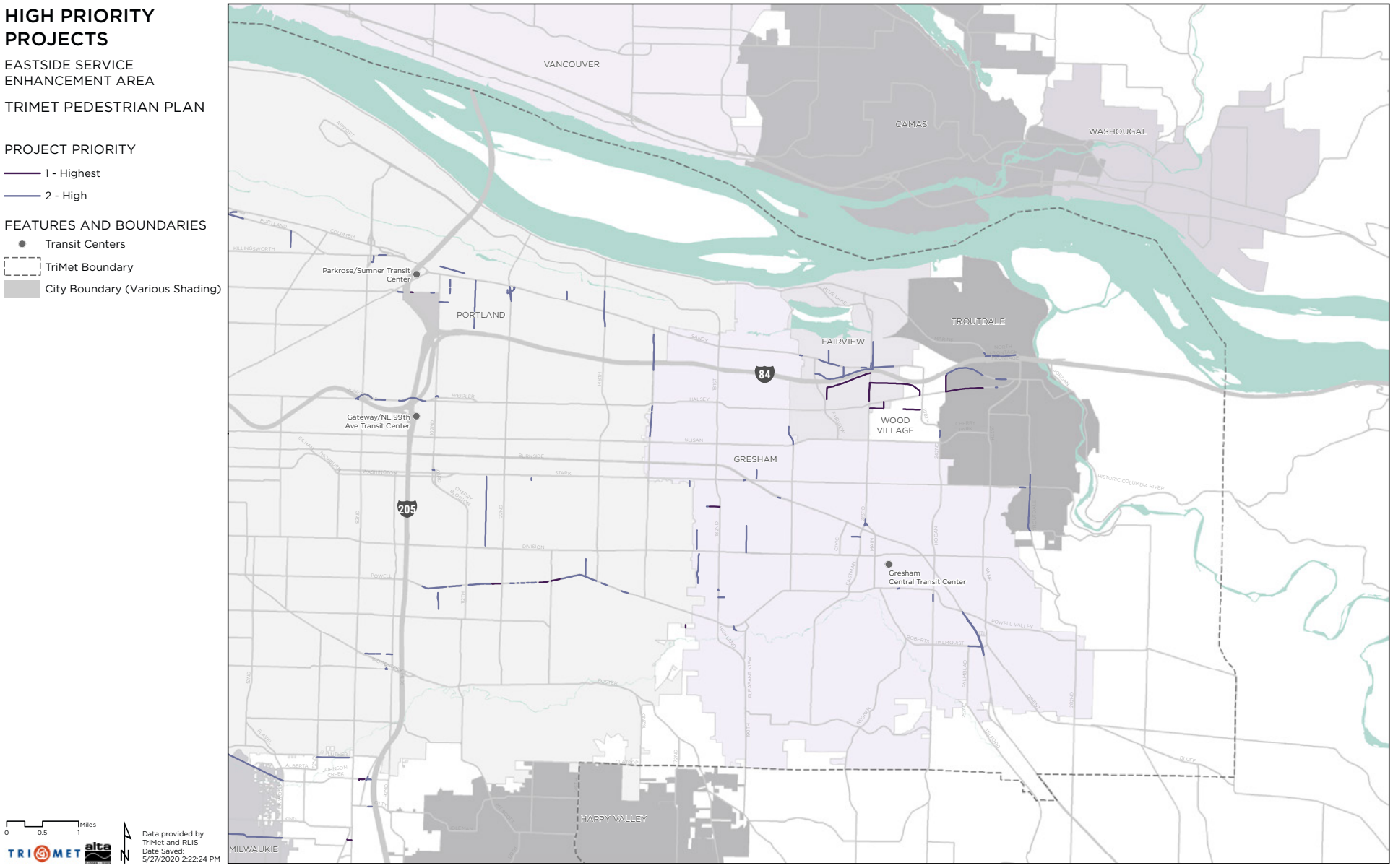
For the full 11.5” X 17” map, please refer to Appendix G

Map 15 High Priority Pedestrian Projects, Southwest Service Enhancement Area



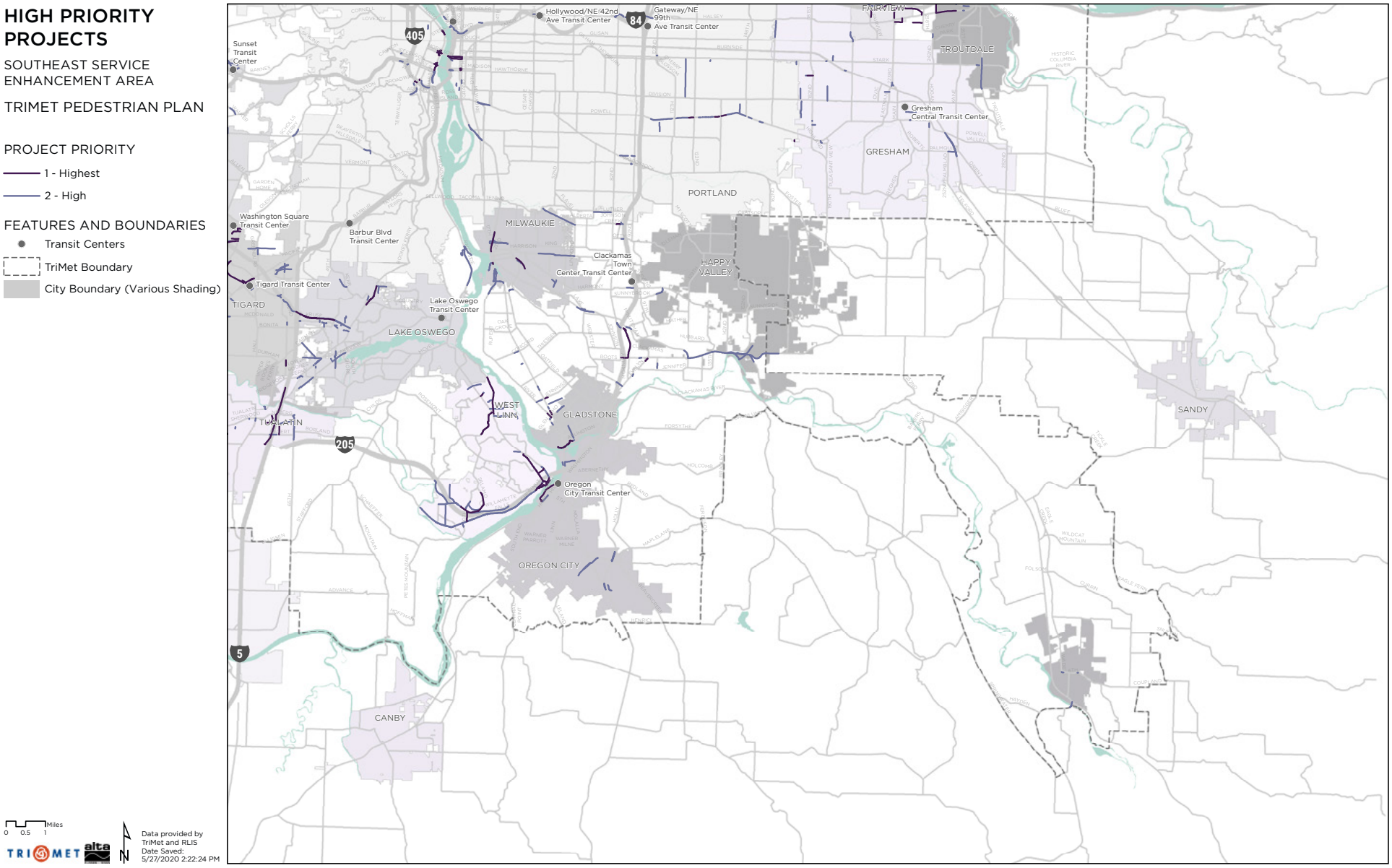
For the full 11.5” X 17” map, please refer to Appendix G

Map 16 High Priority Pedestrian Projects, Eastside Service Enhancement Area



For the full 11.5” X 17” map, please refer to Appendix G

Map 17 High Priority Pedestrian Projects, Southeast Service Enhancement Area



For the full 11.5” X 17” map, please refer to Appendix G

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Ch. 5

Moving Forward

Strategic Framework

The TriMet Pedestrian Plan maps linear gaps in pedestrian access to transit across TriMet's entire service area. Those sidewalk and trail gaps are then prioritized for implementation based on a transit-specific lens. This process offers a tool for measuring how completion of each gap in pedestrian access to transit would advance the guiding principles of Safety (reducing risk of traffic injury or death), Equity (improving access for those who need it most), and Demand (serving the most current and future transit users). This data-intensive analysis, described in Chapters 3 and 4, resulted in a robust list of pedestrian projects across the region.

But what does it take to actually realize safer and more comfortable walks to transit throughout TriMet's service area?

This chapter provides a suite of strategies to support implementation. It includes guidance for implementing the Plan's list of prioritized projects and other physical improvements, as well as programmatic and policy actions that support infrastructure investments. Input gained through community engagement, two agency partner working group sessions, and the Plan's Stakeholder Forum guided the formation of the strategies. The strategies align with the regional policy context for walking and rolling to transit and to the roles that TriMet and local partners can play. The goal of this chapter is to provide unified guidance that better enables TriMet and agency partners to work together to improve the safety and comfort of people walking and rolling to access transit.

Policy Nexus

As TriMet and agency partners work collaboratively and independently to advance pedestrian access to transit, they are also adhering to common policy goals and transportation planning objectives. At the state level, ODOT's Oregon Public Transportation Plan establishes multiple goals that have a direct policy nexus with the recommendations of TriMet's Pedestrian Plan:

- **Goal 1** addresses the importance of enabling transit users of all abilities to access transit safely;
- **Goal 2** calls upon removing barriers to accessing transit in a variety of built environments, and improving connections between modes;
- **Goal 4** speaks to addressing the needs of and better engaging with transportation-disadvantaged populations who rely on transit;
- **Goal 6** recognizes the need to provide a sense of safety and security for transit riders on the entirety of their trip, including those accessing it by foot or using a mobility device for the first and last mile; and
- **Goals 9** and **10** highlight the need for funding, partnerships, and regional collaboration to serve the needs of transit riders, including first and last mile access to transit

Metro's Regional Transportation Functional Plan (RTFP) codifies the ways in which counties and local jurisdictions plan for all modes of transportation, including transit, walking and rolling. The RTFP requires that each jurisdiction's Transportation System Plan (TSP) include a transit plan and a pedestrian plan, with a map that shows "pedestrian routes…between essential destinations and transit stops" and "an evaluation of needs for pedestrian access to transit and essential destinations for all mobility levels, including direct, comfortable and safe pedestrian routes" among other requirements (discussed further in Chapter 1 and the Appendix). The TriMet Pedestrian Plan serves as a resource and foundational planning document for the jurisdictions within the service area that are required to have a TSP.

Metro's Regional Active Transportation Plan (RATP) provides guidance to complement the obligations of the RTFP. TriMet's Pedestrian Plan advances many of the RATP's recommended policies and implementing actions, including making the completion of walking and bicycling networks and access to transit a top transportation priority. Moving forward with TriMet Pedestrian Plan priority projects will also contribute to the RATP's targets for measuring progress in active transportation, including:

Source: TriMet

Active Transportation Target: By 2040, triple the walking, biking and transit mode shares for all trips compared to 2015 modeled mode shares within the urban growth boundary compared to 2015 modeled mode shares.

Safety Target: By 2035, elimiate transportation related fatalities and serious injuries for all users of the region's transportation system, with a 50 percent reduction by 2025 and a 16 percent reduction by 2020 (as compared to the 2015 five-year rolling average.

System Completeness (Access to Travel Options) Target: By 2040, complete 100 percent of the regional network of sidewalks, bikeways and trails.

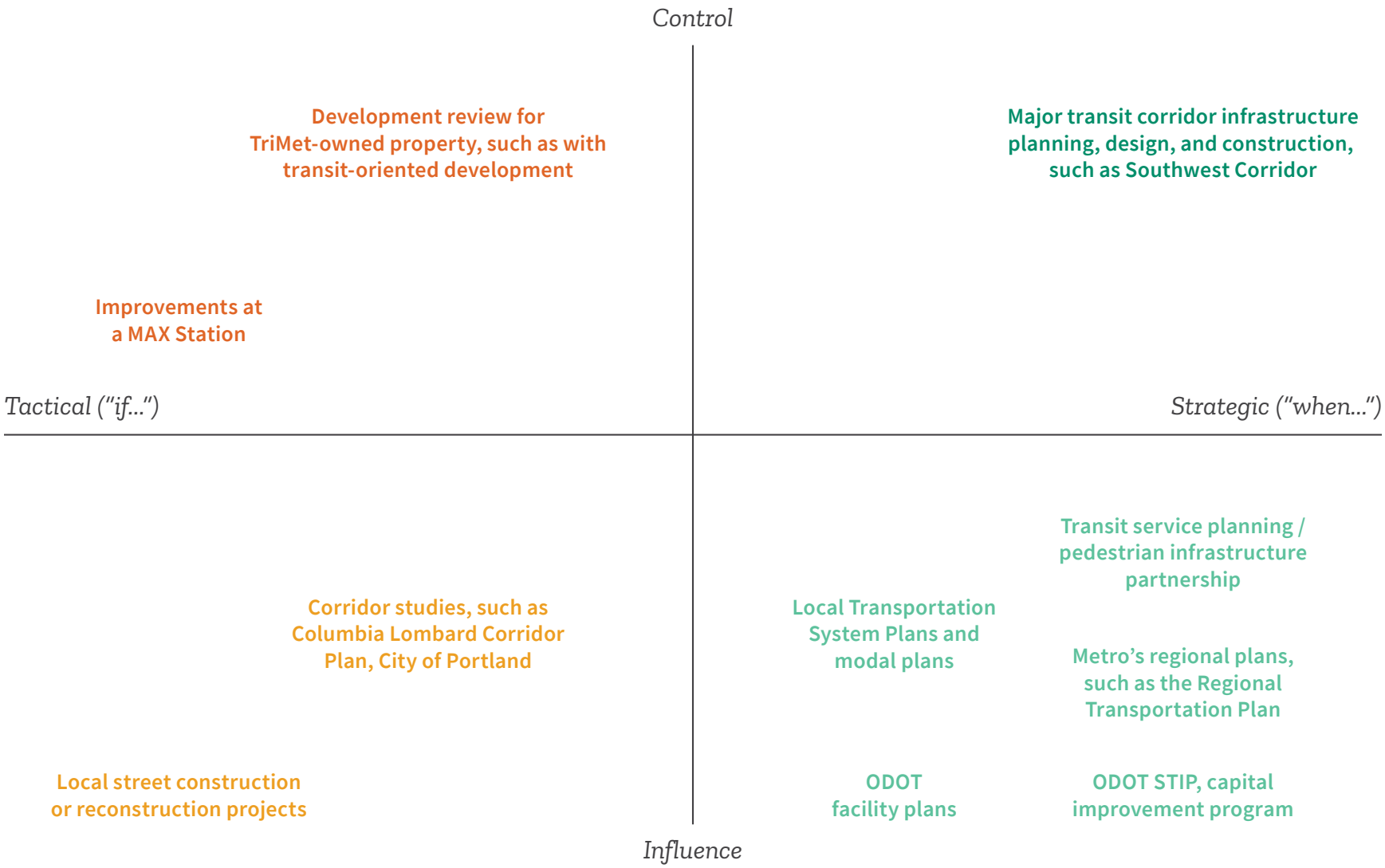
Access to Jobs, Community Places, and Transit: There is no target for these measures. The desired direction is to increased the number of low and middle-wage jobs and community places accessible to the average household in equity focus areas compared to the average household in non-equity focus areas, as well as to increase the number and share of households and employment near high capacity or frequent transit service by 2040.

Roles in Implementation

As the Portland region's primary transit service provider, TriMet's influence over the physical environment generally begins and ends at a transit stop or station. How a transit rider accesses that stop or station, regardless of their mode, is largely the domain of the roadway authority - a city, county, or the Oregon Department of Transportation. While TriMet does not have control over the street networks, public right-of-way, or adjacent land uses that a pedestrian will encounter, the agency has many ways of collaborating with partners to advance common goals.

Figure 11 below illustrates the varying levels of influence that TriMet has in effecting pedestrian access to transit. The vertical axis reflects TriMet's level of influence over project outcomes, from advisory at the bottom to lead decision-making at the top. The horizontal axis refers to the spectrum of project implications from tactical to strategic. Tactical projects are largely localized and improvements to pedestrian access to transit are considered opportunistically, as the opportunity arises. This could include incorporating pedestrian improvements into a larger multimodal roadway project that is being implemented or in conjunction with a new development. Strategic projects are more systemic in nature and allow pedestrian access to transit to be addressed as part of an established local or regional process. Where TriMet has less influence, partner agencies have more. This speaks to the importance of articulating roles in implementation, as well as the necessity of partners collaborating to achieve common goals across all project types. The diagram below provides a framework for identifying appropriate agency roles in the strategies and actions of this Plan.

Figure 11 Illustrating the variations in TriMet agency involvement in projects that influence pedestrian access to transit



Recommended Strategies

Moving forward, TriMet and agency partners, including counties and local jurisdictions, should focus on the following four strategies to expand work already underway, increase resources, and improve outcomes:

- Plan for greater investment in the needs of people walking and rolling to transit
- Make more walking and rolling trips to transit possible
- Make walking and rolling trips to transit safer and more comfortable
- Better coordinate and communicate on pedestrian improvements

These recommendations are described below, with a series of actions that advance each strategy. For all 15 actions, the regional and state policies that most closely tied to the action are noted, along with anticipated agency roles in implementing the action.

Source: TriMet

STRATEGY		ACTION		AGENCY ROLES			
				COUNTIES + MUNICIPALITIES	METRO	TRIMET	ODOT
1	Plan for greater investment in the needs of people walking and rolling to transit	A	Incorporate the TriMet Pedestrian Plan priorities into Transportation System Plans and modal plans	●	●		
		B	Align infrastructure funding with priorities for pedestrian access to transit	●	●		●
		C	Collaborate for regional investments in pedestrian access to transit	●	●	●	●
		D	Track and evaluate improvements to pedestrian access to transit	●	●	●	●
2	Make more walking and rolling trips to transit possible	A	Close sidewalk and trail gaps within transit walksheds	●	●	●	●
		B	Prioritize adding marked and enhanced crossings within transit walksheds	●		●	●
		C	Develop local guidance to implement policies regarding the co-location of crossings with transit stops and stations	●		●	
		D	Create universally accessible routes to transit	●			●
3	Make walking and rolling trips to transit safer and more comfortable	A	Apply current best practices in pedestrian design, designing for safety of all ages and abilities	●	●		●
		B	Include pedestrian-scale lighting within transit walksheds	●	●		●
		C	Design for personal safety and security for people walking and rolling to transit	●	●		●
		D	Improve the legibility of navigating on foot or by mobility device to and from transit stops	●	●		●
4	Better coordinate and communicate on pedestrian improvements	A	Share technical resources for implementing this Plan	●	●	●	
		B	Engage each other as stakeholders in project delivery	●	●	●	●
		C	Generate community awareness of the Plan	●	●	●	●

Strategy 1

Plan for Greater Investment in the Needs of People Walking and Rolling to Transit

The ability to walk to transit is a fundamental feature of a well-functioning regional and local transportation system. The needs of people walking and rolling to transit will only be met through intentional planning, and through funding that moves those plans forward.

POLICY NEXUS

- Metro's Regional Transportation Functional Plan Transportation System Plan Policies 03.08.120 and 03.08.130
- Metro Regional Active Transportation Plan Targets for Active Transportation, Basic Infrastructure, Safety, and Access to Daily Needs
- Oregon Public Transportation Plan Goal 9: Funding and Strategic Investment and Goal 10: Communication, Collaboration, and Coordination

ACTIONS

A. Incorporate the TriMet Pedestrian Plan priorities into Transportation System Plans and modal plans

B. Align infrastructure funding with priorities for pedestrian access to transit

C. Collaborate for regional investments in pedestrian access to transit

D. Track and evaluate improvements to pedestrian access to transit

RESOURCES

- Federal Transit Administration Manual on Pedestrian and Bicycle Connections to Transit
- Metro Regional Transportation Plan

"Adopting clear plans and policies to support active transportation connections to transit is a driver of organizational culture change and gives employees working on these topics the authority to advance them."

Federal Transit Administration Manual on Pedestrian and Bicycle Connections to Transit (August 2017), p 5

Strategy 1, Action A

Incorporate the TriMet Pedestrian Plan priorities into Transportation System Plans and modal plans

LED BY

Counties and municipalities; Metro

DESCRIPTION

The TriMet Pedestrian Plan provides a list of projects that close gaps in pedestrian access to transit. Each project's priority score is relative to other projects within that municipality; projects outside municipal boundaries are scored relative to other projects within the unincorporated County. Counties and local municipalities should incorporate the project list into their Transportation System Plan (TSP) during the next update and use the results of this Plan's analyses to provide data-driven basis for the project's value. The quantitative measures of value include:

- the project's contribution to Safety, Equity, and Demand related to accessing transit (the prioritization score),
- route directness to destinations from transit stops and stations, and
- expansions of transit walksheds (as a result of new connections).

For Pedestrian Modal Plans, this effort does not offer a comprehensive set of pedestrian needs or recommended projects, but offers an important dataset of access-to-transit projects to incorporate into a larger pedestrian network analysis. Similarly, local Transit Modal Plans can draw upon the recommendations of this Plan when considering access needs and priorities.

Strategy 1, Action B

Align infrastructure funding with priorities for pedestrian access to transit

LED BY

Counties and municipalities; ODOT; Metro

DESCRIPTION

Aligning available funding with TriMet Pedestrian Plan priority projects (Tier 1 and Tier 2 projects) enables agencies to be proactive and strategic when investing in walking access to transit. Transportation System Plans (TSPs) and Capital Improvement Plans (CIPs) are good places to do this. TSPs (Strategy 1/Action A) are required to include a funding program that uses existing and anticipated revenue sources and project cost estimates to determine what projects can be implemented within fiscal constraints. The TSP project list provides a basis for local capital improvement plans or programs. Across the jurisdictions and partner agencies in TriMet's service area, a variety of other types of funding programs exist. This could be Safe Routes to School, a voter-approved transportation bond (e.g., Tualatin's Moving Forward), or a program for small-scale project implementation (e.g., Portland's Pedestrian Network Completion Program). Counties and municipalities should identify existing funding programs that overlap with the goals of improved pedestrian access to transit.

> *"TriMet typically does not directly provide pedestrian improvements. They do, however, frequently work with the City of Portland to apply for and use grant and other funding for pedestrian access to transit projects."*

PedPDX, pg. 318

The projects identified in this Plan should also be incorporated into Metro's Regional Transportation Plan (RTP), which is absorbed into ODOT's Statewide Transportation Improvement Program (STIP). These documents provide the critical path between project identification and project investment.

As part of project implementation, partners may need to evaluate partial property acquisitions or ROW dedications, and strategies for associated funding. To the extent possible, the design of improvements should be sensitive to impacts on adjacent property, and must include all relevant stakeholders in the development of recommendations.

Strategy 1, Action C

Collaborate for regional investments in pedestrian access to transit

LED BY

TriMet and Metro, with active involvement from counties, municipalities, and ODOT

DESCRIPTION

Metro has established regional goals and performance targets that will benefit from a multijurisdictional effort to improve pedestrian access to transit. Through this Plan's analysis, TriMet has identified transit-specific priorities for pedestrians across multiple jurisdictions. To gain system-wide benefits, TriMet needs all municipalities and counties to make progress in implementation.

Collaboration on regional pedestrian investments need not be ongoing or exhaustive but can occur on an ad-hoc basis. Metro and TriMet could act as co-conveners and initiate focused periods of collaboration to pursue external grants or contribute to planning and capital improvement program development. Contributions to grant-writing and planning efforts can include data sharing, data analysis, and additional funding or resources.

> *"Collaboration is key. If the goal is to improve safety and maximize the use of walking and bicycling to transit, no single agency or organization can accomplish this on its own."*

Federal Transit Administration Manual on Pedestrian and Bicycle Connections to Transit (August 2017), p 5

TriMet's 2011 Pedestrian Network Analysis provides a case study. While implementation at the local level varied significantly across the region, collaboration after the study guided regional investments in pedestrian networks and access to transit, including leveraging grant money and partnerships with local, regional, and state jurisdictions. The analysis served as a basis to apply for and secure grant funding for capital infrastructure improvements including new sidewalks, enhanced crossings, rapid flash beacons, medians, signalized intersections, and bus stop improvements. For example, three corridor projects were awarded in the ODOT STIP 2015-2018 Enhance Funds cycle for these improvements, totaling just over $8 million in new capital project infrastructure for OR-8/TV Highway; Barbur/OR-99W, and Powell-Division corridors.

Strategy 1, Action D

Track and evaluate improvements to pedestrian access to transit

LED BY

TriMet, with active involvement from Metro, counties and municipalities

DESCRIPTION

TriMet should facilitate the gathering of updates to the GIS database of proposed and completed projects that occur within existing and future transit walksheds. Counties and municipalities will need to be active participants, providing project and network data when requested by TriMet. Metro already serves as a collector and manager of multiple regional datasets (such as for the RTP and RATP maps). Data gathered to track progress specific to this Plan can be shared with Metro for consistency in regional planning, and for inclusion in evaluations of regional targets and transportation performance measures.

Given the changing nature of project data across such a large area, this update should occur at established regular intervals consistent with staff's ability to manage data requests and updates (such as every 2-3 years). This interval could be aligned with existing schedules for regional planning, such as Metro's Regional Flexible Funds Allocation (RFFA) that is developed every three years or Metro's Regional Transportation Plan Update every five years.

Beyond tracking implementation progress, evaluation of that activity can occur on the same schedule as data updates. Evaluation may take the form of any of the following approaches, depending on what measurements are needed to align with regional performance targets and TriMet agency goals:

- quantifying progress (e.g. miles of sidewalk built, dollars invested, and similar),
- a new analysis of outcomes (e.g. estimated number of new users, estimated economic benefit, and similar), or
- tallying up the estimated benefits already calculated in the TriMet Pedestrian Plan prioritization analysis (e.g. % increase in transit walkshed).

In its periodic surveys of transit riders, TriMet often asks about the mode by which riders access transit. TriMet should continue to regularly ask riders both about how they access transit and what barriers they encounter in their walk or roll to transit. These data can be used to analyze whether there is a relationship between the location of pedestrian improvements and changes in modes used to access transit in those locations.

Strategy 2

Make More Walking and Rolling Trips to Transit Possible

A single gap in the pedestrian network can prevent a person from walking to transit. This is also true for barriers that create de facto gaps, such as wide roads, high speeds, and heavy traffic. A 2015 study[9] found that the factors most affecting people's choice to walk and take transit were the amount of time it takes to walk to transit, perceptions of crime safety, and sidewalk availability. Completing and connecting the pedestrian network is fundamental to making walking trips to transit possible.

POLICY NEXUS

- Regional Transportation Functional Plan
- Oregon Public Transportation Plan Goal 1: Mobility, Goal 2: Accessibility and Connectivity and Goal 4: Equity

ACTIONS

A. Close sidewalk and trail gaps within transit walksheds

B. Prioritize adding marked and enhanced crossings within transit walksheds

C. Develop local guidance to implement policies regarding the co-location of crossings with transit stops and stations

D. Create universally accessible routes to transit

RESOURCES

- NACTO Urban Street Design Guide
- NACTO Transit Street Design Guide
- U.S Access Board Public Right of Way Accessibility Guidelines (PROWAG)
- ODOT's Blueprint for Urban Design
- ODOT Highway Design Manual Appendix L Bicycle and Pedestrian Design Guide
- Metro's Designing Livable Streets and Trails Guide
- TriMet's Bus Stop Guidelines
- TriMet's Design Criteria (esp. Chapter 23, Bus Stops)

Strategy 2, Action A

Close sidewalk and trail gaps within transit walksheds

LED BY

Counties and municipalities; ODOT; TriMet; Metro

DESCRIPTION

Owners of the roadway network, as the chief implementers of new pedestrian infrastructure, have the greatest role in completing network connections. Counties, local municipalities, and ODOT should close sidewalk and trail gaps that currently impede walking trips to transit. Closing a gap provides an immediate return on investment by leveraging the existing pedestrian network. In this Plan, the value of closing a gap is measured by the increase in the distance a person can walk to or from a transit stop or station once the barrier of an incomplete network is removed. This includes any expansion of the transit walkshed (how far a person can go) and any additional destinations that become reachable within the transit walkshed following project completion. For example, adding a new sidewalk connection may allow a person to walk a continuous path (without any gaps) to five more restaurants and office buildings that were previously inaccessible from a transit stop because there was no safe way to get there.

Investing in new sidewalks and trails is primarily accomplished through Capital Improvement Programs, including ODOT's Statewide Transportation Improvement Program (STIP) and Metro's Metropolitan Transportation Improvement Program (MTIP), which is included in the STIP. TriMet should ensure that the capital projects it leads (e.g. new construction of transit facilities or development of TriMet property) prioritize sidewalk and trail connections to the site.

Strategy 2, Action B

Prioritize adding marked and enhanced crossings within transit walksheds

LED BY

Counties and local municipalities; ODOT; TriMet

DESCRIPTION

In Oregon, every intersection is a legal "crosswalk" (ORS 801.220), unless prohibited with "crosswalk closed" signage. A person walking is legally permitted to cross any street at any intersection whether the crossing is marked or not; motorists are required to yield. Providing marked and enhanced crossings that are appropriate for the roadway characteristics can improve safety by increasing the visibility of pedestrians and of motorist compliance, and indicating to pedestrians a preferred place to cross. Crossings that reduce a pedestrian's exposure to motor vehicle movements and where people feel comfortable crossing are fundamental to making walking to transit a viable choice.

To build safe and comfortable crossings, counties, municipalities, and ODOT should design and implement new crossing facilities as part of the project scope of each linear sidewalk and trail project prioritized in this Plan. TriMet should ensure that the capital projects they lead (e.g. new construction of transit facilities or development of TriMet property) prioritize crossing improvements to the site.

> *"As traffic speeds and volumes increase, so too does the level of protection desired by pedestrians. Where vehicle speeds and volumes are high and pedestrian access is expected at regular intervals, signalized crossings preserve a safe walking environment. Where anticipated pedestrian traffic is low or intermittent, or where vehicle volumes are lower and pedestrian crossings shorter, designers may consider the use of unsignalized crossing treatments such as medians, hybrid or rapid flash beacons, or raised crossings."*
>
> *NACTO Urban Street Design Guide, Crosswalks and Crossings*

Municipalities can also evaluate existing crossing conditions within the transit walksheds in their jurisdiction to identify locations where crossing treatments are absent or not consistent with the roadway context. OpenStreetMap, a website for the contribution and editing of geographic features, offers crowdsourced information related to crossing conditions in the Portland region. Although this information is not consistent across the region, it may be useful in local analysis.

Strategy 2, Action C

Develop local guidance to implement policies regarding the co-location of crossings with transit stops and stations

LED BY

Counties and local municipalities; TriMet

DESCRIPTION

Section 3.08.120 (Transit System Design) of the Regional Transportation Functional Plan directs cities and counties to "include investments, policies, standards and criteria to provide pedestrian and bicycle connections to all existing transit stops and major transit stops…"

Counties and municipalities should establish local guidelines to implement existing policies for co-locating marked crossings with all transit stops and stations. Such guidelines enable jurisdictions to identify specific treatments that complete the walking connection to and from transit, while considering their local context. It also provides the basis for recognizing a transit stop without a marked crossing as a gap in the pedestrian network. The leading example of such guidelines in the region is PedPDX (2019), the City of Portland's updated Pedestrian Plan, which established new crossing spacing guidelines and identifies crossing gaps.

Co-locating marked crosswalks with transit stops is an ongoing process that requires regular communication and coordination with TriMet, including information about transit stop relocations or consolidation and crosswalk placement. All crossing projects should consider the impacts to an existing stop, the need to fund stop improvements necessitated by crossing projects, and should work to ensure that ADA accessibility is preserved. In addition to coordinating stop spacing and locations with TriMet, jurisdictions should continue to work with TriMet to develop strategies for maintaining curb space.

The intent of this action is also to support local municipalities that have already enacted local guidance to implement these policies; in that case, this action entails TriMet and the local municipality partnering, such as on grant opportunities, to address identified crossing needs at transit stops.

Strategy 2, Action D

Create universally accessible routes to transit

LED BY

Counties and local municipalities; ODOT

DESCRIPTION

Walking to transit should be an option for all transit riders. Applying universal design principles increases that likelihood by seeking design outcomes that are as usable as possible by as many people as possible regardless of age, ability or situation. This includes adhering to the requirements of the Americans with Disabilities Act (ADA) and accessibility guidelines for public facilities in the right of way (PROWAG), while also expanding that to design for social inclusion that exceeds minimum requirements. Examples of guidance included in the Los Angeles County Metropolitan Transportation Authority (LA Metro) First Last Mile Strategic Plan[10] include:

- "Mobility infrastructure must consider the slower speeds of pedestrians using canes, especially at street crossings. Tiered signalization programs that allow for longer crossing times should be considered long transit access routes."
- "Sidewalks and routes to transit nodes must maintain smooth and clear rolling surfaces, accessible curb ramps, and signal times conducive to safe street crossings."
- "Alterations to traffic signals… require noise enhancements to account for the visually impaired. Routes to transit nodes will benefit from the use of tactile wayfinding strategies. "
- "[Mobility scooters] are constantly evolving; they are gaining power, speed, range and stability. New design guidelines to facilitate the changing device should be considered…"

Implementing agencies should design for all users when implementing linear and crossing projects within transit walksheds. Counties and jurisdictions should also identify locations that are not ADA-compliant and could be retrofitted to create a universally accessible route to a transit stop or station. While retrofitting existing sidewalks, trails, and crossings can be difficult to engineer or fund, in some cases, identifying and investing in these spot improvements can eliminate a barrier for transit riders, while also providing a broader community benefit, especially as transit stops are often located near important destinations. Universal design creates a better experience for everyone.

"Transit users moving under their own power throughout the county have very different use characteristics and functional needs from one another, based both on the physical requirements of chosen mode and personal characteristics including age, ability and personal attitude towards risk and comfort. A healthy 17-year-old skateboarder has very different mobility characteristics and needs from a 91-year-old utilizing a wheeled push-walker."

First Last Mile Strategic Plan and Planning Guidelines, Los Angeles County Metropolitan Transportation Authority

Source: TriMet

Strategy 3

Make Walking and Rolling Trips to Transit Safer and More Comfortable

A 2014 study[11] found that "walkable environments, with improved sidewalk amenities and more pedestrian-friendly traffic conditions, street scale, and landscaping, are predictive of people choosing to walk rather than drive to transit." Walking routes to transit should not only be complete and connected but also safe and comfortable. Stakeholders involved in developing this Plan underscored the value of a dignified walking experience. This means human-scale design that indicates a person walking belongs there and that puts the pedestrian first, as the most vulnerable roadway user. The community survey conducted in the fall of 2019 reinforced this, with crossings and lighting identified as major factors that made it difficult to walk to a stop or station and that would influence their decision to walk to transit more. Investments in safety and comfort will not only provide a better experience for transit riders but also benefit other people walking, recreating, socializing, shopping, or living or working along an improved and vibrant street.

POLICY NEXUS

- Metro's Regional Active Transportation Plan Target for Active Transportation and Safety
- Oregon Public Transportation Plan Goal 1: Mobility, Goal 4: Equity, and Goal 6: Safety and Security

ACTIONS

A. Apply current best practices in pedestrian design

B. Include pedestrian-scale lighting within transit walksheds

C. Design for personal safety and security for people walking to transit

D. Improve the ease and speed of navigating on foot to and from transit stops

RESOURCES

- NACTO Urban Street Design Guide
- NACTO Transit Street Design Guide
- ODOT's Blueprint for Urban Design
- ODOT Highway Design Manual Appendix L Bicycle and Pedestrian Design Guide
- Metro's Designing Livable Streets and Trails Guide
- Crime Prevention Through Environmental Design (CPTED)

Strategy 3, Action A

Apply current best practices in pedestrian design

LED BY

Counties and local municipalities; ODOT; Metro

DESCRIPTION

When implementing projects within the transit walkshed, agencies should apply current best practices in pedestrian design. National guidelines, such as those offered by the National Association of City Transportation Officials (NACTO) as well as regional guides such as ODOT's Blueprint for Urban Design and Metro's Designing Livable Streets and Trails Guide, prioritize the role of safety and comfort for people walking. This includes meeting recommended or preferred design guidance whenever possible, rather than minimum requirements.

Strategy 3, Action B

Increase pedestrian-scale lighting within transit walksheds

LED BY

Counties and local municipalities; ODOT; Metro

DESCRIPTION

Pedestrian-scale lighting addresses multiple objectives identified through this planning process, including a sense of personal security, comfort and "belonging" of pedestrians when accessing transit, and improved safety. No- and low-light conditions increase the risk of pedestrian injuries or fatalities. Pedestrian-scale lighting creates a more enjoyable walking experience and increases visibility of pedestrians at intersections and at crossings. The fall 2019 survey conducted by TriMet found that safe crossings (35%) and lighting (38%) were the two most commonly cited reasons a person's walk to transit was difficult. They were also at the top of the list of what would influence a person to walk to transit more often (ranking second only to increased transit service frequency).

When implementing the projects identified in this Plan, counties, municipalities, and ODOT should include pedestrian-scale lighting in the scoping and design of each. Pedestrian-scale lighting should also be included as part of new crossing investments whenever possible. Jurisdictions should evaluate the need for new investments in lighting on existing streets within transit walksheds.

"Among bus riders, 33% of female respondents say safety while waiting at or getting to stops is an important area for improvement, compared to 25% of male respondents. Among train riders responding to the same question, 31% of female and 23% of male respondents found safety important. There is not a gender difference regarding safety on transit vehicles."

Transit Center, Who's on Board? 2019: How to Win Back America's Transit Riders (February 2019), p 58

Strategy 3, Action C

Design for personal safety and security for people walking and rolling to transit

LED BY

Counties and local municipalities; ODOT; Metro

DESCRIPTION

The experience of walking in the public right of way can vary significantly depending on a person's age, race, gender, ethnicity, ability, and income. This can mean increased concerns for personal safety and security for women, people of color, and the LGBTQ community. When asked what factors make walking to transit difficult, community survey respondents referenced their personal safety as a major concern. Designing for safety and comfort is critical to not only providing the choice to walk to transit but doing so in a way that is dignified and enjoyable.

When implementing the projects identified in this Plan, counties, municipalities, and ODOT, should incorporate design elements that contribute to personal safety. Street lighting and pedestrian-scale lighting (Strategy 3, Action c) is one element. Crime Prevention Through Environmental Design (CPTED) should be routinely applied to the scoping and design of pedestrian projects within transit walksheds. The CPTED approach uses urban and architectural design and management of the built and natural environment to deter crime and contribute to the sense of community that minimizes crime and fear of crime. Effective investments in design elements that provide a sense of safety can reduce reliance on policing or enforcement as crime deterrent tactics. Increased policing and enforcement can, in some cases, increase a community's sense of fear and create new concerns.

Strategy 3, Action D

Improve the legibility of navigating on foot or by mobility device to and from transit stops

LED BY

Counties and local municipalities; ODOT; Metro

DESCRIPTION

Expanding wayfinding signage within transit walksheds can improve the legibility of pedestrian routes on both ends of a transit trip. Depending on the local jurisdiction, this may involve expanding an existing wayfinding program to more fully cover transit walksheds, or creating a new wayfinding program. Municipalities should coordinate wayfinding efforts with TriMet to align with existing wayfinding signage at and near stops and stations, as well as established partnerships with interested or affected neighborhood associations and downtown and business associations. An effective signage program will not only provide redundancy with digital route planning tools (including TriMet's Trip Planner, Google maps, and smart phone apps) but also support multimodal trip-making. Nearly 15% of the community survey participants indicated that digital route planning apps were not well suited for walking and that this affected their walking experience. New investments in wayfinding may be able to leverage new technology, such as dynamic signage with real-time transit updates, and travel time.

Source: TriMet

Strategy 4

Better Communicate and Coordinate on Pedestrian Improvements

Access-to-transit projects directly impact transit service opportunities and yet are provided by and in the purview of government agencies fully outside of TriMet. Effective coordination to initiate and deliver those projects is critical to the goals of TriMet, as well as local jurisdictions.

POLICY NEXUS

- Oregon Public Transportation Plan Goal 9: Funding and Strategic Investment and Goal 10: Communication, Collaboration, and Coordination

ACTIONS

A. Share technical resources for implementing this Plan

B. Engage each other as stakeholders in project delivery

C. Generate community awareness of the Plan

RESOURCE

- Federal Transit Administration Manual on Pedestrian and Bicycle Connections to Transit
- TriMet Bus Stops Guidelines
- ODOT's Public Involvement in Transportation Planning Guidance
- Metro's Public Engagement Guide
- Metro's Strategic Plan to Advance Racial Equity, Diversity, and Inclusion

"People will be more likely to walk and bike to transit if they hear about these modes, know people who are trying them, and have positive experiences."

Federal Transit Administration Manual on Pedestrian and Bicycle Connections to Transit (August 2017), p 5

Strategy 4, Action A

Share technical resources for implementing this Plan

LED BY

TriMet, with active involvement from counties and municipalities; Metro

DESCRIPTION

TriMet should share the work products of the Pedestrian Plan with implementing agencies. The process to plan, fund, and scope proposed projects will be easier and more efficient for staff at every partner agency if they have direct access to datasets, analyses, and GIS shapefiles. With this Plan's completion, TriMet can provide:

- An ArcGIS database of pedestrian access to transit projects with attributes that provide a rationale for project value and relative priority score
- An online interactive map that provides a digital, easily accessible reference to identified projects along with project details, and can serve as a platform for ongoing communicating and sharing updates to project information

These resources are intended to be easily accessible tools for technical staff who need to develop work plans, inform decision-making, and document anticipated project benefits.

Strategy 4, Action B

Engage each other as stakeholders in project delivery

LED BY

Counties, municipalities, ODOT, TriMet, and Metro

DESCRIPTION

First-and last-mile access to transit is an explicitly multimodal and multi-agency issue. However, TriMet's authority is limited to the stop or station; roadway owners and local governments have the authority for planning and building infrastructure to support the experience before or after a transit trip. TriMet and jurisdictions should continue to develop new and better ways to coordinate on project delivery and communicate about transit rider needs. This includes sustained and/or increased involvement of TriMet Planning and Policy staff in:

- The development review process when projects fall within transit access sheds
- Scoping and design of projects that fall within transit access sheds
- Preparation of TSPs and modal plans

As a project stakeholder, TriMet can bring technical guidance related to the specific profile and needs of transit users within each community. This may include sharing information about who in the community uses transit and how they use it, with an opportunity to inform the planning and design questions related to what local transit riders need and how to best serve them with a given project.

Strategy 4, Action C

Generate community awareness of the Plan

LED BY

Counties and municipalities, with TriMet and Metro

DESCRIPTION

Counties and municipalities may benefit from local community outreach to spark interest in and build political will for the projects and actions included in this Plan. Communicating the purpose of the Plan reinforces the message that walking to transit is a valued choice. The recommendations of the Plan may also reinforce existing local policy related to multimodal transportation options and designing complete streets. Local jurisdictions can utilize the work products and informational and graphic materials created through the planning process to illustrate Plan recommendations, or modify existing materials to create locally-relevant descriptions of priorities for pedestrian access to transit.

> *"People will be more likely to walk and bike to transit if they hear about these modes, know people who are trying them, and have positive experiences."*

Federal Transit Administration Manual on Pedestrian and Bicycle Connections to Transit (August 2017), p 5

Endnotes

1 Jenny Liu and Jennifer Dill, Understanding Economic and Business Impacts of Street Improvements for Bicycle and Pedestrian Mobility - A Multi-City Multi-Approach Exploration (2019). https://trec.pdx.edu/research/project/1031/Understanding_Economic_and_Business_Impacts_of_Street_Improvements_for_Bicycle_and_Pedestrian_Mobility_-_A_Multi-City_Multi-Approach_Exploration

2 SmartGrowth America and National Complete Streets Coalition, Safer Streets, Stronger Economies: Complete Streets project outcomes from across the country, March 2015. Retrieved from: https://www.smartgrowthamerica.org/app/uploads/2016/08/safer-streets-stronger-economies.pdf

3 Clifton, Kelly; Muhs Christopher; Morrissey, Sara; Morrissey, Tomas; Currans, Kristina; Ritter, Chloe, Consumer Behavior and Travel Mode Choices. Oregon Transportation Research and Education Consortium. November 2012.

4 Political Economy Research Institute (Heidi Garrett-Peltier), Pedestrian and bicycle infrastructure: A national study of employment impacts (June, 2011) https://bikeleague.org/sites/default/files/PERI_Natl_Study_June2011.pdf

5 SmartGrowth America and National Complete Streets Coalition, Safer Streets, Stronger Economies: Complete Streets project outcomes from across the country, March 2015. Retrieved from: https://www.smartgrowthamerica.org/app/uploads/2016/08/safer-streets-stronger-economies.pdf

6 Vision Zero Network. https://visionzeronetwork.org/

7 SmartGrowth America and National Complete Streets Coalition, Safer Streets, Stronger Economies: Complete Streets project outcomes from across the country, March 2015. Retrieved from: https://www.smartgrowthamerica.org/app/uploads/2016/08/safer-streets-stronger-economies.pdf

8 Health Benefits Of Public Transportation. TransLok. June 25, 2013 https://blog.transloc.com/blog/6-health-benefits-of-public-transportation

9 Tilahun, N., and Li, M. 2015. Walking access to transit stations: Evaluating barriers with stated preference. Transportation Research Record, No. 2534, pp. 16-23.

10 First Last Mile Strategic Plan and Planning Guidelines, Los Angeles County Metropolitan Transportation Authority (LA Metro), Taxonomy of Mobility Devices Appendix (pages 29, 31, 34, and 40, respectively)

11 Park, S., Deakin, E., & Lee, J. S. (2014). Perception-Based Walkability Index to Test Impact of Microlevel Walkability on Sustainable Mode Choice Decisions. Transportation Research Record, 2464(1), 126–134. https://doi.org/10.3141/2464-16

Appendices

Appendix A: Historic Background

Appendix B: Policy & Institutional Framework

Appendix C: Analysis Methodology and Results

Appendix D: Community Engagement Summary Memos

Appendix E: Prioritized Project List

Appendix F: High Priority Transit Stops for Further Evaluation of Pedestrian Needs

Appendix G: Maps and Prioritization Results

A

Historic Background

B

Policy & Institutional Framework

C

Analysis Methodology & Results

D

Community Engagement Summary Memos

E

Prioritized Project List


F
Transit Stop
Prioritization

G

Maps & Prioritization Results