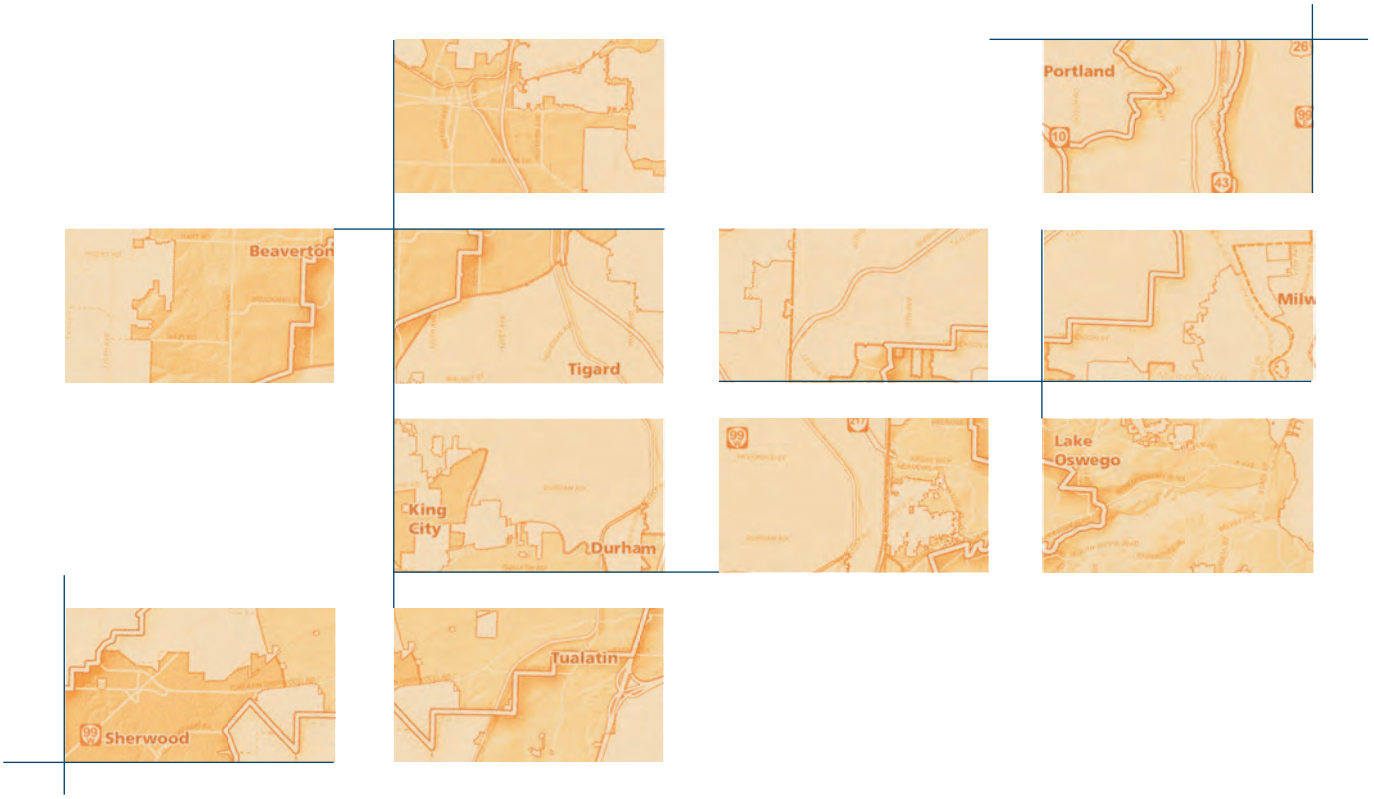

GREAT PLACES

SW Corridor Plan

Evaluation Report

Transit
Roadway
Active Transportation

June 2013

PROJECT PARTNERS

Cities of Beaverton, Durham, King City, Lake Oswego, Portland, Sherwood, Tigard and Tualatin, Multnomah and Washington counties, Oregon Department of Transportation, TriMet and Metro

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

The Joint Policy Advisory Committee on Transportation (JPACT) is a 17-member committee that provides a forum for elected officials and representatives of agencies involved in transportation to evaluate transportation needs in the region and to make recommendations to the Metro Council. The established decision-making process assures a well-balanced regional transportation system and involves local elected officials directly in decisions that help the Metro Council develop regional transportation policies, including allocating transportation funds.

Project website: www.swcorridorplan.org

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Introduction

The Southwest Corridor Plan is a comprehensive land use and transportation planning study to identify and prioritize public investments in the corridor between downtown Portland and Sherwood. It includes an integrated investment strategy, transportation plan, a high capacity transit (HCT) alternatives analysis, and four land use plans.

Purpose

The purpose of the Southwest Corridor Plan evaluation process is to assist in narrowing alternatives and defining what to continue studying to allow future definition of a preferred investment strategy for the corridor. This document provides a summary of the evaluation of proposed HCT, roadway and active transportation projects in the Southwest Corridor. Decision makers will consider a wide array of needs and opportunities in the corridor to determine which projects to include in the regional integrated investment strategy and for further refinement in next phase of the SW Corridor Plan. The intent of this document is to establish the foundation for decisions about what should be considered further during the Refinement Phase of the Southwest Corridor Plan.

Existing Conditions

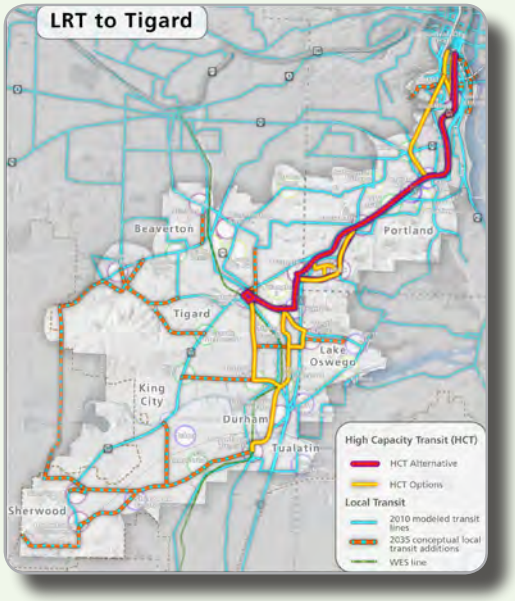
The Southwest Corridor offers a high level of services and opportunities to live, work, learn and play. It has a variety of livable neighborhoods along with numerous educational facilities, employment opportunities, community assets, and transportation facilities. However, the corridor also has congested roadways and the road network and pedestrian and bicycle facilities lack convenient connections in many locations.

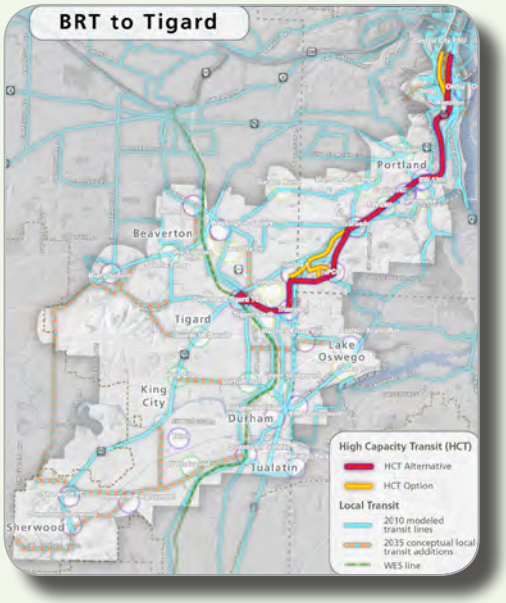
Major destinations

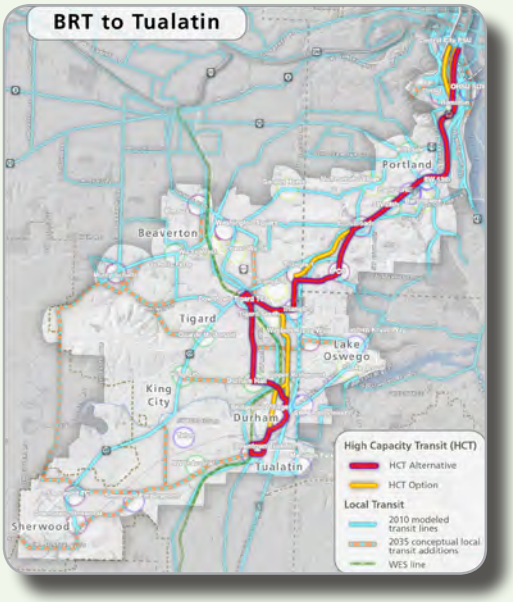
The Southwest Corridor includes several of the largest commercial, employment, educational centers, regional institutions and universities in the region. The Southwest Corridor currently has 140,412 jobs, which is 25 percent of all jobs in the Portland metro region, has 45,500 university students, and has approximately 7,500 acres of parks and natural areas, and 25 miles of regional trails. It is less than a 10 minute walk to a park, trail or natural area from almost half (45 percent) of the residential neighborhoods in the Southwest Corridor.

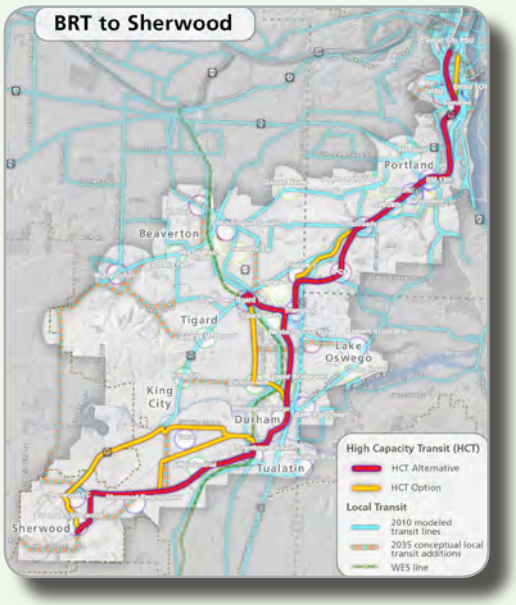
High Capacity Transit

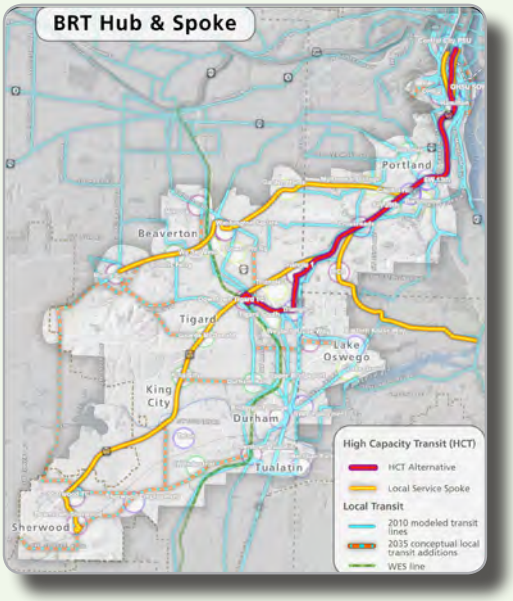
The alternatives shown in red were analyzed using the regional travel demand model. Potential impacts are analyzed at a conceptual level. Elements of each, as well as options, which are shown in yellow, would be available to mix and match to define alternatives to be studied further.











Introduction

Purpose

The purpose the analysis of the initial set of alignment and mode options for the Southwest Corridor Transportation Plan is to support decisions about what alternatives and options to continue studying during an upcoming refinement phase of the Southwest Corridor Plan. Modes evaluated included light rail (LRT) and a range of bus rapid transit (BRT) alternatives. The decisions to be made during this phase are:

- Destination (terminus)
- Mode or modes to carry forward for additional refinement for project development
- Level of investment for BRT performance.

This section focuses on the evaluation of HCT projects. The next stage of the study and analysis will provide more details on this narrowed set of alternative and options to support future decision-making about what, if any alternative to consider for further development and eventual construction.

This report also touches on the crucial issue of transit service throughout the corridor, including connections between communities in the southwest and surrounding communities, as well as connections to HCT and Westside Express Service (WES), the existing commuter rail line. A follow-on effort will engage the public, cities, counties, businesses, neighborhoods, social service providers, and other stakeholders to define the vision for substantial increases in transit service throughout the area.

Methodology

Evaluation framework

The analysis in this section is derived from the vision, goals and objectives adopted by the SW Corridor Plan Steering Committee (Steering Committee) and focuses on the following goals and objectives:

Goal: Accountability and partnership – Manage resources responsibly, foster collaborative investments, implement strategies effectively and fairly, and reflect community support.

Objectives:

- Build upon existing plans, private development and investments in public infrastructure
- Make investments that maximize limited resources
- Equitably distribute the benefits and burdens of growth geographically and demographically

Measures used to evaluate the accountability and partnership goal and objectives include:

- Capital cost magnitudes
- Transit operating costs
- Operating efficiency.

Goal: Access and mobility – People have a safe, efficient and reliable network that enhances economic vitality and quality of life.

Objectives:

- Improve access to places where people live, work, play and learn
- Improve access, mobility and safety for all transportation modes, ages and physical abilities
- Improve the freight transportation system to ensure that the region and its businesses stay economically competitive

Measures used to evaluate the access and mobility goal and objectives include:

- Ridership
- Travel time

The evaluation in this section focuses on transit performance, however planning for the SW Corridor is based on identifying the transportation and land use investments that will support the desired land uses in the plan area. Additional criteria used both for narrowing the initial wide range of projects and for developing draft recommendations are derived from the four goals

and associated objectives adopted by the Steering Committee.

High Capacity Transit Alternatives

The Steering Committee approved five project "bundles"—each of which included an HCT mode, alignment and alignment options—to evaluate as a step toward identifying an investment strategy. While each bundle included a set of roadway and active transportation projects, the HCT alternatives were analyzed with identical roadway networks to isolate effects of the various transit assumptions.

The HCT alternatives are representative of a wide array of options, from which the Steering Committee can mix-and-match to define alternatives for future continued analysis. Each HCT alternative was evaluated on one representative baseline alignment. Alignment options were identified, but were not included in modeling. The modeling process is described below. Alignments and options are described on the following pages.

Modeling

The assumptions for lane characteristics and general station locations were developed for each baseline alignment. A range of lane treatments and routing options were ascribed to the alternatives in order to provide a breadth of information to inform decisions on what to carry forward.

Key inputs included:

- The regionally adopted land use for the four-county area
- Data from Metro's Household and Travel Behavior Study, which incorporates travelers' propensities to make certain types and lengths of trips
- The 2035 Regional Transportation Plan (RTP) Financially Constrained roadway network
- Specific road characteristics such as number of lanes, capacity, and speed limits
- The 2035 RTP Financially Constrained transit network with modifications representing initial concepts of TriMet's Service Enhancement Plan
- Each HCT baseline alignment and service, specifying mode, general stop locations, speeds, and interaction with traffic, and local transit service adjustments identified by TriMet.

Key outputs include:

- Transit travel times
- Transit ridership by line and by stop/station
- System transit trips
- Mode share
- Vehicle miles traveled and vehicle hours traveled by mode.

Capital cost analysis

Given that the region has decades of experience with LRT, but none with BRT, establishing a cost magnitude range for LRT is more certain. The service provided by LRT, especially since it is within an existing system is well understood, while the range of service that can be provided by BRT is quite broad. Defining the type and amount of service within that range is necessary to produce meaningful costs. Having reliable costs for LRT but not BRT makes reliable comparisons difficult. Therefore, costs for both modes should be considered preliminary and only for the purposes of magnitudes for comparison, not actual budgets for any alternative.

Cost magnitudes were developed for some alignment options, again, as representative information to help decide among broad distinctions in alternatives. More refined decisions in the future will be based on more detailed information to be develop in the next phase of the study based on the Steering Committee's direction.

Alternatives Previously Considered and Removed

In October 2012, the initial wide range of alternatives was narrowed to the 5 alternatives analyzed in this report. Alternatives were judged based on the following criteria:

1. Is the alternative consistent with the project's vision, goals, and objectives?
2. Does it address the transportation needs in the corridor?
3. Does it support land use goals?
4. Does it protect or enhance the existing facilities?
5. When can we afford it?
6. Are the impacts reasonable?

After scoring based on the criteria, the following options were removed from consideration:

Extension of LRT or extension of transit-exclusive right-of-way BRT to Sherwood

Transportation needs analysis indicated that the trip demand from Sherwood to the rest of the corridor is not at, nor forecast to reach a level that would require HCT. Sherwood would be best served by local bus connections to nearby communities.

Westside Express Service (WES) improvements

WES improvements would have the highest property impact magnitude and the highest operating costs per boarding of the representative projects studied. WES serves circumferential travel demand in this corridor but not demand along the spine of the corridor. Improvements would only serve the limited locations that already have WES service, and would not sufficiently support identified land use goals within the corridor. The WES corridor (Beaverton to Wilsonville) ranks as a Near Term Regional Priority Corridor in Metro's High Capacity Transit System Plan. As such, WES merits further analysis as part of a corridor study separate from the Southwest Corridor Plan.

I-5 options to convert a lane or add a lane for HOV/HOT/BRT use

I-5 options would not support the SW Corridor Land Use Vision. The SW Corridor Plan integrates local land use plans with transit and other investments. Nearly all of the identified focus areas in the corridor are not near enough to freeway accesses for freeway-based transit to serve them effectively, and physical barriers would make new accesses difficult.

Streetcar options

Streetcar is most effectively utilized as an urban city circulator and not as a long-distance HCT mode (where BRT or LRT is more typical).

Tigard Triangle and OR-99W

In addition to these alternatives being removed, the Steering Committee agreed that HCT to Tigard or through Tigard to points beyond should be routed through the Tigard Triangle, and not on OR-99W southwest of the Interstate 5 intersection. Instead, OR-99W in this part of the corridor should continue to be served by local bus service. This decision was made in consideration of the following:

- The Tigard Triangle encompasses several important identified focus areas that would not be served by HCT on OR-99W.
- Strong local concerns were expressed regarding potential traffic impacts on OR-99W if auto lanes were converted for HCT, and about potential impacts to businesses along OR-99W if right-of-way were acquired for HCT.
- Southwest of its intersection with Interstate 5, OR-99W is designated as a Regional Freight Route, State Freight Route, and "Reduction Review" Route (ORS 366.215 route, in which adequate clearance is intended to be maintained for freight loads that are wider and taller than typical loads). Converting roadway capacity for transit uses here would be difficult.

Description of Alternatives Modeled: LRT to Tigard

The Light Rail alternative (figure 1-1) was evaluated with the following initial assumptions:

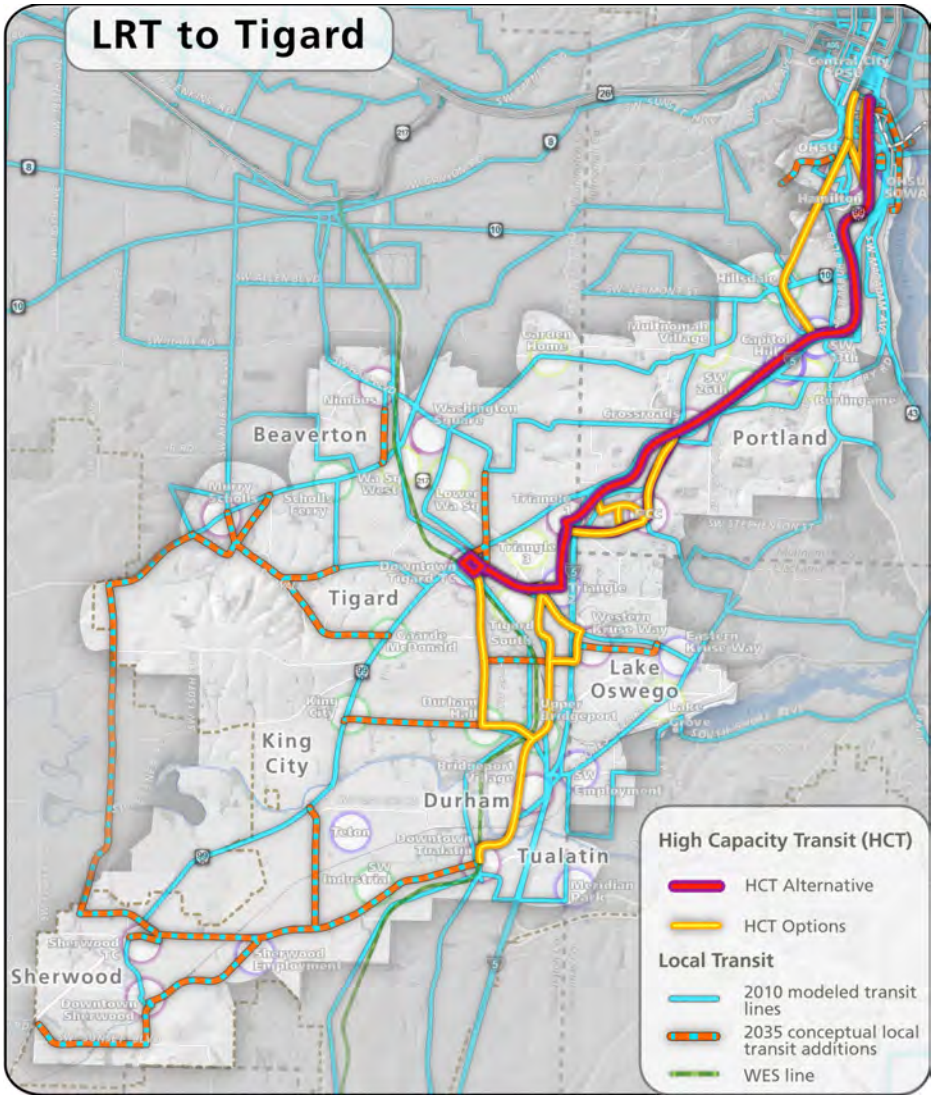
- Exclusive transit right of way
- A representative assumption of a combination of converting lanes for approximately 40 percent of the alignment and adding lanes for the remaining 60 percent
- An alignment on Naito south of downtown Portland
- Alignment on Barbur that would require a walk less than 1/3 mile to the edge of the Portland Community College (PCC) campus.

Alignment options include:

- An alignment on Barbur or a tunnel under Oregon Health & Science University (OHSU) south of downtown Portland
- Direct access to PCC campus
- An extension to Tualatin with alignment options on SW Hall or SW 72nd.

Each of these options could have sub-options with detailed routing to be determined in future stages.

Figure 1-1. LRT to Tigard



Description of Alternatives Modeled: BRT to Tigard

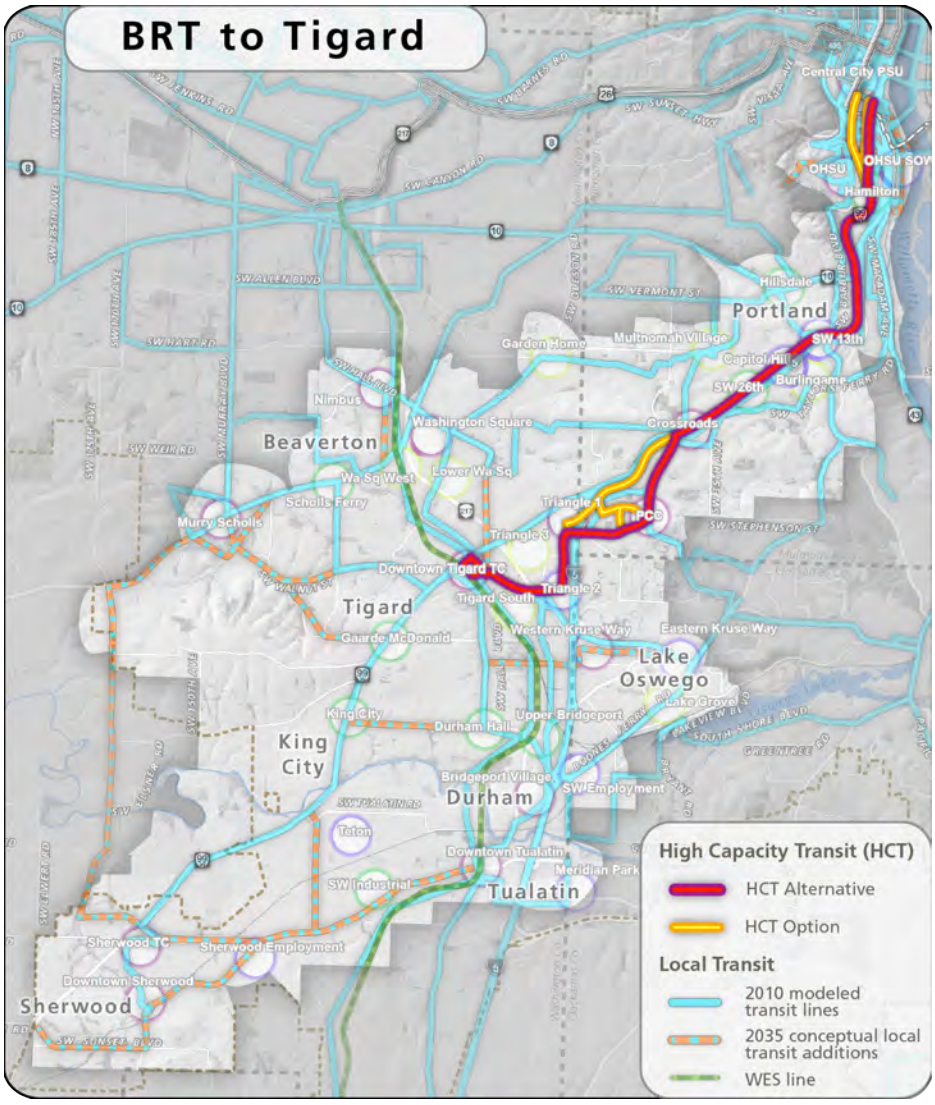
The BRT to Tigard alignment (figure 1-2) was evaluated with the following initial assumptions:

- Exclusive transit right of way
- An added transitway for the entire length that assumed no impact on motor vehicle travel lanes
- An alignment on Naito south of downtown Portland
- Access to PCC with a new connection that skirts the edge of the campus.

Alignment options include:

- An alignment on Barbur south of downtown Portland
- An alignment on Barbur that would require a walk less than 1/3 mile to the edge of the PCC campus.

Figure 1-2. BRT to Tigard



The BRT to Tualatin alignment (figure 1-3) was evaluated assuming a mix of lane configurations. The numbered list below corresponds to the segments shown in figure 1-4 and describes the initial assumptions made in each segment:

1. Service in mixed traffic southbound; one lane converted to a business access and transit (BAT) lane northbound. BAT lanes are curbside lanes that restrict motor vehicles to immediate right turns to businesses and intersecting streets, but allow buses to travel continuously through intersections.
2. BAT lanes southbound; mixed traffic northbound
3. Mostly in mixed traffic with access to PCC on a new connection that skirts the edge of the campus via a new exclusive transitway.
4. Exclusive transit lanes on Hall Blvd. southbound; mixed traffic northbound
5. Exclusive right of way both directions
6. Mixed traffic.

Figure 1-4. BRT to Tualatin segments

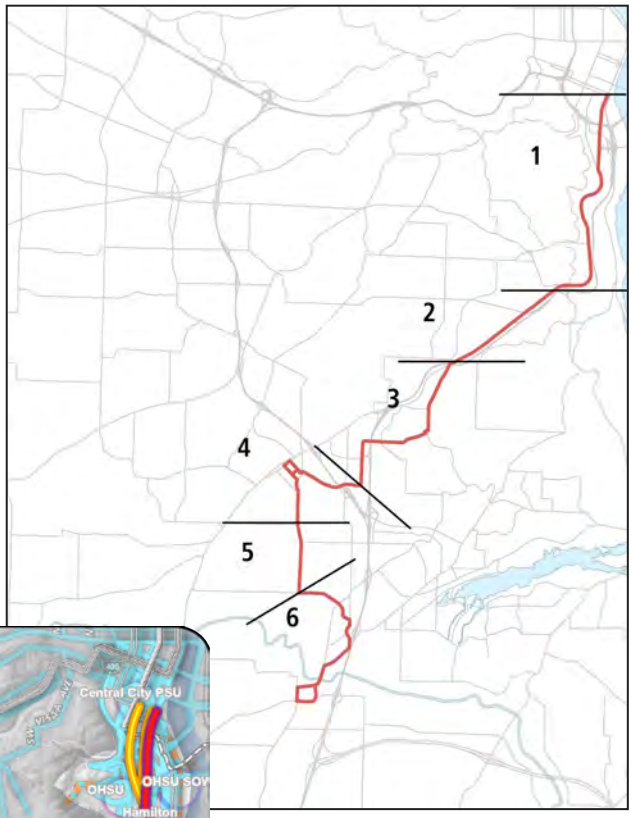
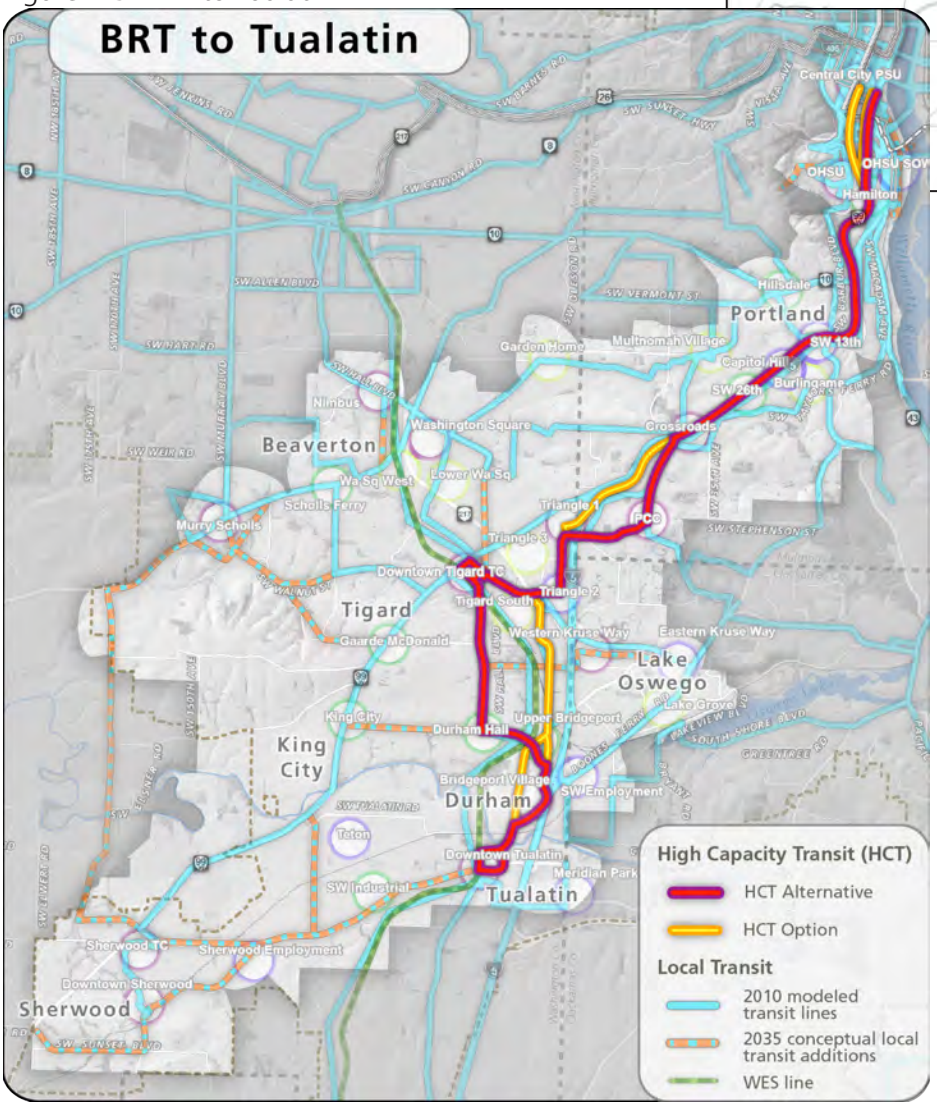


Figure 1-3. BRT to Tualatin



Alignment options include:

- An alignment on Barbur south of downtown Portland
- An alignment on Barbur that would require a walk less than 1/3 mile to the edge of the PCC campus
- An alignment on 72nd between Tigard and Tualatin.

Description of Alternatives Modeled: BRT to Sherwood

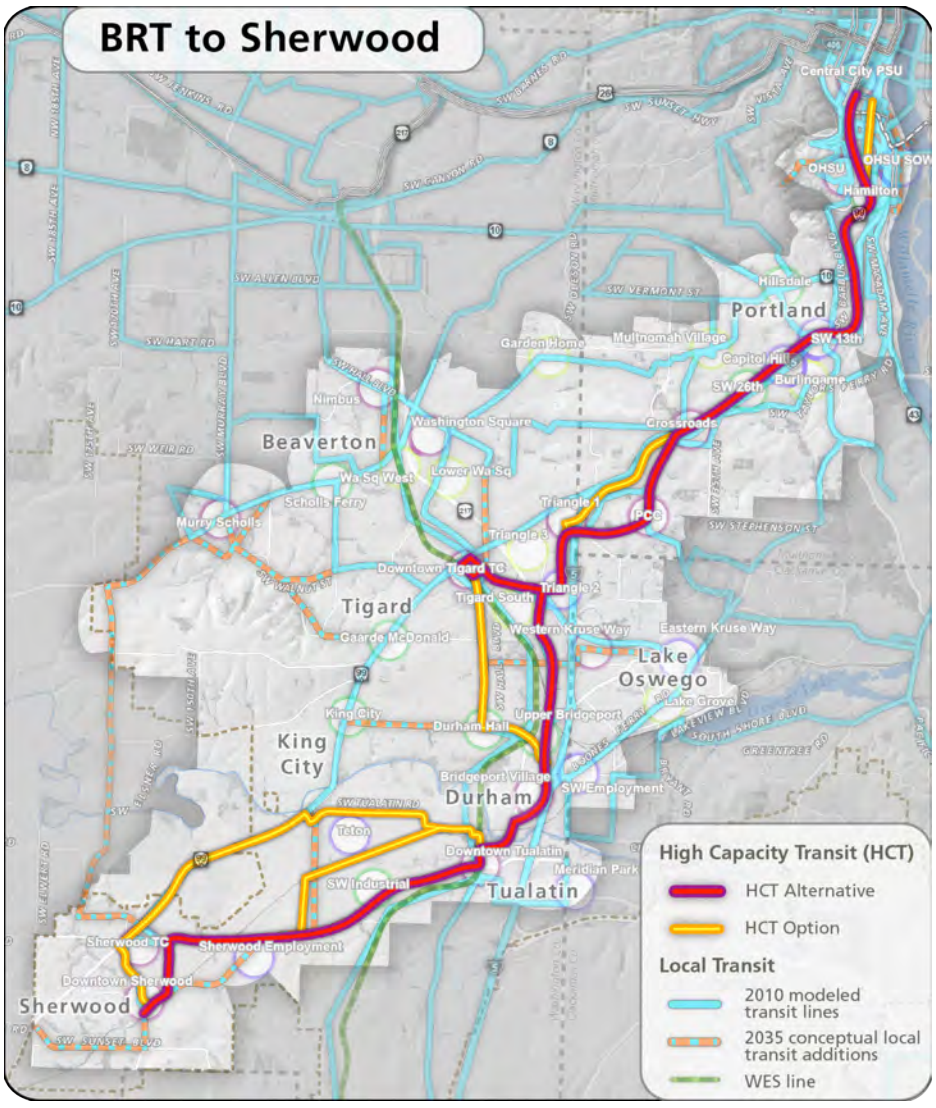
BRT to Sherwood (figure 1-5) was evaluated with the following initial assumptions:

- Service primarily in mixed traffic
- Targeted queue bypass lanes
- An alignment on Barbur south of downtown Portland
- Access to PCC with a new connection that skirts the edge of the campus
- An alignment on Tualatin-Sherwood Road between Tualatin and Sherwood.

Alignment options include:

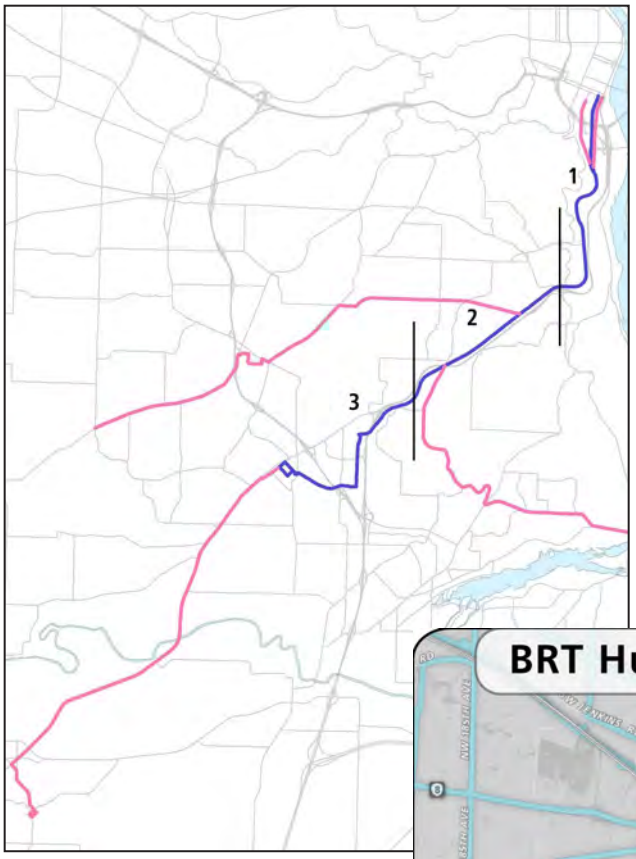
- An alignment on Naito south of downtown Portland
- Alignment on Barbur that would require a walk less than 1/3 mile to the edge of the PCC campus
- An alignment on Hall Boulevard between Tigard and Tualatin
- An alignment on Tualatin Road and Highway 99 between Tualatin and Sherwood
- An alignment on Herman Road and 124th between Tualatin and Sherwood.

Figure 1-5. BRT to Sherwood



Description of Alternatives Modeled: BRT Hub & Spoke

Figure 1-6. BRT Hub & spoke segments



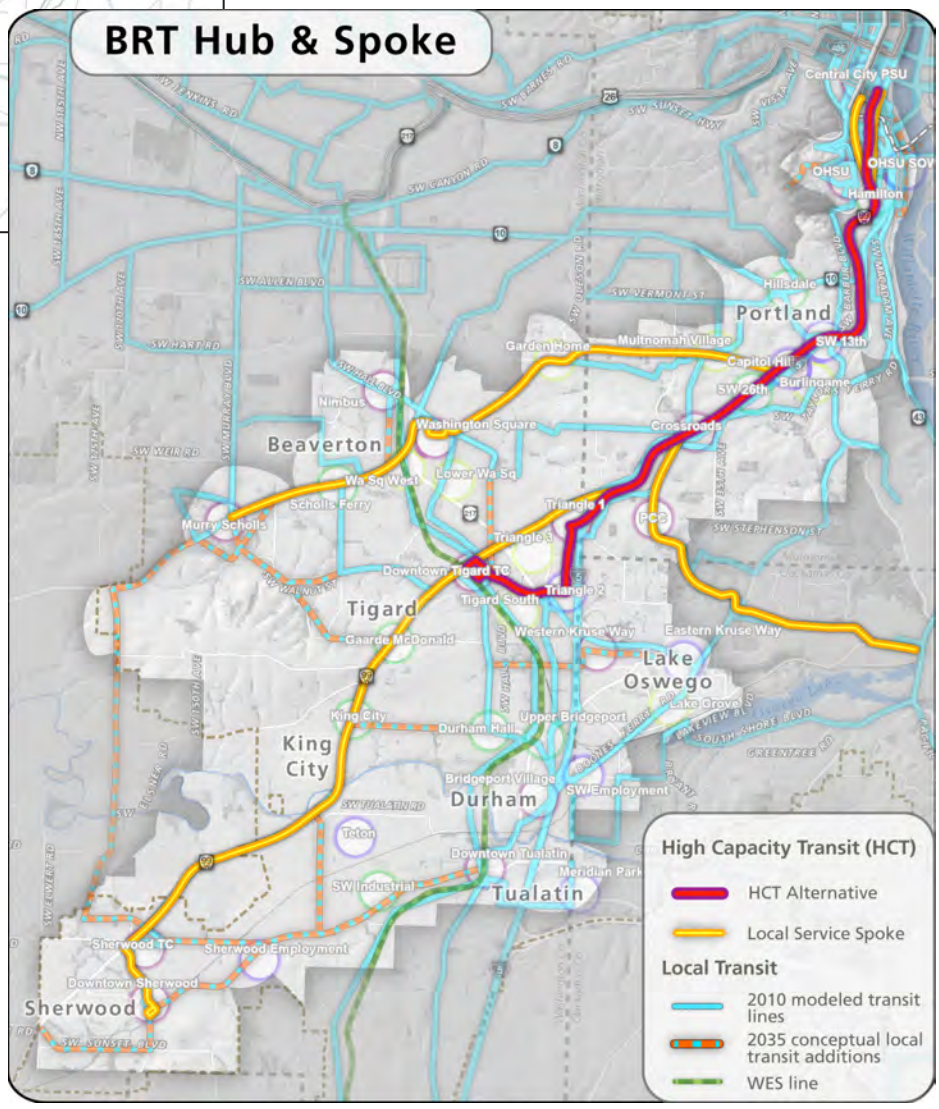
Alignment options include:

- An alignment on Barbur south of downtown Portland.

The BRT Hub & Spoke alternative (figure 1-7) was evaluated with a representative assumption of a combination of lane configurations. BRT would travel between Portland and Tigard. Local buses using the spoke segments would also use the mainline alignment and benefit from those BRT improvements, but would operate in mixed traffic when not on the Barbur mainline. The numbered list below corresponds to the segments shown in figure 1-6.

1. Mixed traffic
2. BAT lanes southbound; mixed traffic northbound
3. Mixed traffic, with exclusive transitway on new structure over I-5 south of the Crossroads area accessing the Tigard Triangle.

Figure 1-7. Hub & Spoke



Mode: Comparison of Light Rail and Bus Rapid Transit

Figure 1-8. LRT to Tigard

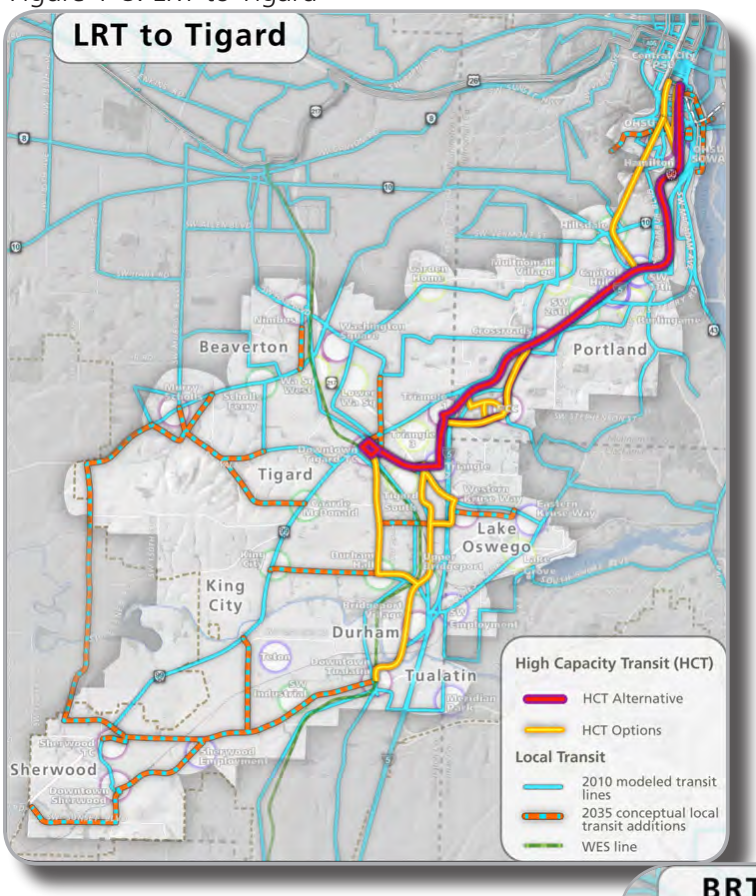
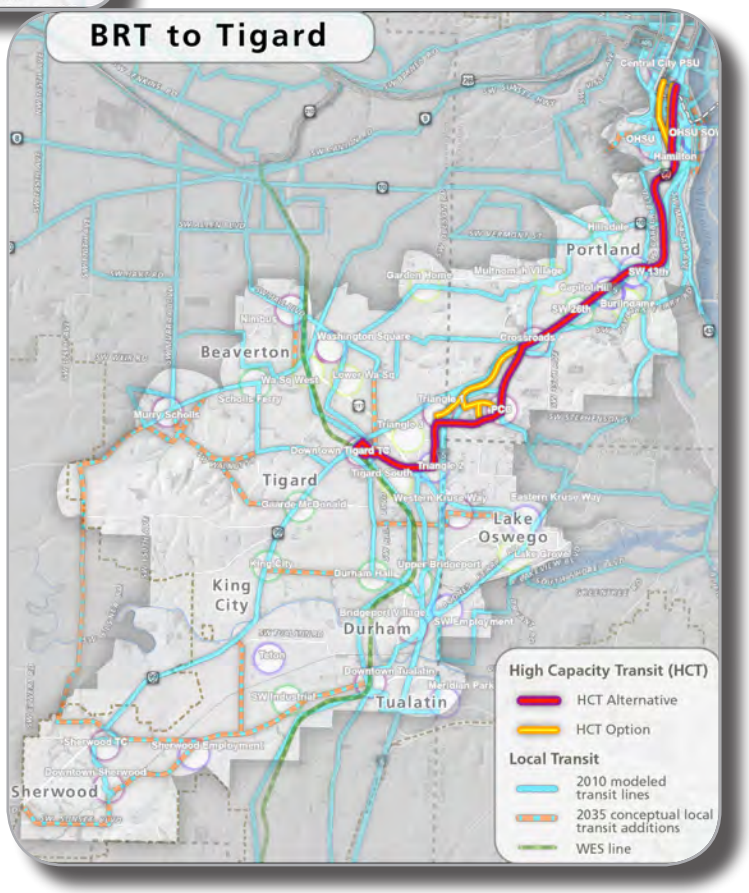


Figure 1-9. BRT to Tigard



The two modes under consideration are light rail transit (LRT) and bus rapid transit (BRT), with BRT having a range of options in terms of exclusivity of travel lanes and intersection treatments. Of the BRT alternatives, the BRT to Tigard is the most comparable to the LRT alternative analyzed, as both would terminate in Tigard. See figures 1-8 and 1-9.

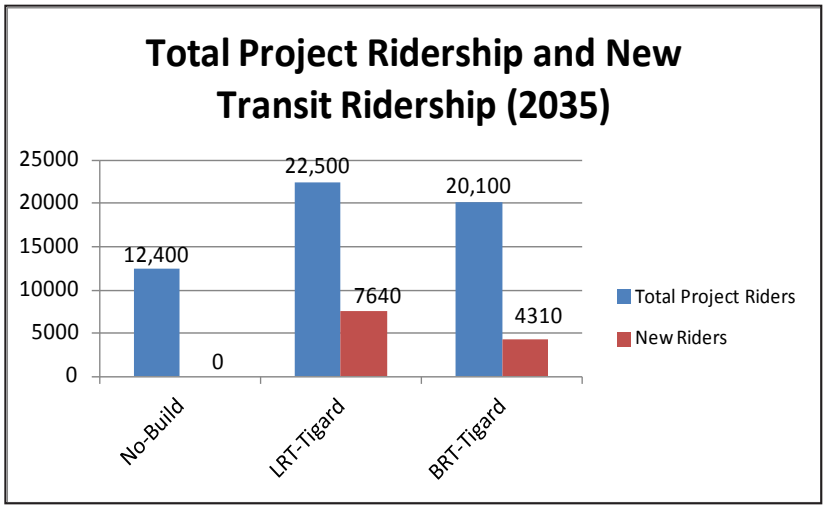
Ridership

Total project ridership counts the number of riders on the HCT line in the Southwest Corridor in 2035 on an average weekday. For the No-Build, this measure includes riders on bus lines 12 and 94 between Portland and Tigard; in the two HCT alternatives it includes riders on the HCT lines only. New transit ridership measures the difference in average weekday transit ridership compared to the No-Build for the entire transit system. New riders are included in total project ridership.

LRT to Tigard would have 22,500 average weekday total project riders, and the BRT to Tigard would have 20,100 riders, compared to 12,400 for the No-Build (figure 1-10). LRT to Tigard would attract 7,640 new riders to transit while BRT to Tigard would attract 4,300 new riders to transit on an average weekday.

LRT to Tigard and BRT to Tigard were modeled with different routing to serve PCC, which explains some of the difference in ridership. The BRT was routed to serve the PCC campus directly via Capitol Highway and SW 49th Avenue, with stops on SW Capitol at SW Pomona and a stop on campus. The LRT alignment was on Barbur Boulevard below campus and included a single station on Barbur at SW 53rd Avenue, less than 1/3 mile of the edge of the campus. This alternative and all alternatives on Barbur included a new assumed park and ride lot on ODOT property between I-5 and Barbur that resulted in 840 transit riders. Routing via Capitol Highway/SW 49th Avenue would result in nearly 2,400 more riders than routing on Barbur, with 6,370 average weekday riders using two BRT stations compared to 4,010 daily riders using one LRT station on Barbur. However, most of the additional riders on BRT would use the line 44 in the No-Build alternative, which would serve PCC in the No-Build and in the LRT alternative but was rerouted in the BRT alternative to avoid duplicating BRT service. With different assumptions in HCT or local service routing, the BRT and LRT ridership would be similar in this section.

Figure 1-10. Ridership



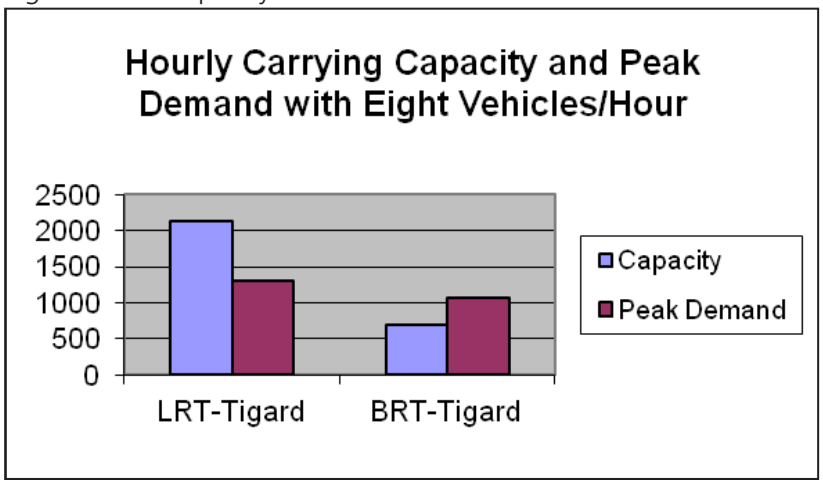
Mode: Comparison of Light Rail and Bus Rapid Transit

Service Levels

All HCT alternatives were modeled for the peak demand hours assuming 7.5 minute headways (8 vehicles per hour). For BRT to Tigard, however, those service frequencies were not sufficient to accommodate the peak load point (the location with the highest ridership during the peak hour in the peak direction). Though peak loads for the LRT alternative were higher than those for the BRT alternative, LRT was able to accommodate the demand because of the greater passenger carrying capacity of LRT vehicles (266 for LRT compared to 87 for BRT). See figure 1-11.

In order to accommodate the peak demand, service frequencies for BRT to Tigard need to increase to 13 vehicles per hour (4.6 minute headways) assuming the BRT is served with 60-foot articulated vehicles. See figure 1-12.

Figure 1-11. Capacity and Peak Demand



Change in Annual Corridor Operating Costs

Annual corridor operating costs are based on the vehicle hours traveled for all transit service in the corridor. Vehicle hours depend on the length of each transit route and the number of vehicles in operation. Costs for the trunk corridor routes (the 12 and 94 in the No-Build, HCT lines in the build alternatives) are based on the number of buses in operation required to accommodate the peak demand for each line. The annual operating costs of the LRT alternative would be $4.9M more than the No-Build, and the annual operating costs of the BRT would be $6.3M more than the No-Build in 2035 (figure 1-13). Annual operating costs for LRT would be lower than those for BRT because although a single LRT vehicle costs more per hour to operate than a single BRT vehicle, fewer vehicles and operators would be required to accommodate the peak demand.

Also, since LRT would interline with existing LRT service it would, in effect, serve as an extension of an existing line. Therefore, there would be no additional operating costs on the downtown Portland transit mall section of the route. Since BRT would be a new mode and could not interline with other service, additional operating costs would accrue for BRT on the transit mall.

Figure 1-12. Peak Period Frequency

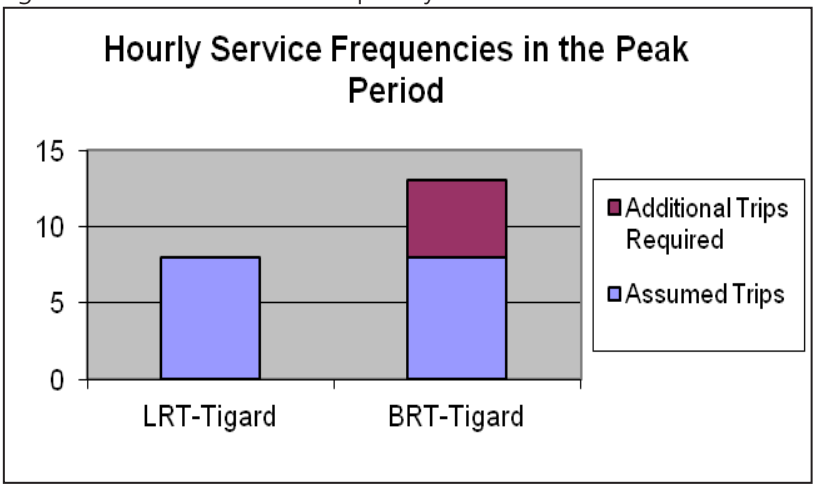
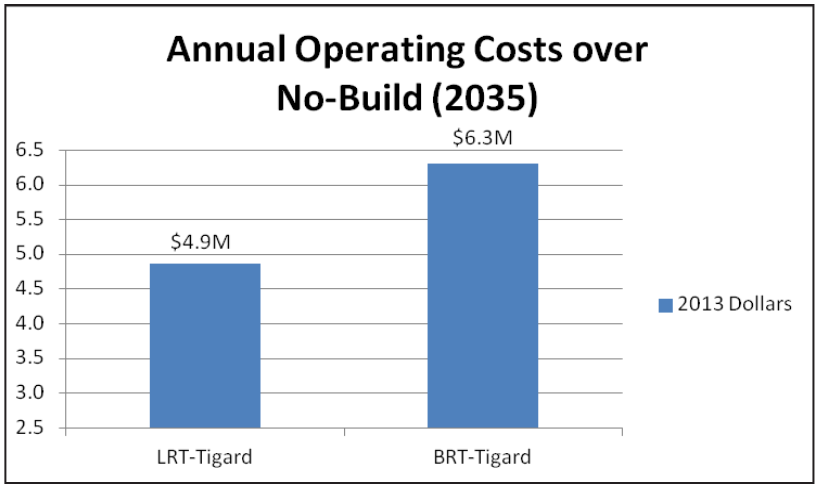


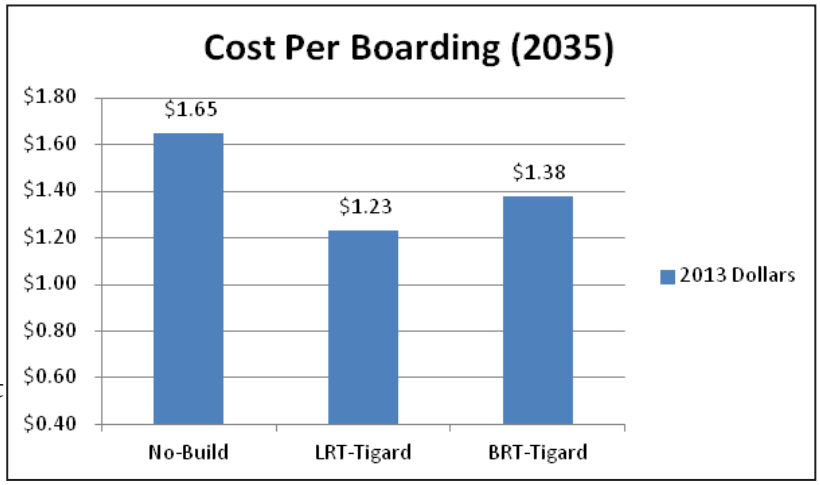
Figure 1-13. Annual Operating Costs



Operating Efficiency

Operating efficiency is measured by cost per boarding of each corridor trunk line (the 12 and 94 in the No-Build, HCT lines in the build alternatives), calculated by dividing the annual operating costs of each HCT line by its annual boardings. These values, expressed as dollars per boarding, are useful in comparing the modeled alternatives, but are not directly comparable with TriMet's reported cost per boarding for current bus routes as TriMet's service hours are calculated differently compared to the travel demand model's vehicle hours.

Figure 1-14. Cost per Boarding



Cost per boarding for both LRT and BRT to Tigard would be less than cost per boarding for the local trunk lines in the No-Build, due to the increases in ridership (figure 1-14).

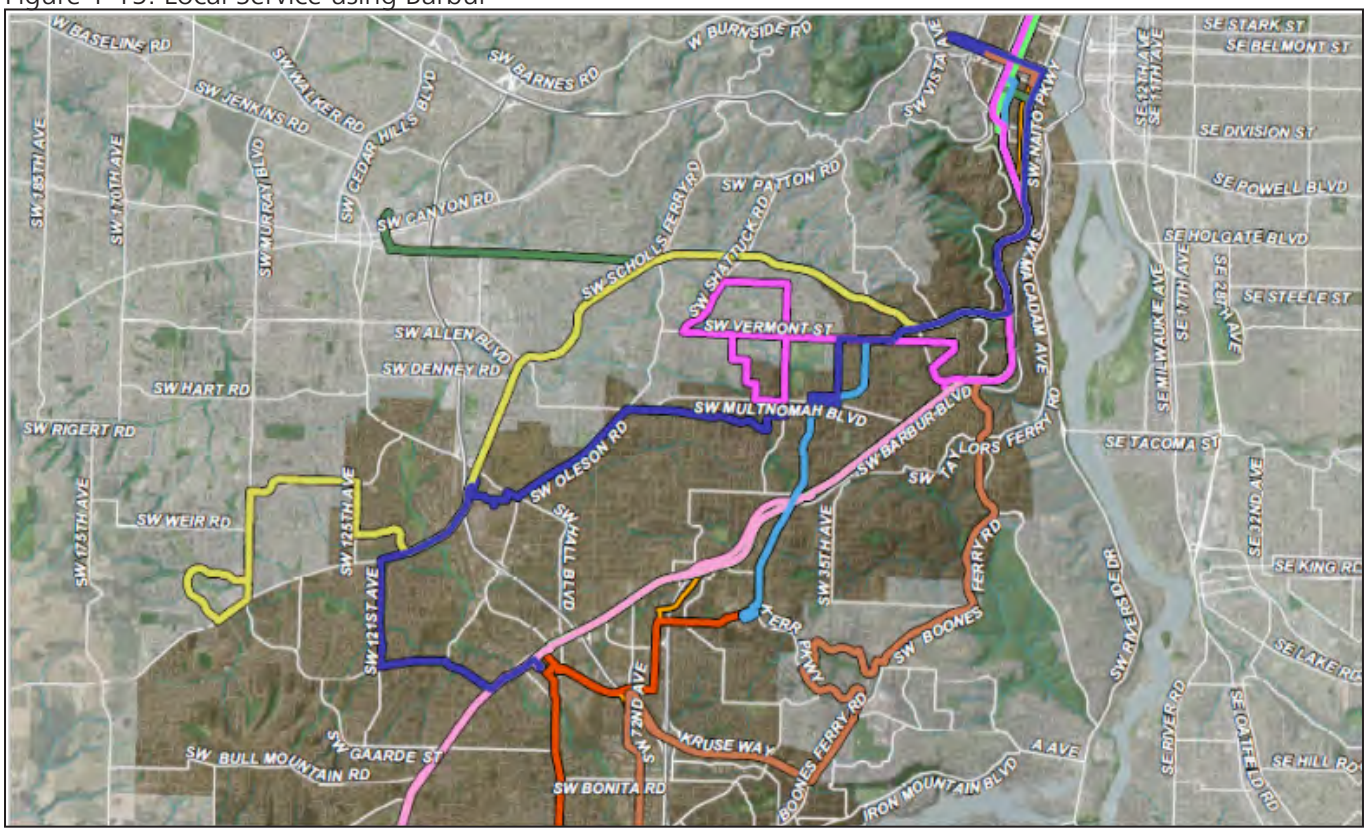
Corridor Service Reallocation

The topography in the northern section of the Southwest Corridor causes a funneling effect on bus service, with several corridor bus lines using Barbur Boulevard north of Capitol Highway (north) to enter or leave downtown Portland (figure 1-15). Today, these include lines 1, 12, 38, 44, 45, 54, 92, and 94, with up to 26 buses per hour in each direction in peak periods. In 2035, with service for trunk lines (the 12 and 94) adjusted to accommodate projected demand, the number of buses per hour would increase to at least 35 buses per hour in the No-Build.

Under the LRT alternative there would be an opportunity to reduce the number of buses in the northern part of the corridor and to redistribute service hours to transit to the southern part of the corridor. Because there would be capacity remaining on LRT after serving the projected peak demand, some local transit lines that would travel on Barbur could be interlined or shortened, with travelers destined to or from downtown Portland transferring to or from LRT. As a result, LRT operations would be more efficient as daily ridership would increase without additional operating cost, and bus service hours saved from interlining or shortening routes could be reallocated elsewhere in the corridor. Reallocation would provide new or enhanced connections between other communities in the corridor and surrounding areas in addition to connections to the LRT.

This opportunity would not exist under the BRT alternatives, as BRT capacity would not accommodate the projected demand without additional BRT service. Transit riders transferring to BRT from interlined or shortened local routes would require additional BRT service and result in higher BRT operating costs.

Figure 1-15. Local Service using Barbur



Capital Cost Magnitudes

ubject to available funding, in the next phase somewhat more detailed design (conceptual design) will be performed that will allow the development of more traditional cost estimates. The following cost magnitude estimates are in 2022 dollars.

The highest cost magnitude combination of alternatives and options is LRT to Tualatin with a tunnel to OHSU at $3.1-3.4 billion. LRT to Tualatin without a tunnel is estimated to cost $2.4-2.7 billion; LRT to Tigard without a tunnel is estimated at $1.7-1.8 billion.

The cost magnitude of BRT would vary with better performance coming with increasing investment in capital costs. The best performing BRT to Tigard is expected to cost approximately $630-690 million.

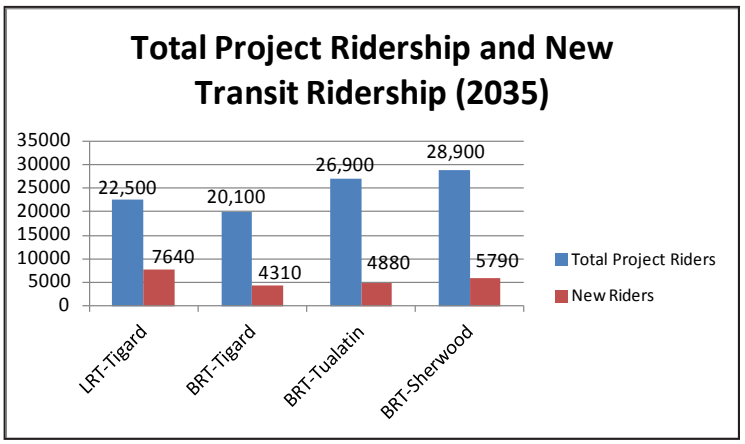
In general, an investment in capital costs reduces operating costs. In addition, federal matching funds are typically available on a competitive basis for capital costs, but are not available to assist with ongoing operations. Additional information on this trade-off will be developed during the next phase of the project.

Destination: Comparison of Tigard, Tualatin and Sherwood

Ridership

Compared to BRT terminating in Tigard, an extension to Tualatin would add 6,800 total project riders and 570 new transit riders (figure 1-16). An extension to Sherwood would add another 2,000 project riders and 910 new riders. The extension to Sherwood assumes Tualatin-Sherwood Road would be widened; the No-Build does not. This expansion would mean improved transit service for the BRT relative to the No-Build bus and results in a relatively higher number of new riders in this section compared to the number of new riders between Tigard and Tualatin.

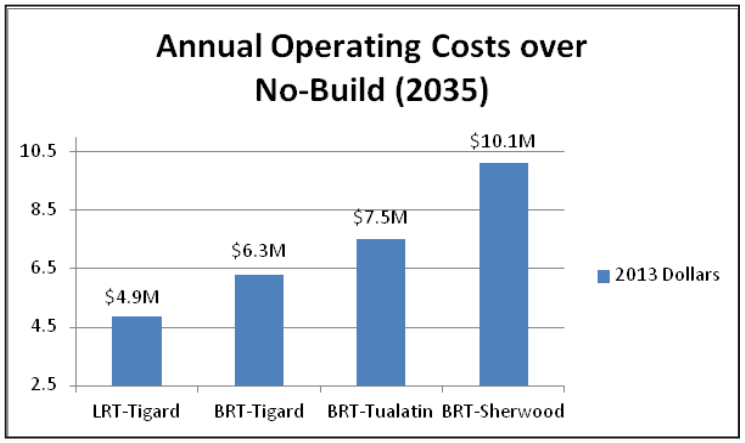
Figure 1-16. Ridership



Change in Annual Corridor Operating Costs

Compared to BRT terminating in Tigard, an extension to Tualatin would cost an additional $1.2 million annually to operate, and an extension to Sherwood would cost an additional $2.6 million (figure 1-17). The higher relative cost of extending to Sherwood, compared to extending to Tualatin, is partially due to the routing on SW 72nd Avenue, which results in slower travel times (and longer run times) than BRT to Tualatin's routing on Hall Boulevard. Another factor contributing to the higher corridor operating cost resulting from extending BRT service to Sherwood is that BRT service between Sherwood and Tualatin would be higher frequency than the assumed No-Build bus service it would replace resulting in lower operating cost savings compared to other segments where more frequent bus service would be replaced.

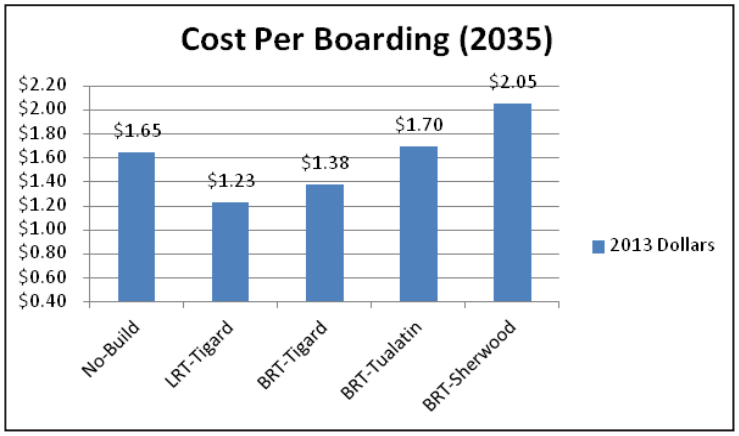
Figure 1-17. Annual Operating Cost over No-Build



Operating Efficiency

Compared to BRT to Tigard, cost per boarding would increase by $0.32 with an extension to Tualatin, and by an additional $0.35 with an extension to Sherwood (figure 1-18). As additional ridership would decline with longer routing, and as operating costs would increase, operating efficiency would decrease.

Figure 1-18. Cost per Boarding



Spokes

In the BRT Hub and Spoke alternative, spokes are local service bus routes that would utilize the BRT capital improvements on Barbur Boulevard to expedite travel between downtown Portland and the point where the local route would access the BRT investments. The three spokes assumed for analysis were:

- A southern spoke from Sherwood, traveling on OR-99W and accessing the BRT transitway north of Tigard
- An eastern spoke from Lake Oswego, serving PCC-Sylvania and accessing the BRT transitway at Crossroads
- A western spoke from Murray/Scholls, serving Washington Square entering the BRT transitway via SW Multnomah Boulevard.

Figure 1-19. Ridership

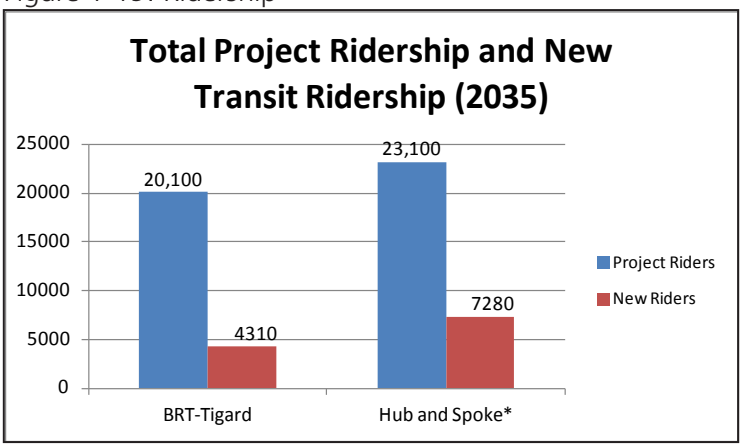
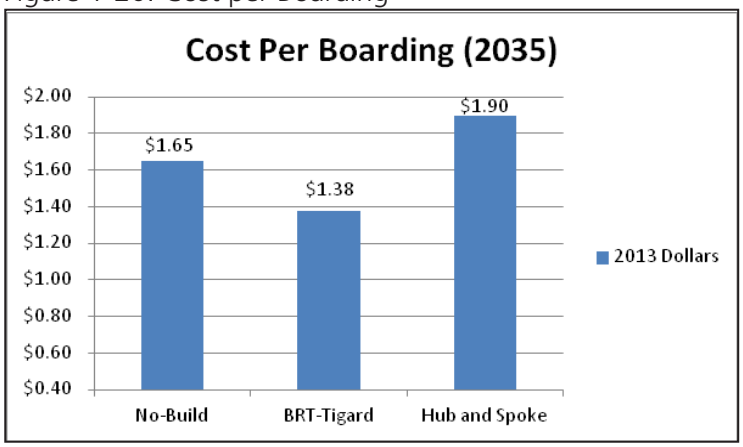


Figure 1-20. Cost per Boarding



Ridership

Spokes utilizing the BRT transitway would result in an increase of 3,000 daily total project riders, measured on the BRT transitway between Portland and Tigard, and an increase of 2,970 new system transit riders. Of the 23,100 project riders, 12,900 (56%) would use the three spokes, and 10,200 (44%) would use the BRT (figure 1-19).

Change in Annual Corridor Operating Costs

Compared to BRT to Tigard without spokes using BRT transitway, BRT with spokes would cost an additional $13.2M annually to operate, for a total of $19.5M over the No-Build.

Operating Efficiency

Compared to BRT to Tigard without spokes using the BRT transitway, the cost per boarding for the BRT and spokes on the transitway would increase by $0.52 (figure 1-20). While the additional service provided by the spokes on the transitway would attract increased ridership, the additional cost of operating 3 additional lines on Barbur (and duplicating service) would result in less efficient operations.

BRT Design Limitations

Routing local buses onto the BRT capital improvement would complicate center-running BRT lanes and create the need to either buy many more special buses with doors on both sides to operate on those spokes, which would increase capital costs, or build only right-side platforms on the transitway, which would increase costs and impacts. BRT improvements would most likely be limited to BAT lanes, signal priority/ preemption, and curbside queue bypass lanes at intersections. As a result, a high-level BRT with the highest ridership and land use and economic benefits would be difficult to attain.

Southwest Service Enhancement Plan

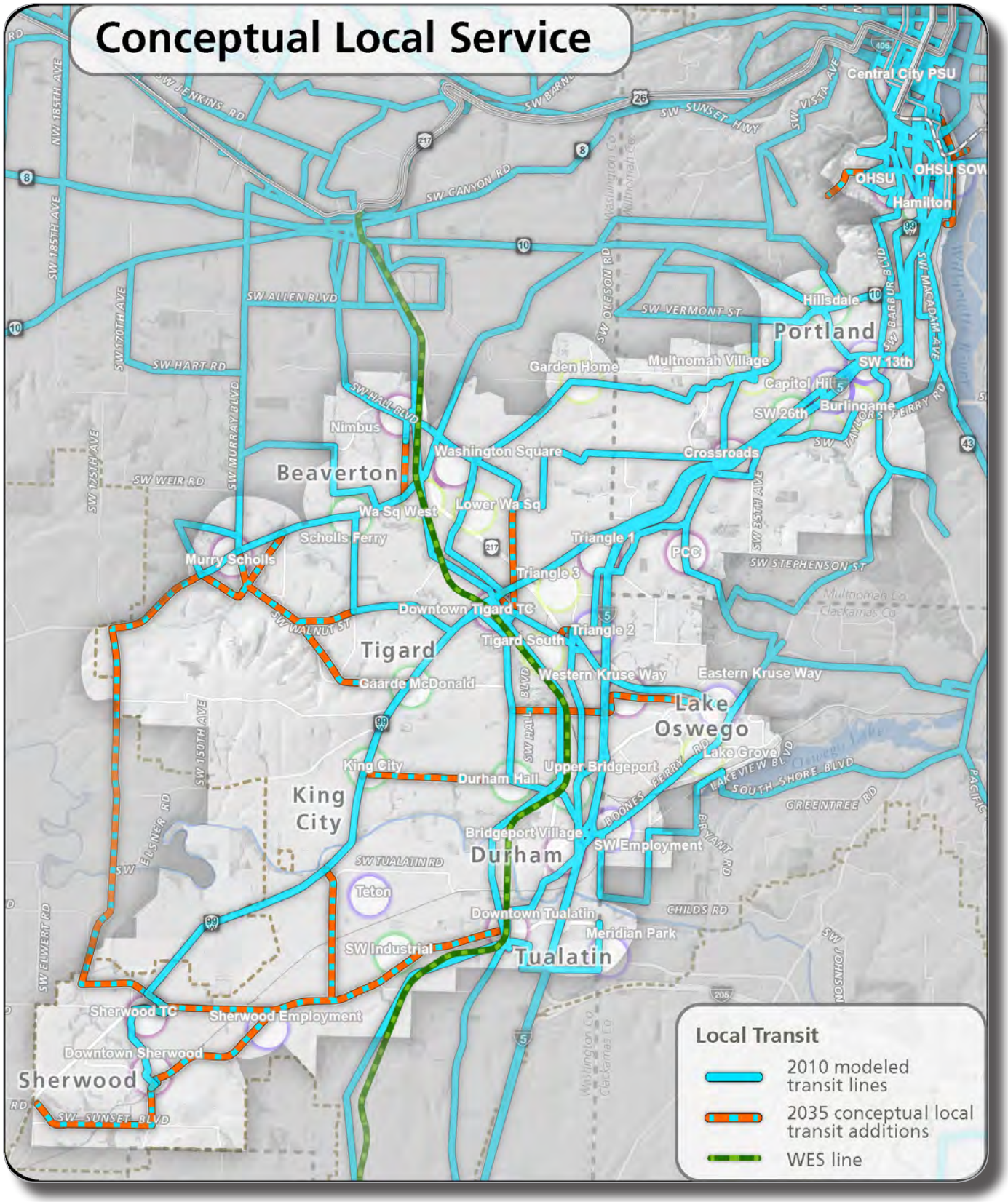
Southwest Service Enhancement Plan

TriMet is initiating its Southwest Service Enhancement Plan to identify future priorities for local service throughout the corridor. Initial concepts were developed in part through information learned during the SW Corridor Plan process, and are being tested in SW Corridor Plan modeling efforts. These improvements are included in modeling for the No-Build and all Build alternatives.

Preliminary concepts include new connections between the corridor and the other locations in Washington County, including between high employment areas in Hillsboro and both Sherwood and Tualatin, and new cross-corridor local service, such as on Tualatin-Sherwood Road, Gaarde/ McDonald Streets, Durham Road, and BonitaRd/ Kruse Way.

Through the Southwest Corridor Plan, TriMet will continue to work with corridor jurisdictions to develop the Southwest Service Enhancement Plan. As HCT alternatives become more defined, local transit connections to HCT and capital improvements necessary to enhance key transit connections throughout the corridor will be incorporated.

Figure 1-21. Modeled Transit Network



Environmental Evaluation

This evaluation is intended to provide a broad, high-level, planning analysis to identify the key environmental issues to be aware of in the corridor. This level of analysis differs from what would typically be conducted for specific alignments or transportation projects.

For this evaluation, locations where the transit alternatives that were developed for analysis intersect with key natural resources or land from publicly owned parks, recreation areas, wildlife and waterfowl refuges, and public or private historic sites that could trigger regulations within the corridor planning area were identified. Identifying these locations flags potential environmental issues that should be considered as the design alternatives are developed in subsequent phases, including the environmental impact statement and permitting phases.

This analysis is undertaken in order to begin to develop an understanding environmental issues and potential environmental impacts, as well as opportunities. Identifying environmental resources at this stage flags areas for potential opportunities to improve natural resources, as well as areas of focus for alignments that continue for further study. Information developed during this phase will continue to be refined and developed and shared with the public and with regulatory agencies during the upcoming phases in compliance with local, state, and federal requirements, including the National Environmental Policy Act, the U.S. Department of Transportation.

Methodology

A GIS analysis identified places where the HCT alignments analyzed intersect streams and land identified in the 2013 the Regional Conservation Strategy (RCS) in the corridor. The RCS is a science-based biodiversity guide for this region that incorporates high-resolution mapping and scientific modeling and information from practitioners who have expert knowledge of the region to identify "High Value Habitat" lands and "High Value Riparian" land. Figures 1-21 though 1-25 show the five HCT alignments with the RCS.

Wildlife corridors were evaluated by visually studying GIS data showing surrounding vegetation, natural resources and land uses where potential habitat corridors have been identified. The rating is qualitative based on best professional judgment and has not been field verified. The rating is relative, ranging from "very likely" to "likely" to "possible" to "unlikely" to have impacts. Those locations assigned a rating of "very likely", "likely" and "possible" should be closely followed through the planning process in order to identify both the potential impacts of development to key species as well as any opportunities present that could improve connections through design that considers and incorporates the needs of these species. For example, if a culvert is being added or replaced, better design could not only address the needs for fish passage but also associated terrestrial or other wildlife that are likely to be using the area.

Potential natural resource impacts

Areas with potential impacts to consider more closely have been identified. The alignment options with the greatest differences in routes might have different impacts on natural resources. Overlaying these alternatives on the 2013 the Regional Conservation Strategy land cover data flagged a few areas where close attention to environmental impacts should be considered as the alignment is refined.

Key areas for special attention in refining transit alignments include:

- In Central Portland, two transit alignment options were studied: one using SW Naito Parkway, and one using SW Barbur Blvd. The SW Barbur Blvd. may have more potential impacts on habitat areas – likely due to topography and mature tree canopy in that area.
- In the Hillsdale area, all the transit design options included using 99W. The GIS based analysis shows there is potential for impacts on habitat and water resources including Tryon Creek headwaters.

- Both the alignment that would serve PCC directly and the option for an alignment along Barbur show potential habitat impacts. An alignment that serves PCC directly, which at a minimum appears to intersect Red Rock Creek, a tributary of Fanno Creek, shows potentially fewer natural resource impacts than an alignment on Barbur Blvd.
- South of Tigard, an alignment that uses SW 72nd appears to have significantly fewer potential impacts than the Hall Boulevard option alignment.
- Both design options serving the southern end of the corridor (BRT Tualatin and BRT Sherwood) indicate potential impacts to water resources (floodplain and riparian areas) connected to the Tualatin River and to Hedges Creek.

Potential 4(f) resources

The Federal Highway Administration's (FHWA) 4(f) regulations govern the use of land from publicly owned parks, recreation areas, wildlife and waterfowl refuges, and public or private historic sites for Federal transportation projects. This analysis was undertaken in order to be aware of potential issues in the corridor.

The GIS analysis of potential 4(f) impacts of the HCT alternatives resulted in a list of approximately 40 parks within 150' of the transit alignments with potential 4(f) considerations. The analysis also included a preliminary look at publicly owned and accessible trails that are outside of parks. The analysis resulted in a list of approximately 50 trails with potential 4(f) considerations. The list of potential impacts is available in the Southwest Corridor Evaluation Report Technical Appendix available from Metro.

Figure 1-22. Environmental Evaluation: LRT to Tigard

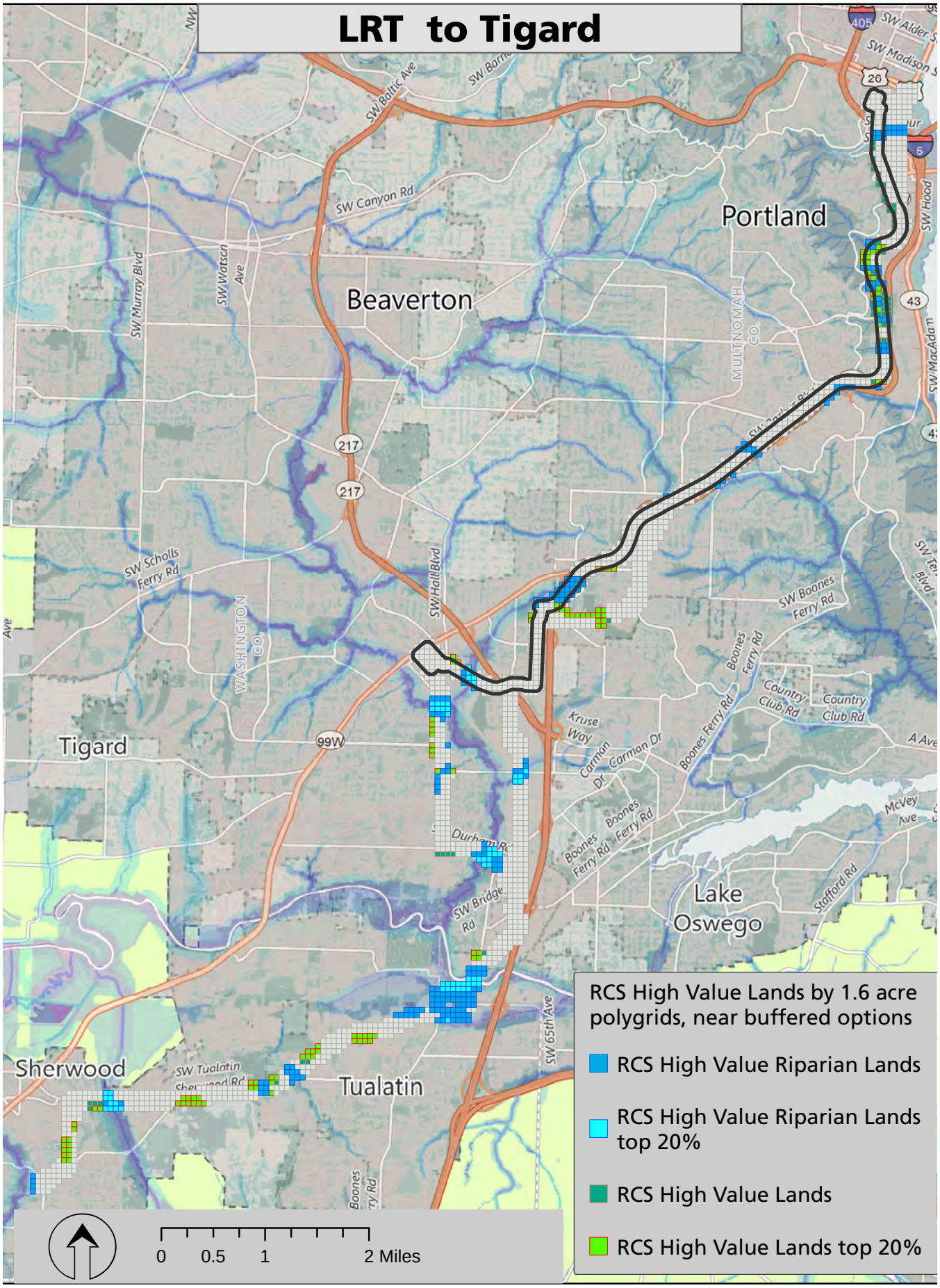


Figure 1-23. Environmental Evaluation: BRT to Tigard

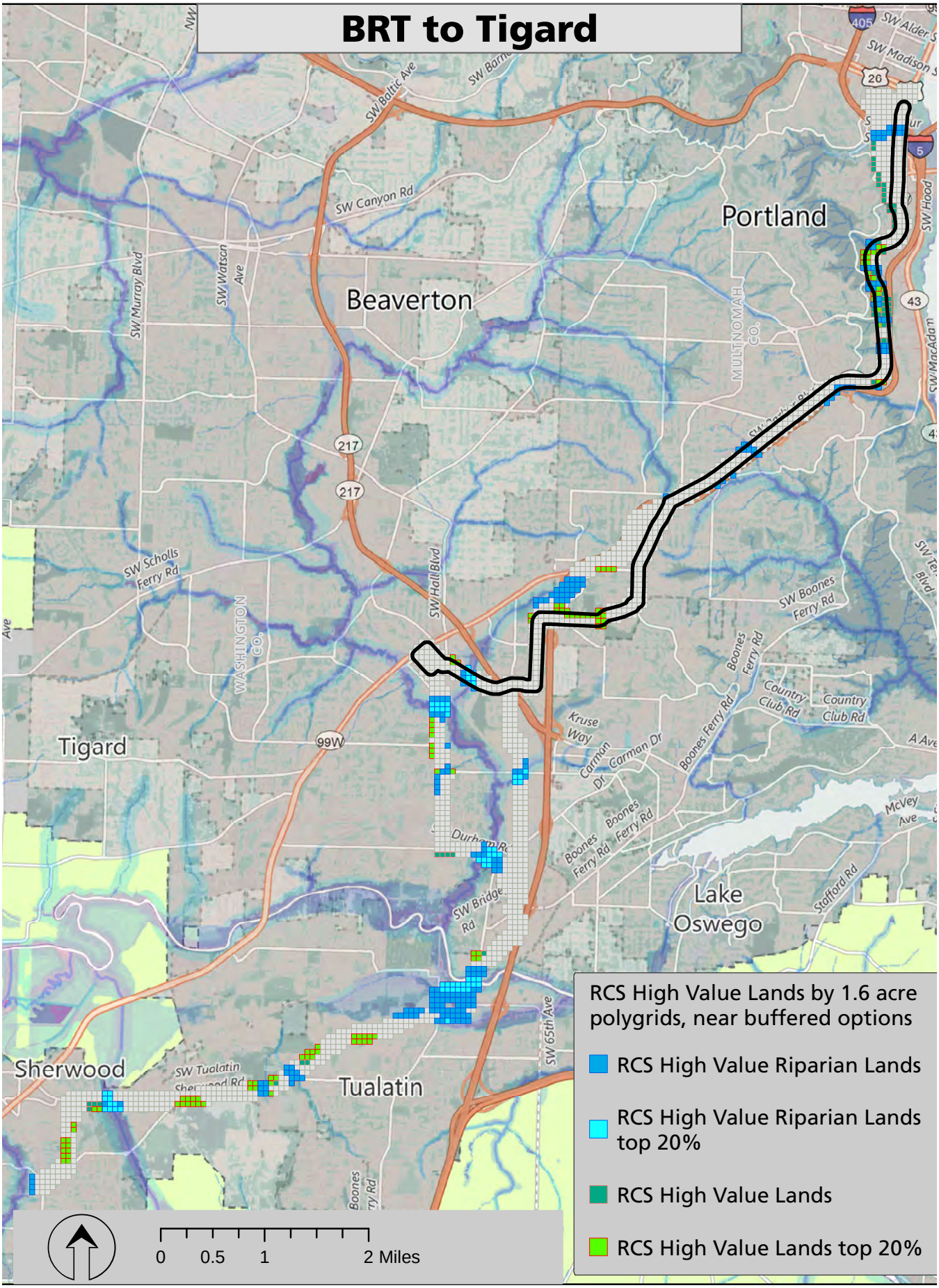


Figure 1-24. Environmental Evaluation: BRT to Tualatin

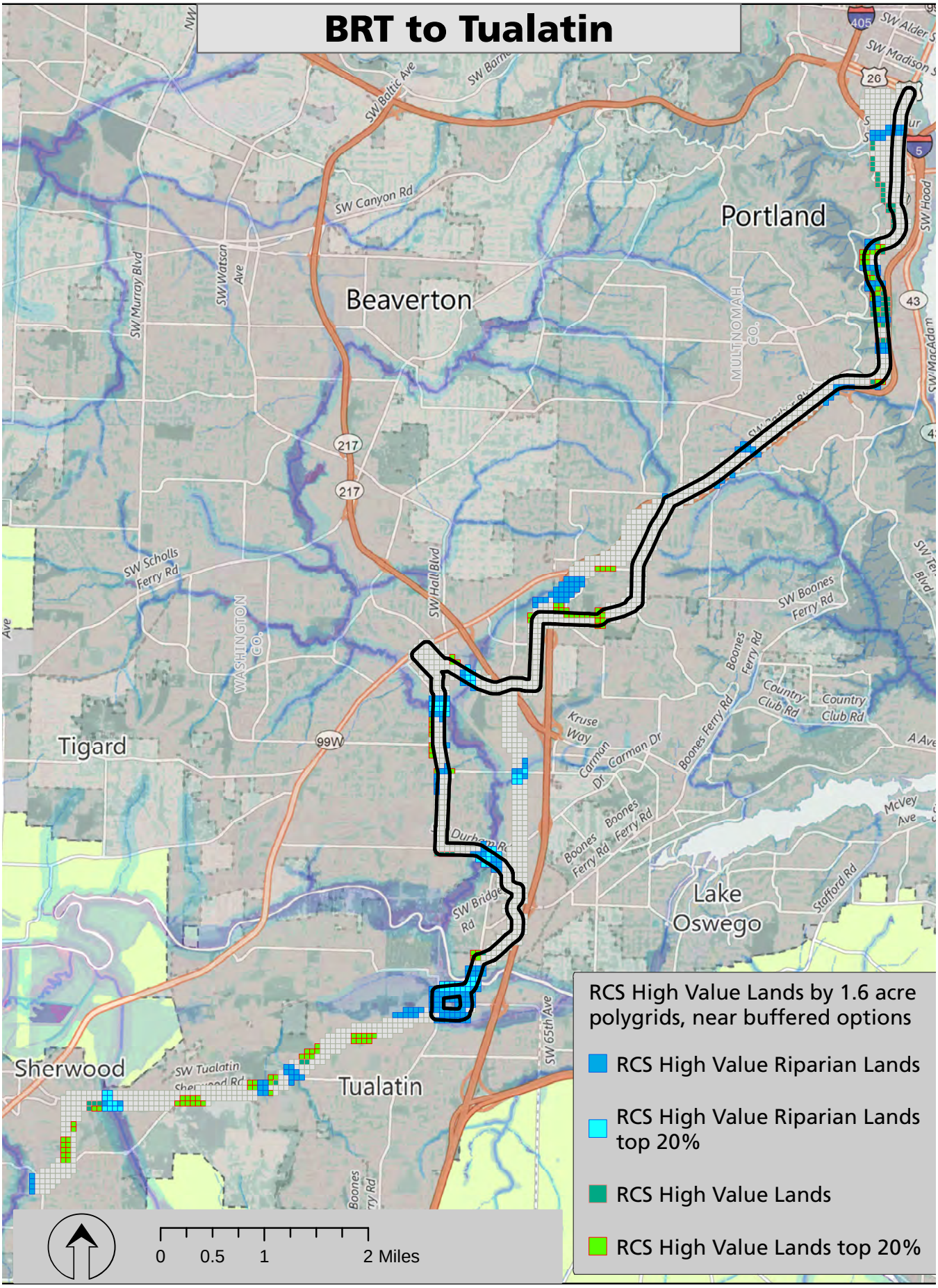


Figure 1-25. Environmental Evaluation: BRT to Sherwood

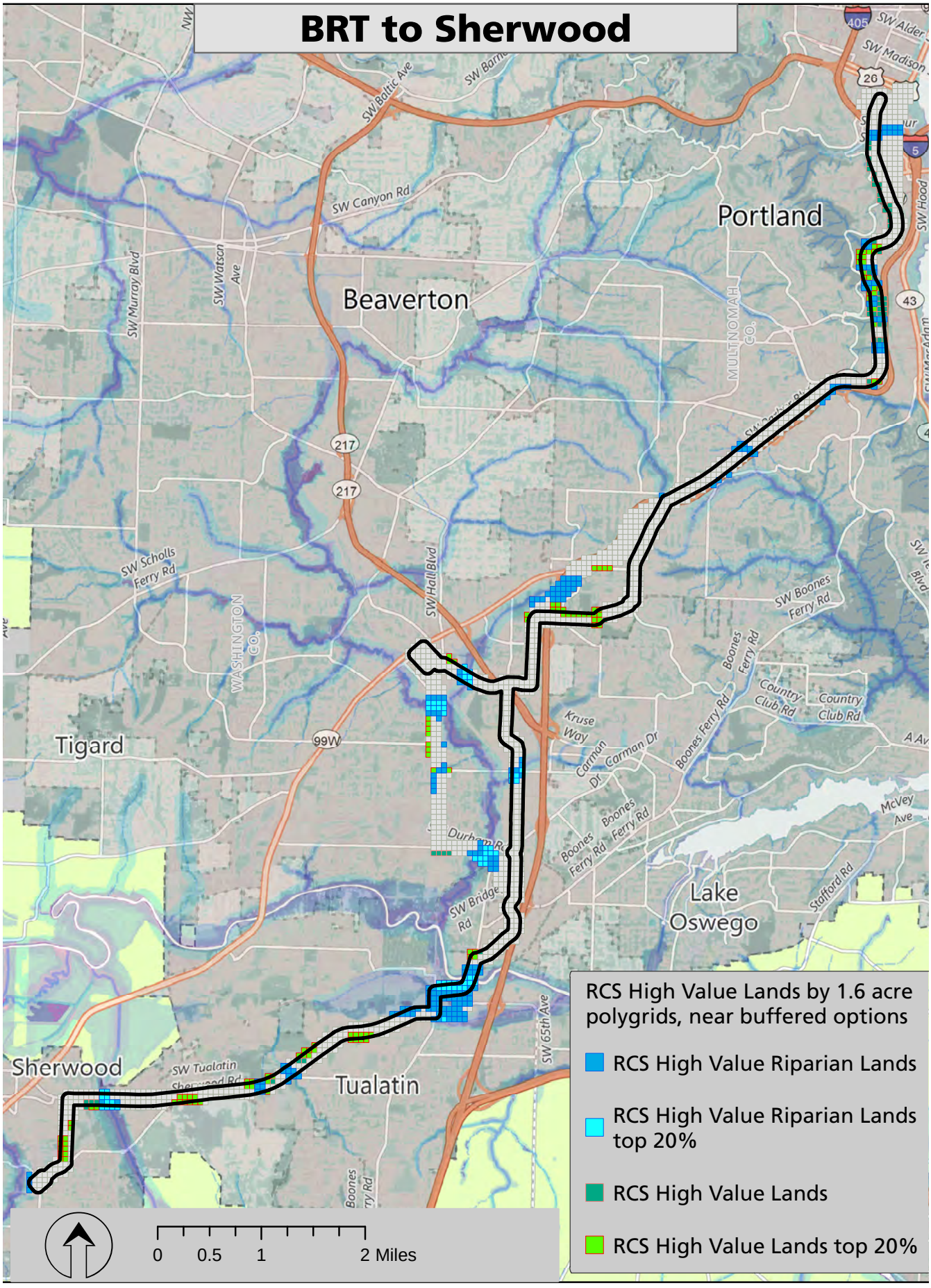
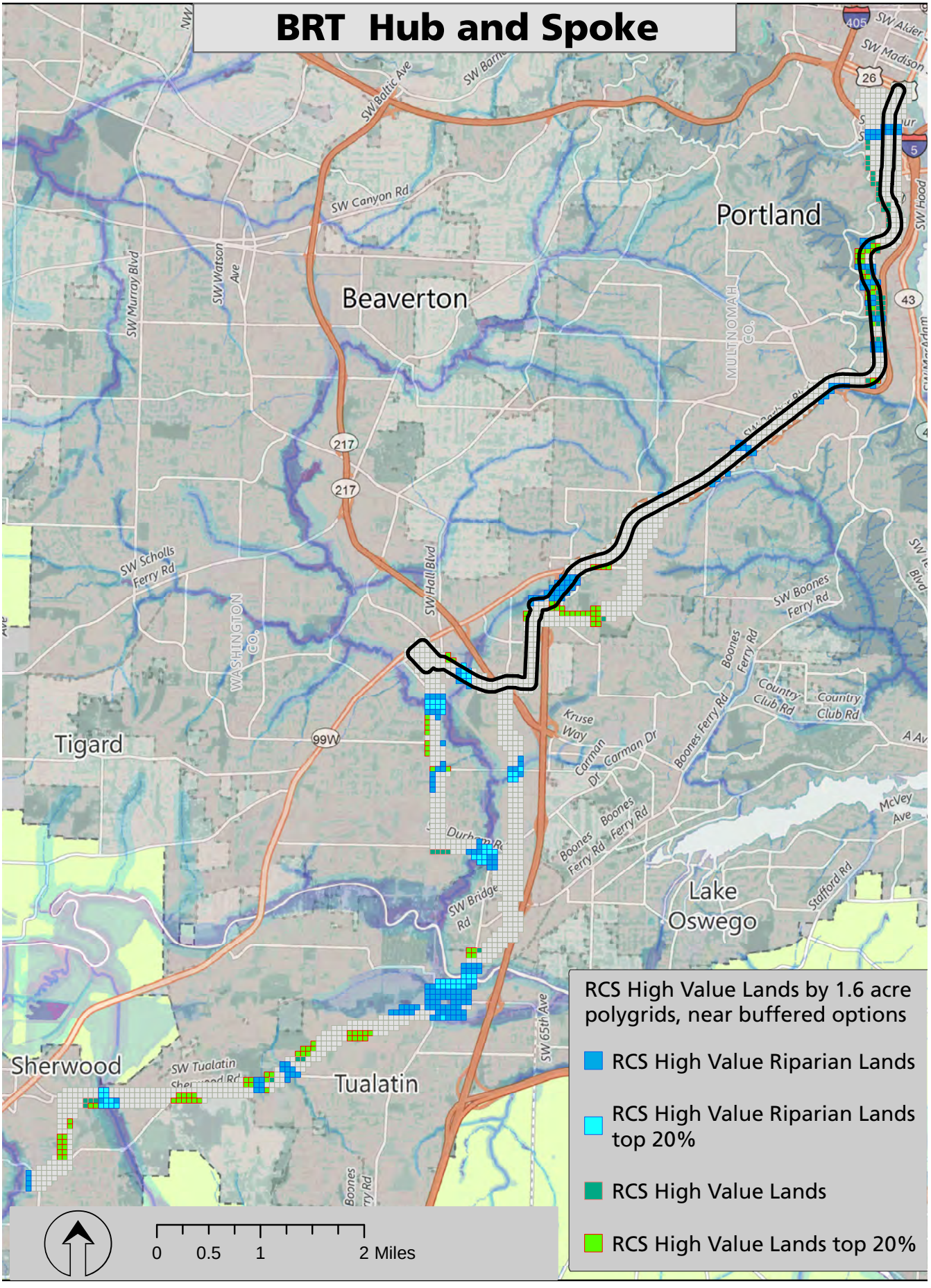


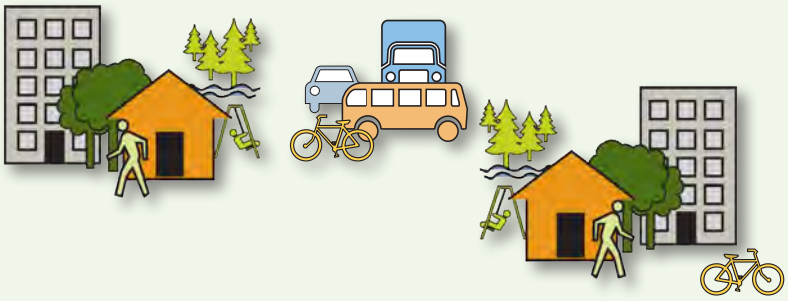
Figure 1-26. Environmental Evaluation: BRT Hub and Spoke

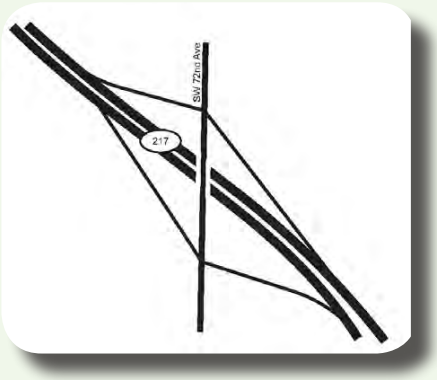


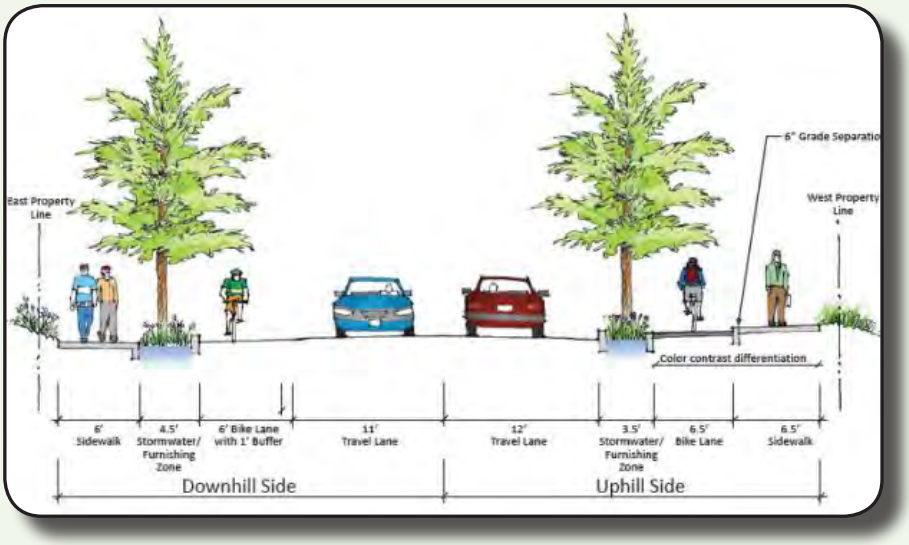
Roadway

The roadway projects evaluated in this report are a subset of the roadway projects that met the initial project screening for the Southwest Corridor Transportation Plan. The subset of projects described and evaluated in this report include those with:

- Traffic impacts that could be measured by the regional travel demand model
- Relatively high costs.







Introduction

Purpose

The purpose of the Southwest Corridor Plan evaluation process is to assist in and support identifying a preferred strategy for the corridor. The purpose of this report is to document the analysis of a subset of the roadway projects that met the initial project screening for the Southwest Corridor Transportation Plan. The subset of projects described and evaluated in this report include those with:

- Traffic impacts that could be measured by the regional travel demand model
- Relatively high costs.

This section focuses on roadway projects and the evaluation focuses on the transportation-related impacts of roadway projects.

Methodology

Evaluation framework

The analysis in this report is derived from the vision adopted by the SW Corridor Plan Steering Committee and the following goals and objectives:

Goal: Accountability and partnership – Manage resources responsibly, foster collaborative investments, implement strategies effectively and fairly, and reflect community support.

Objectives:

- Build upon existing plans, private development and investments in public infrastructure
- Make investments that maximize limited resources
- Equitably distribute the benefits and burdens of growth geographically and demographically

Measures used to evaluate the accountability and partnership goal and objectives include:

- Cost
- Support for transit investment

Goal: Prosperity – People can live, work, play and learn in thriving and economically vibrant communities where everyday needs are easily met.

Objectives:

- Develop communities that provide education, jobs, services, shopping and recreation
- Stimulate potential for private investment
- Support a wide variety of employment
- Improve opportunities for affordable living, considering the combined housing, transportation and utility costs

Goal: Health – An environment that supports the health of the community and ecosystems.

- Develop transportation facilities and urban form that enhance the natural environment
- Support active and healthy lifestyles
- Strive to enhance the natural environment to improve ecosystem function and air and water quality

Goal: Access and mobility – People have a safe, efficient and reliable network that enhances economic vitality and quality of life.

Objectives:

- Improve access to places where people live, work, play and learn
- Improve access, mobility and safety for all transportation modes, ages and physical abilities
- Improve the freight transportation system to ensure that the region and its businesses stay economically competitive.

Measures used to evaluate the access and mobility goal and objectives include:

- Travel time
- Vehicle hours of delay (VHD)
- Change in travel patterns
- Vehicles miles travelled (VMT)

Introduction

- Connectivity
- Pedestrian/Bicycle impacts

Bundles

The approach adopted for this evaluation was to combine the roadway and active transportation projects into "bundles" with each of the five high capacity transit projects. Table 2-1 on the following page shows which projects were included in each bundle. The affects of projects combined in the bundles, if any, on the model results are discussed in this report.

Costs

Capital costs are planning-level costs escalated to 2022, to represent year-of-expenditure dollars and maintain a consistent base of comparison. This report uses the planning-level estimates of projects from source documents, for example, the 2035 Regional Transportation Plan, a transportation system plan, or a corridor plan. If the source document did not include cost estimates, project staff used professional judgment to produce planning-level estimates.

Modeling

Metro's regional travel demand model was used to perform a planning-level assessment of major roadway projects. All modeling results reported are for the evening peak one hour, 5-6 PM. The model determines the changes in vehicle travel patterns and travel times expected to result from changes to the roadway network, providing a means of testing candidate roadway projects. The model is an estimate of future 2035 vehicle demand based on land use and roadway and transit network assumptions, and it provides a means for determining the relative changes in transportation performance. Performance measures such as roadway traffic volumes, vehicle delay, and changing travel times can be estimated for each project bundle, allowing the roadway impacts of each project to be estimated.

Narrowing

The evaluation of projects in this document focuses on transportation performance, however planning for the SW Corridor focuses on the desire for transportation investments to support the desired land use. The goals and objectives adopted for the plan provide the criteria for this narrowing. In addition to the transportation performance, a narrowing process provides an opportunity to evaluate projects against all the goals and objectives for the plan. A section on narrowing in this report explains the methodology and criteria used for narrow.

Table 2-1. Major Roadway Project Bundles for Modeling

Project #	Project Title	A: LRT Tigard	B: BRT Tigard	C: BRT Tualatin	D: BRT Sherwood	E: Hub & Spoke
1044	South Portland Circulation and Connectivity	X			X	
5013	Naito/South Portland Improvements				X	
1019 5006	Barbur Lane Diet			X	X	
4002 5005	Barbur Blvd. Multi-modal Improvements	X	X	X		X
1037	SW Portland I-5 Partial Split Spring Garden Interchange					X
5059	SW Portland/ Crossroads Multi-modal Project	X		X		
5009	Capitol Highway Improvements	X				
5004	Boones Ferry Road Improvements - Madrona to Kruse Way					X
1107	Highway 217 Over-crossing - Hunziger Hampton Connection	X	X	X	X	X
1121	Upper Boones Ferry at 72nd and Durham		X	X		
1149	Highway 217/72nd Ave. Interchange Improvements				X	
1134	Boones Ferry Road: Martinazzi to Lower Boones Ferry			X	X	X
1008B	I-5 Southbound Auxiliary lane: Lower Boones Ferry interchange		X	X		
1154	Tualatin-Sherwood Rd. Widening		X	X	X	X
1062	Arrow Street (Herman Road)		X	X		

South Portland Circulation and Connectivity (1044)

Project description

$28.4M (2022)

Restores the neighborhood grid and connectivity along Naito Parkway by restoring seven at-grade intersections from SW Sheridan to SW Grover St.

Adds new signalized intersections at SW Naito Parkway/Hooker and SW Kelly/Water.

Builds a new signalized intersection at SW Naito Parkway and Ross Island Bridge access that allows for removal of several existing roadways and ramp connections.

Adds a new ramp connection from SW Kelly (southbound) that passes beneath the Ross Island Bridge west of SW Hood Avenue.

Provides a revised southbound connection between US 26 and I-405 along Kelly Avenue.

Figure 2-1. South Portland Circulation and Connectivity Project and Modeling Influence Areas

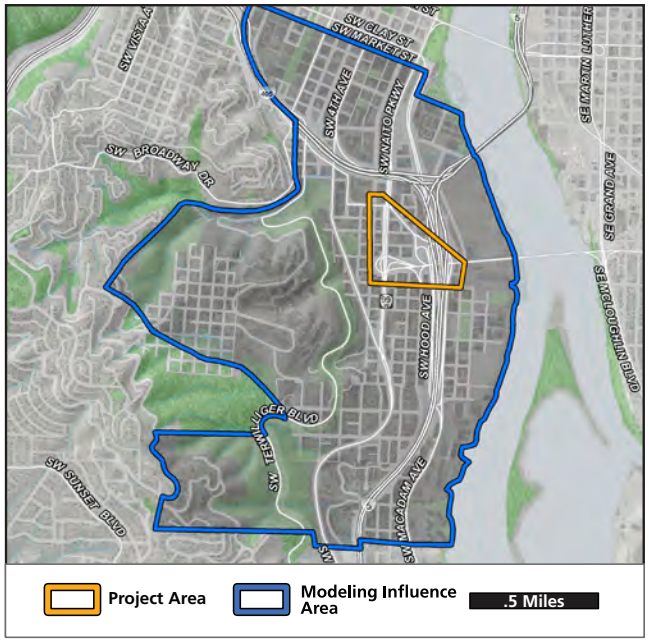


Figure 2-2. South Portland Circulation and Connectivity Project

Project purpose

- Enhance neighborhood connectivity across SW Naito Parkway.
- Improve connectivity, safety, and street environment for cyclists and pedestrians; shift through traffic from neighborhood streets onto Kelly Avenue.

Modeling assumptions

- Removes several existing ramp connections to and from the Ross Island Bridge
- Adds a new ramp connection from SW Kelly (southbound) to the Ross Island Bridge eastbound
- Maintains two lanes in each direction on SW Naito Parkway north of Ross Island Bridge
- Adds new signalized intersections along SW Naito Parkway at Ross Island Bridge and at SW Hooker Street
- Adds two signalized connections along Kelly Avenue north of the Ross Island Bridge off-ramp.

South Portland Circulation and Connectivity (1044)

Evaluation results

Summary

The project performs consistently with its purpose of redirecting the Ross Island Bridge traffic along Kelly Avenue. Some redirection of auto traffic from Naito to Kelly occurs, although a substantial amount remains on Naito. Overall vehicle delay increases as the system capacity is reduced.

Change in travel patterns

- This project converts the ramps between the Ross Island Bridge and Naito into an at-grade intersection, and increases the use of Kelly to access the bridge.
- Traffic from the west on US 26 (Arthur) continues on Kelly rather than turning south onto Naito to access the bridge. As a result, traffic on Kelly increases 7% while traffic on Naito Parkway south of Arthur/Kelly drops by 15%-25%.
- Traffic on the bridge drops 3% due to the revised access.
- Freeway travel patterns do not measurably change.

Route travel time

- During the PM peak hour, the average auto travel time between I-405 and the Ross Island Bridge increases by about 5 seconds northbound and 20 seconds southbound.

Area-wide delay

- This project increases vehicle hours of delay (VHD) in the influence area by 4%. Most of the additional delay is for vehicles accessing the Ross Island Bridge from the west.
- This project reduces vehicle miles traveled (VMT) in the influence area by 2%.

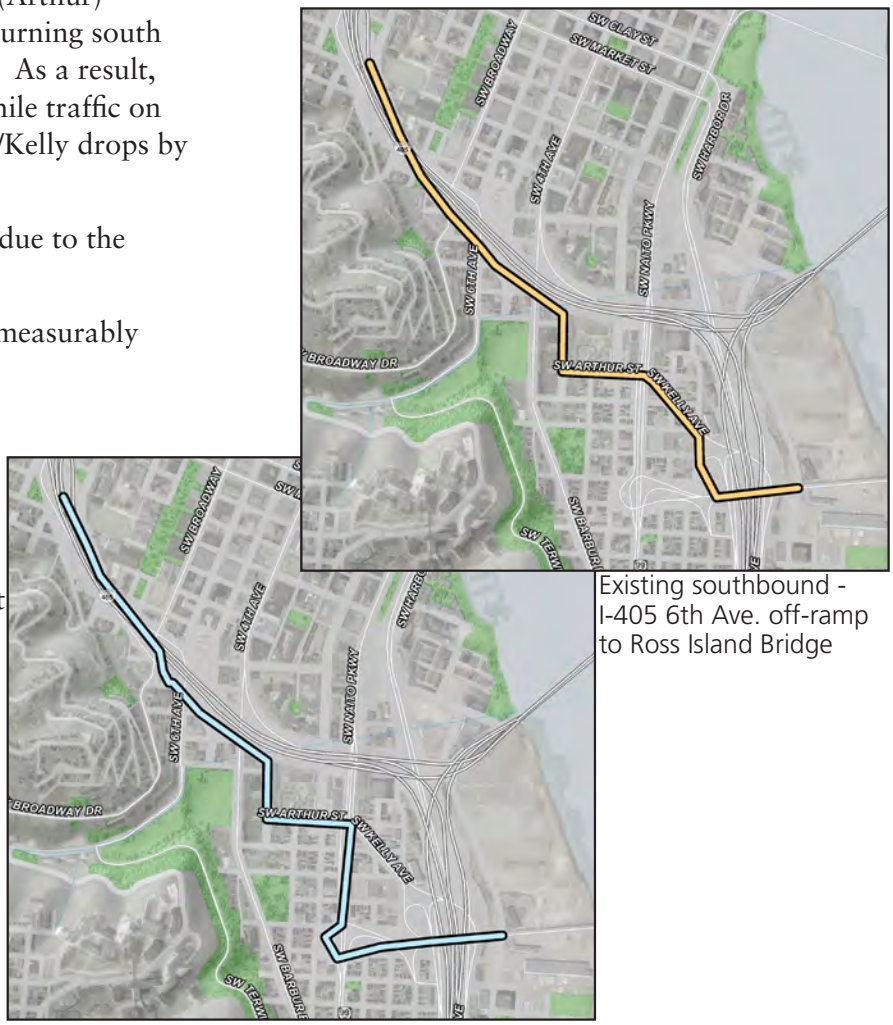
Connectivity

These projects (5013 and 1044) increase connectivity in a neighborhood with a fragmented street grid.

Bike/Pedestrian

This project improves walking and bicycling conditions in the neighborhood by restoring street connectivity across Naito Parkway.

Figure 2-3. South Portland Circulation and Connectivity Travel Time Routes



Existing southbound - I-405 6th Ave. off-ramp to Ross Island Bridge

Exisiting northbound - Ross Island Bridge to 12th Ave. I-405 off-ramp

Naito/South Portland Improvements (5013)

Project description

$51.2M (2022)

Reconstructs Naito Parkway as a two-lane neighborhood collector street with bike lanes, sidewalks, left turn pockets and on-street parking.

Removes grade separations along Naito at Barbur, the Ross Island Bridge, Arthur/ Kelly, and the Gibbs pedestrian bridge.

Restores the neighborhood grid along Naito Parkway by restoring 17 at-grade intersections from SW Sheridan to SW Lowell St.

Reconfigures Naito Parkway and Kelly Avenue as an at-grade signalized intersection.

Reconfigures and realigns Naito Parkway and Barbur Blvd. as an at-grade signalized intersection.

Figure 2-5. Naito/ South Portland Improvements Project

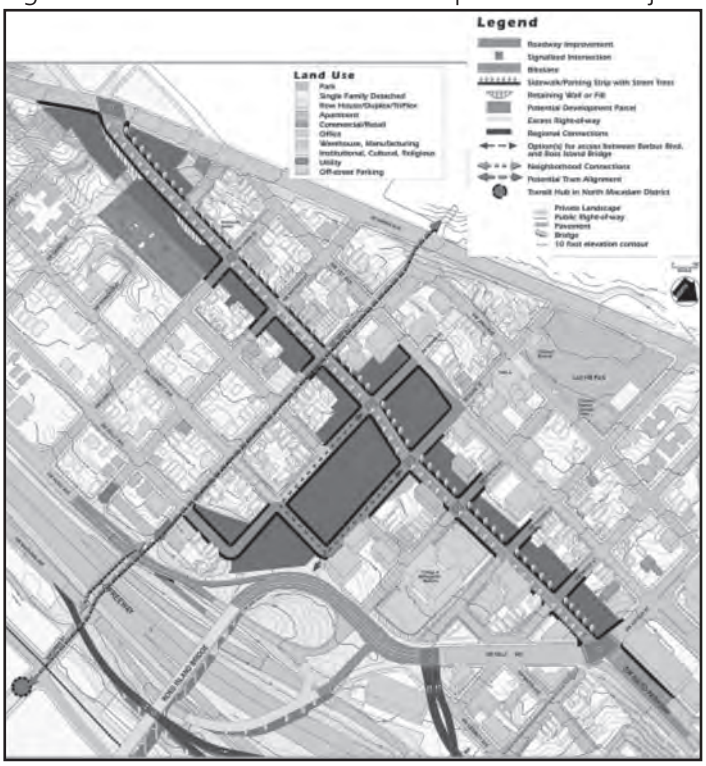
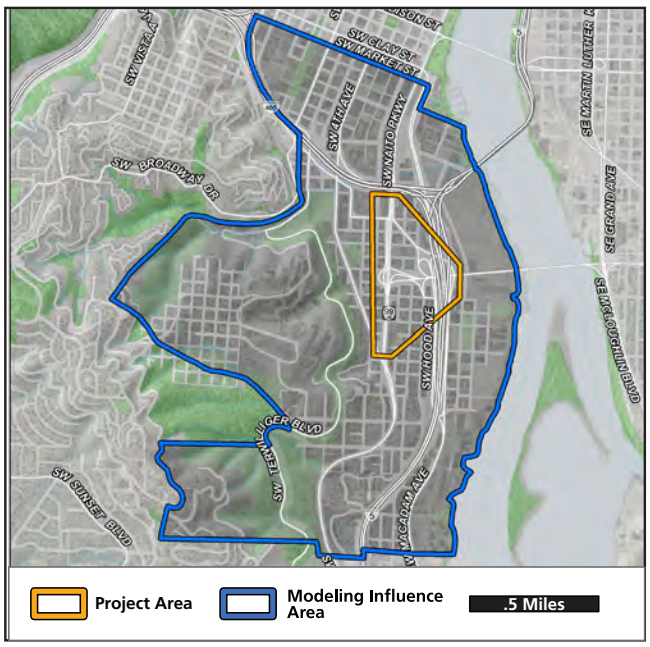


Figure 2-4. Naito/ South Portland Improvements Project and Modeling Influence Areas



Project purpose

Improve connectivity and create a multimodal neighborhood street character on Naito Parkway

Modeling assumptions

- Reduces vehicle capacity on SW Naito Parkway to one lane in each direction with turn lanes.
- Adds signalized intersections on Naito Parkway at Kelly Avenue and at Barbur Blvd.
- Removes existing ramp connections between Ross Island Bridge and Naito Parkway.
- For modeling this project does not stand alone in any bundle. This project is in the BRT to Sherwood run with the South Portland Circulation project (1044)

Evaluation results

Summary

The project performs consistently with its purpose of converting Naito to a neighborhood-scale street, and redirecting the Ross Island Bridge traffic along Kelly Avenue. About half of Naito's auto traffic is diverted to other streets, especially Kelly and Barbur. Overall vehicle delay increases as the system capacity is reduced.

Change in travel patterns

- This project, in conjunction with South Portland Circulation and Connectivity (1044), reconstructs Naito Parkway as a neighborhood collector type street, and removes grade separations at Arthur/Kelly and Barbur. The result is reduced vehicle demand on Naito Parkway.
- Traffic accessing the bridge from the west and north is primarily directed along Kelly. As a result, traffic on Kelly increases 23% while traffic on Naito south of Arthur/Kelly drops by 45%-60%.
- Traffic on Barbur (parallel to Naito) increases by 22% as through traffic diverts from Naito to Barbur, which has available capacity.
- Traffic on the bridge drops 5% due to the revised travel patterns.
- Freeway travel patterns do not measurably change.

Area-wide delay

- In conjunction with South Portland Circulation and Connectivity (1044), this project increases VHD in the influence area by 7%. Most of the additional delay is for vehicles accessing the Ross Island Bridge from the west.

Connectivity

- These projects (5013 and 1044) increase connectivity in a fragmented neighborhood by converting a 1940s-era expressway into a neighborhood-scale street with crossings.

Bike/Pedestrian

- These projects add and improve sidewalks to fill gaps, add pedestrian crossings, add transit amenities, and add or improve bike lanes to fill gaps.

Barbur Boulevard Road Diet (5006, 1019)

Capitol to Hamilton (1019)

Project description

$ $0.3M (2022)

Reduces the number of northbound lanes on Barbur from three to two from Capitol Highway (north) to 1/4 mile south of Hamilton.

Adds buffered bike lanes.

Terwilliger to Capitol Highway (5006)

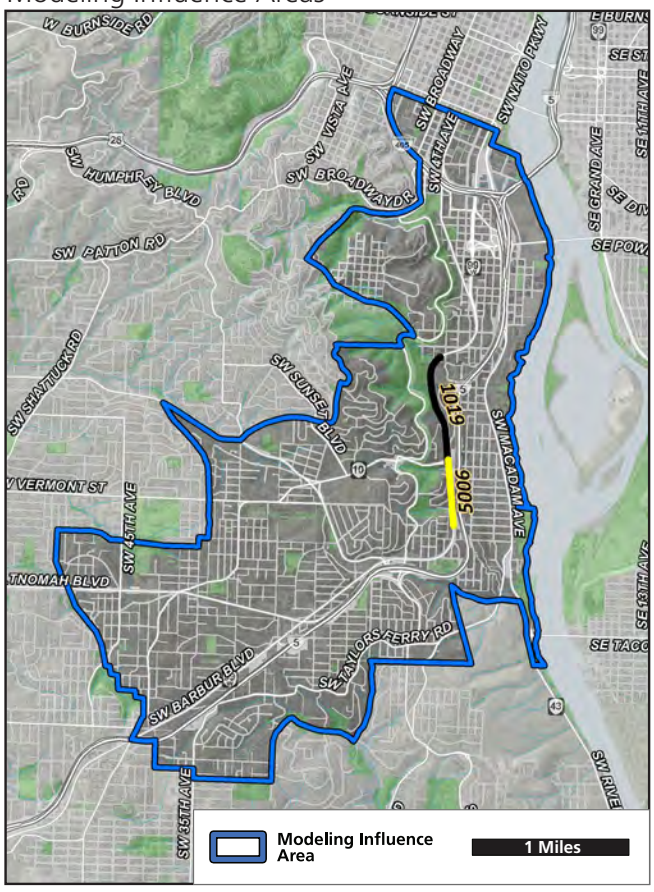
Project description

$ $0.3M (2022)

Reduces number of northbound lanes on Barbur from two to one from SW Miles Street to Capitol Highway.

Adds bike lanes and widens sidewalks over Newberry and Vermont bridges.

Figure 2-6. Barbur Boulevard Road Diet Project and Modeling Influence Areas



Project purpose

Reduce vehicle speeds, improve cyclist and pedestrian safety, and close a major bicycle route gap. Intended to reduce speeds and improve safety and improve pedestrian/bike crossing safety.

Modeling assumptions (5006, 1019)

- Reduces northbound lanes and capacity on Barbur Blvd. from Terwilliger to Hamilton Street.

Evaluation results

Summary

The proposed road diet projects remove a northbound vehicle travel lane on Barbur in order to provide better bicycle facilities. Since the lane removal occurs in an uninterrupted (no signals) section of Barbur with all lanes retained at traffic signals, the effect on through capacity is minimized. However, to better understand possible effects of the road diet project on travel times and diversion, Metro analyzed the project according to two different models: 1) Dynamic Traffic Assignment (a relatively new analytic model), and 2) Synchro/SimTraffic, a micro-simulation model.

Results differed significantly between the two analytical models, indicating that more analysis is needed before conclusions can be drawn about changes in travel time or travel patterns. Analysis of the potential HCT options during Refinement will provide more detailed about specific roadway impacts.

Preliminary results from the DTA and Synchro/SimTraffic models, while not conclusive, do provide planning-level information in several areas, including bicycle and pedestrian comfort, motor vehicle travel time, and possible changes in travel patterns.

In order to advance the road diet for further consideration, project partners may decide that additional analysis is needed about the benefits and impacts of the project.

Barbur Boulevard Road Diet (5006, 1019)

Change in travel patterns

- Based on the analysis to date, no firm conclusions can be drawn about the amount of diversion resulting from possible additional delay due to the road diet. Additional analysis would be needed, such as VISUM/VISSIM , to ensure an accurate estimate of diversion.
- Any diversion that does occur would most likely divert to parallel surface roads, including Corbett, Macadam, Terwilliger, and Taylors Ferry. Diversion to I-5 is not expected to be significant due to existing congestion levels.

Route travel time

- Based on Synchro/SimTraffic analysis, the average northbound AM peak hour travel time would increase by 20 - 25 seconds, or 7%, along Barbur from Terwilliger Blvd to Hamilton Street in year 2011 conditions due to reduced progression speeds between SW 3rd Avenue and Capitol Highway.
- Based on the DTA model, the average northbound travel time would increase by 1 – 2 minutes along Barbur in year 2011 conditions.
- Based on Synchro/SimTraffic analysis, the average northbound AM peak hour travel time would increase by 40 - 45 seconds, or 10%, along Barbur from Terwilliger Blvd to Hamilton Street in 2035 due to reduced progression speeds between SW 3rd Avenue and Capitol Highway.
- Based on the DTA model, the average northbound travel time would increase by 7 – 10 minutes along Barbur in 2035.

The difference between these two model results may be explained by the fact that this DTA model run used a lane capacity 46% lower than standard Highway Capacity Manual practices, and used reversed PM peak volumes as an estimate, rather than actual AM peak volumes. The result is that existing congestion may be overestimated in the DTA model.

Bike/Pedestrian

- The removal of a travel lane provides space for improved bicycle facilities improving the comfort of people bicycling.

Figure 2-7. Barbur Blvd. Road Diet Travel Time Route

Barbur - Bertha to between Whitaker and Curry

Barbur Boulevard Multimodal Improvements (4002, 5005)

SW 3rd to Terwilliger (4002)

Project description

$8.5M (2022)

Make improvements for pedestrians and transit riders, including filling sidewalk gaps and making crossing improvements.

Provide transit and roadway improvements including preferential signals, pullouts, shelters, left turn lanes and sidewalks.

Fill bike lane gaps.

Terwilliger to city limits (5005)

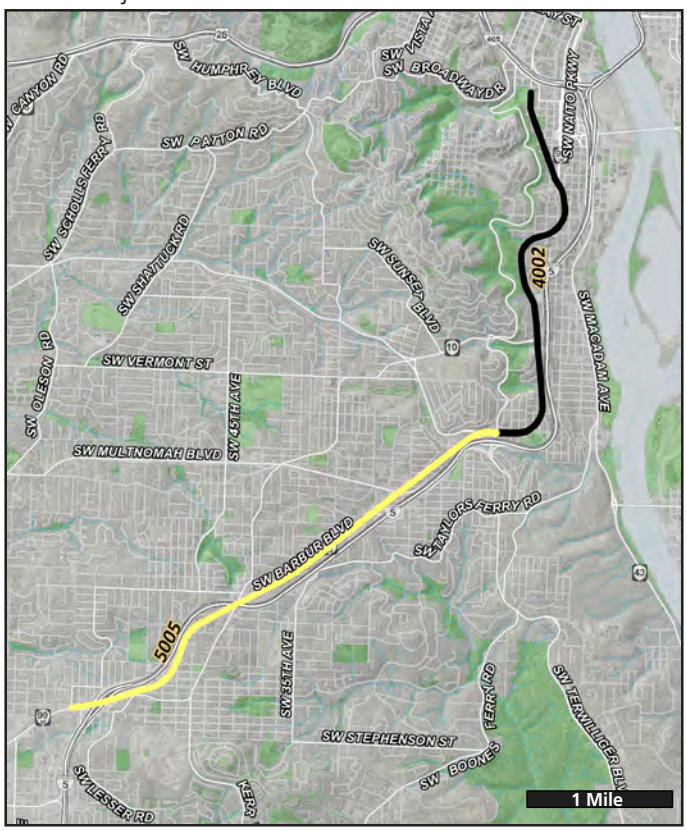
Project description

$32M (2022)

Complete boulevard design improvements including adding sidewalks and street trees, filling bike gaps and creating safe pedestrian crossings.

Enhance transit access and stop locations, and bike lanes from Terwilliger Blvd. to 64th Ave.

Figure 2-8. Barbur Boulevard Multimodal Improvements Project Area



Project purpose

Improve safety, connectivity, and comfort for transit users, cyclists, and pedestrians

Modeling assumptions (5006, 1019)

- Reduce northbound lanes and capacity on Barbur Blvd. from Terwilliger to Hamilton Street.
- Convert northbound lane to bus only; southbound buses are in mixed traffic.

Evaluation results

Bike/Pedestrian

These projects add and improve sidewalks to fill gaps, add pedestrian crossings, add transit amenities, and add or improve bike lanes to fill gaps.

Figure 2-9. Barbur Boulevard Multimodal Improvements

CIVIC CORRIDORS

A civic corridors approach to Barbur Boulevard would tie together Barbur's transportation modes, increase greenspace and incorporate new urban design prototypes.

SW Portland I-5 Partial Split Spring Garden Interchange (1037)

Project description

$103.1 M (2022)

Reconfigures the I-5 Spring Garden interchange as a partial split.

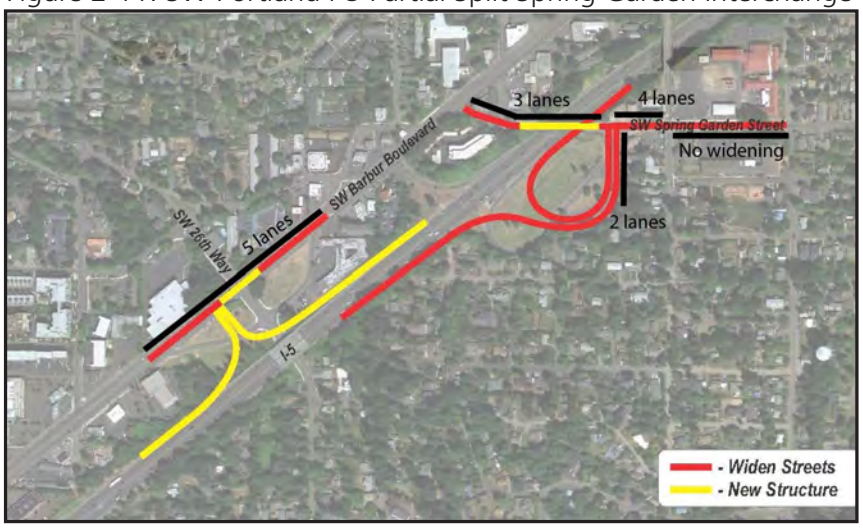
Creates new I-5 southbound on- and off-ramps to and from Barbur Blvd. just south of SW 26th.

Creates new I-5 northbound on- and off-ramps at Spring Garden Street.

Closes existing southbound off-ramps at Spring Garden and northbound off-ramp at Taylor's Ferry.

Rebuilds structure over I-5 on Spring Garden Street and widens Spring Garden east of Barbur Blvd.

Figure 2-11. SW Portland I-5 Partial Split Spring Garden Interchange



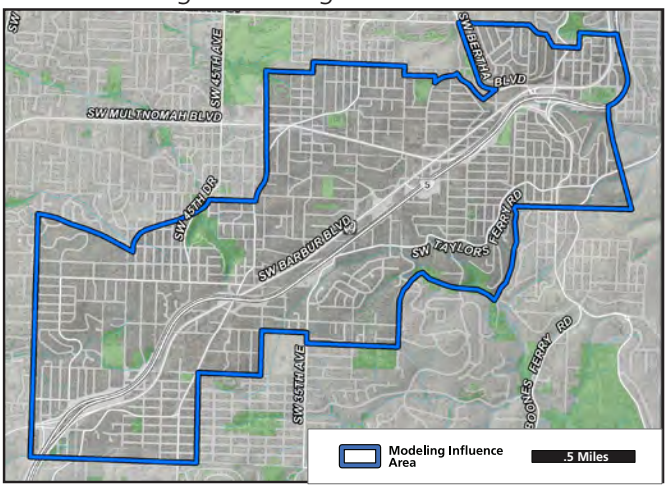
Project purpose

Create additional access to I-5 southbound; reduce use of Barbur for longer, higher-speed southbound trips; reduce vehicle demand at the Crossroads intersection.

Modeling assumptions

- Adds I-5 southbound on- and off-ramps to and from Barbur Blvd just south of SW 26th
- Adds I-5 northbound off-ramp at Spring Garden Street

Figure 2-10. SW Portland I-5 Partial Split Spring Garden Interchange Modeling Influence Area



- Removes existing I-5 northbound off-ramp to Taylor's Ferry Road
- Removes existing I-5 southbound off-ramps at Spring Garden
- Adds capacity to Spring Garden Street between Barbur Blvd. and SW 19th Ave.

Evaluation results

Summary

The project shifts a substantial amount of traffic from Barbur to I-5 between the new interchange and 65th/Hwy 99-W. Traffic volumes decrease on Taylors Ferry, where the existing off-ramp is removed. System delay increases as additional traffic is attracted to a constrained segment of I-5.

Change in travel patterns

- This project shifts traffic away from Barbur Blvd. to I-5 on the nearby portions of these regional facilities. In the future Barbur Blvd. has very little congestion between Terwilliger and Taylors Ferry Road.
- I-5 northbound, north of Taylors Ferry Road increases by 8% or 440 vehicles/hour, and by 12% or about 600 vehicles/hour southbound (south of the Barbur on-ramp).

SW Portland I-5 Partial Split Spring Garden Interchange (1037)

- Barbur Blvd. southbound, between SW 30th and Taylors Ferry Road, drops by 20% or 340-350 vehicles/hour, and drops by 12% or 160 vehicles /hour northbound.
- Removing the I-5 off-ramp to Taylors Ferry Road reduces volumes on Taylors Ferry by about 78 % or 290 vehicles/hour eastbound and 42% or 110 vehicles/hour westbound.
- Westbound on Huber Street east of Capitol traffic volume increases by about 45% or 150 vehicles/hour.
- Westbound on Spring Garden east of Barbur Blvd. volumes increase by about 150 vehicles per hour (10%).

Route travel time

- The average northbound and southbound peak hour travel time is increased by 16-17 seconds or about 4.5% along I-5 from the Barbur Blvd. on-ramp (near SW 60th) to the Terwilliger Blvd. on-ramp.
- The average northbound and southbound peak hour travel time is increased by 8-11 seconds or about 2% along Highway 99W from SW 65th Avenue to just north of Terwilliger Blvd.

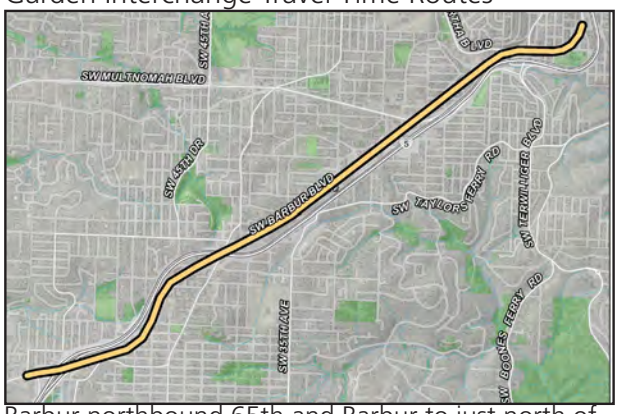
Area-wide delay

- This project, modeled with BRT Hub and Spoke (to Tigard) which adds Business Access Transit (BAT) lanes southbound on Barbur Blvd., increases VHD by about 19 hours or 15.5% in the influence area.
- VMT is virtually the same in the influence area.

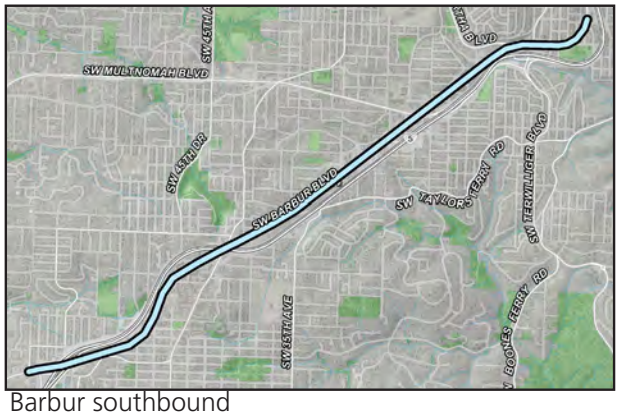
Bike/Pedestrian

- The freeway ramp locations would be expected to present challenges for pedestrians to cross.
- Minor street improvements on Spring Garden Street east of Barbur Boulevard would fill sidewalk gaps.

Figure 2-12. SW Portland I-5 Partial Split Spring Garden Interchange Travel Time Routes

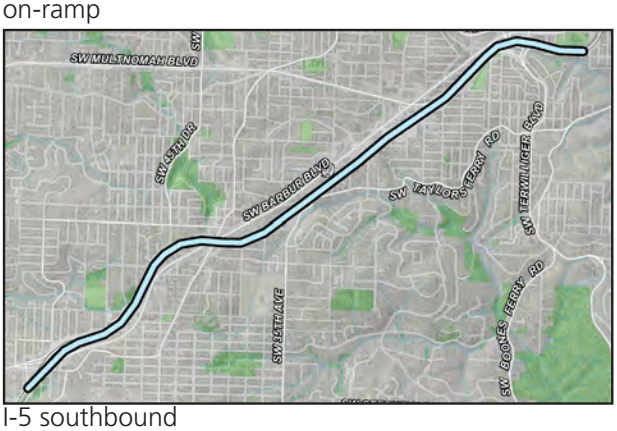


Barbur northbound 65th and Barbur to just north of Terwilliger



Barbur southbound

I-5 northbound from Barbur off-ramp to Terwilliger on-ramp



I-5 southbound

SW Portland/Crossroads Multimodal Project (5059)

Project description

$51.6 M (2022)

Modifies Barbur Blvd., Capitol Highway, and the I-5 southbound on-ramp.

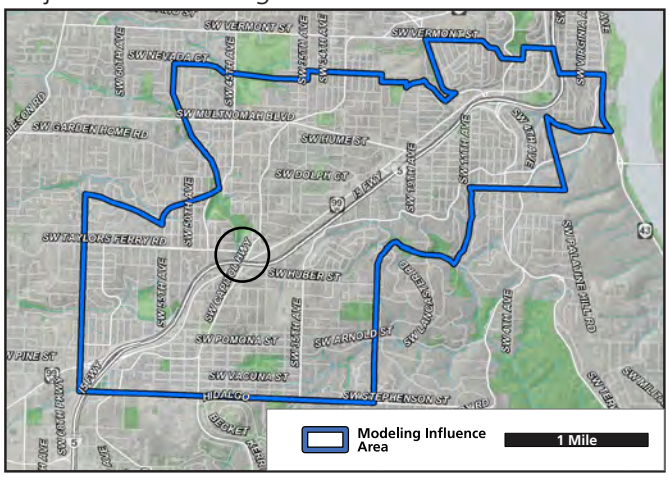
Project includes various intersection improvement types (such as roundabouts) and roadway realignments to be refined.

Implements Barbur Concept Plan walk audit recommendations in the SW Portland Town Center.

Project includes maintaining two lanes in each direction on Barbur Blvd. between new intersection improvements from Huber Street north to Barbur Transit Station entrance. Project is illustrative of a group of concepts that would change circulation in this area.

Figure 2-14. SW Portland/Crossroads Multimodal Project

Figure 2-13. SW Portland/Crossroads Multimodal Project and Modeling Influence Areas



Project purpose

Support safer and more efficient movements for motorists, transit vehicles, cyclists, and pedestrians

Modeling assumptions

- Adds three roundabouts on Barbur Blvd., (one at north Transit Station entrance, one at Taylors Ferry Road and one at Capitol Highway)
- Adds a signal at Barbur and Huber and restricts southbound left turns from Barbur to Huber Street
- Adds a signal at Capitol Highway and Taylors Ferry Road with added capacity for turn lanes

Evaluation results

Summary

The project shifts traffic away from Barbur Blvd. on onto I-5 on the nearby portions of these parallel regional facilities. The assumed project configuration increases influence area delay, which is primarily due to the roundabout at Barbur Blvd. and Capitol Highway (includes the southbound on-ramp to I-5) being overwhelmed by traffic headed for the I-5 southbound ramp. Further project refinement would be needed to address this demand.

Change in travel patterns

- This project shifts traffic away from Barbur Blvd. onto I-5 on the close by portions of these regional facilities.
- Barbur Blvd. southbound, north of Taylors Ferry Road, drops by 26% or 450 vehicles/ hour, and drops by 26 % or 340 vehicles /hour northbound.
- I-5 southbound, north of Taylors Ferry Road increases by 5.5 % or 300 vehicles/hour) and increases by about 2% or 90 vehicles/hour northbound.
- Demand on the Barbur/Capitol roundabout (includes the I-5 on ramp) is about 2,200 vehicles/hour, which is close to the expected capacity.

Route travel time

- See figure 2-12 travel time route for the Spring Garden interchange project on page 39.
- The average northbound and southbound peak hour travel time increases by about 12 seconds or 3.2% along I-5 from the Barbur Blvd. on-ramp (near SW 60th) to the Terwilliger Blvd. on-ramp.
- The average northbound and southbound peak hour travel time is increased by 38-40 seconds or 8-8.4% along Highway 99W from SW 65th Avenue to just north of Terwilliger Blvd.

Area-wide delay

- With this project VHD increases about 16 hours or 13% within the influence area.
- The increase in delay is primarily due to the shift in traffic away from Barbur Blvd. on to I-5, which accounts for additional delay on I-5 both northbound and southbound between Highway 99W and Capitol Highway.
- Increased delay also occurs on Capitol Highway approaching Huber St. and southbound approaching the roundabout at Barbur Blvd.
- VMT decreases by about 1% within the influence area.

Connectivity

- Project maintains existing street connectivity while improving pedestrian and bicycle connectivity with more pedestrian/bike crossings of Barbur Blvd. and Capitol Highway

Bike/Pedestrian

- The intension of the project is to enhance pedestrian and bicycle facilities and create more and safer pedestrian/bike crossings of Barbur Blvd. and Capitol Highway.

Capitol Highway Improvements (5009)

Project description

$24.6 M (2022)

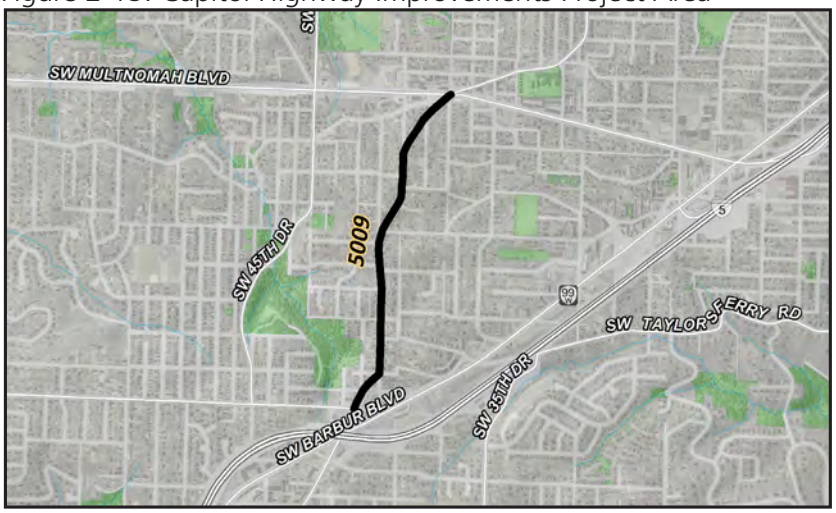
Improves SW Capitol Highway from SW Multnomah Boulevard to SW Taylors Ferry Road per the Capitol Highway Plan

Replaces existing roadway and adds sidewalks, bike lanes and green stormwater features

Modeling assumptions

No modeling impact.

Figure 2-15. Capitol Highway Improvements Project Area



Capitol Highway Improvements (5009)

Project purpose

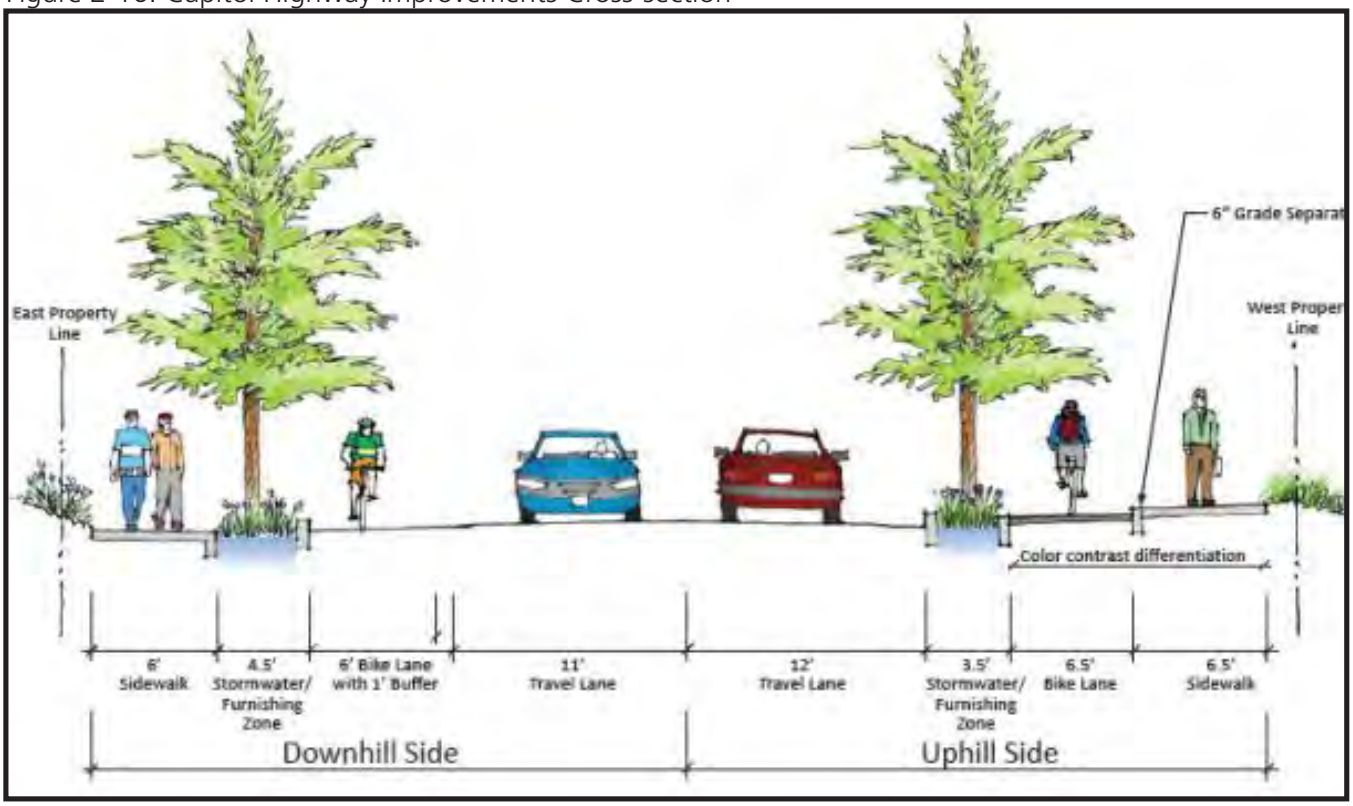
Improve connectivity, safety, and comfort for cyclists and pedestrians

Evaluation results

Bike/Pedestrian

- This project adds sidewalks and bike lanes to a street to improve safety and comfort for people walking and biking.

Figure 2-16. Capitol Highway Improvements Cross-section



Boones Ferry Road Improvements – Madrona to Kruse Way (5004)

Project description

Phase 2: Oakridge/Reese to Kruse Way

$11.6 M (2022)

Widen to include bike lanes and sidewalks with street trees, lighting and landscaping, median and turn lanes.

Figure 2-17. Boones Ferry Road Improvements - Madrona to Kruse Way Project Area

Phase 1, Madrona to Oakridge/Reese will be constructed by Lake Oswego within the next five years.

Phase 1 will widen Boones Ferry to include bike lanes, sidewalks with street trees, lighting, street furniture, landscaping, median, and turn lanes, add new signal at Madrona Street and improved pedestrian crosswalks including signalized pedestrian crossing at Lanewood. It will maintain four vehicular travel lanes.

Boones Ferry Road Improvements – Madrona to Kruse Way (5004)

Project purpose

Improve connectivity, safety, and street environment for cyclists and pedestrians

Modeling assumptions

No modeling impacts.

Evaluation results

Bike/Pedestrian

- This project improves sidewalks and adds pedestrian crossings, transit amenities, and bike lanes along an active retail corridor with the potential for increased walking and biking activity.

Figure 2-18. Boones Ferry Road Improvements - Madrona to Kruse Way Project

Highway 217 Overcrossing - Hunziker Hampton Connection (1107)

Project description

$66.3M (2022)

Builds new connection of Hunziker Road to 72nd Avenue at or near Hampton St. with a new over-crossing of Highway 217.

Signalizes new roadway connection at 72nd Avenue.

Modifies existing 72nd Avenue/Hunziker intersection/connection.

Project purpose

Provide improved multimodal access between the Tigard Triangle and downtown Tigard. The intent is to improve operations at the ramp terminals, 72nd Avenue and streets intersecting 72nd Avenue, not the mainline of Highway 217.

Modeling assumptions

- Adds a new two-lane roadway connection Hunziker Road to 72nd Avenue at Hampton Street (over-crossing of Highway 217).
- Removes the existing link on Hunziker Road that connects to 72nd Avenue south of Highway 217.

Evaluation results

Summary

- The new bridge carries about 1,400 vehicles during the PM peak hour. The new route shifts some traffic away from the Dartmouth/99-W intersection, which is constrained, and adds connectivity for all modes between the Tigard Triangle and downtown Tigard. The additional traffic attracted to Hunziker creates additional demand for the Hall/Hunziker/Scoffins intersection realignment project (1100).

Figure 2-19. Highway 217 Overcrossing-Hunziker Hampton Connection Project Location in SW Corridor

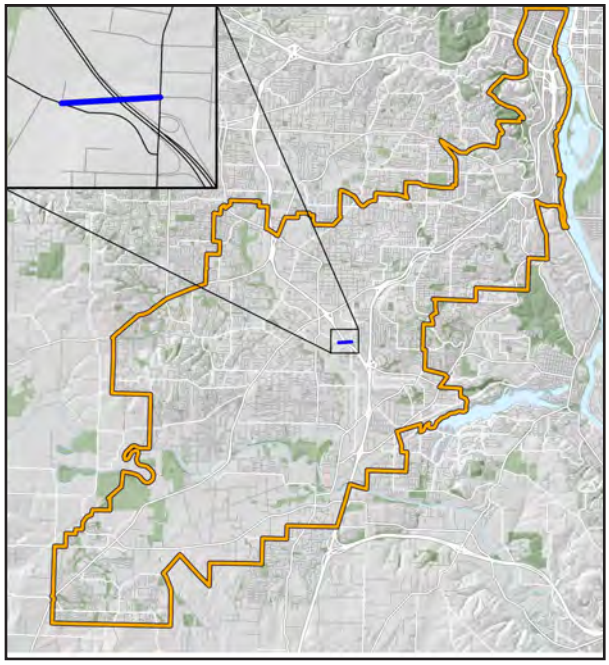
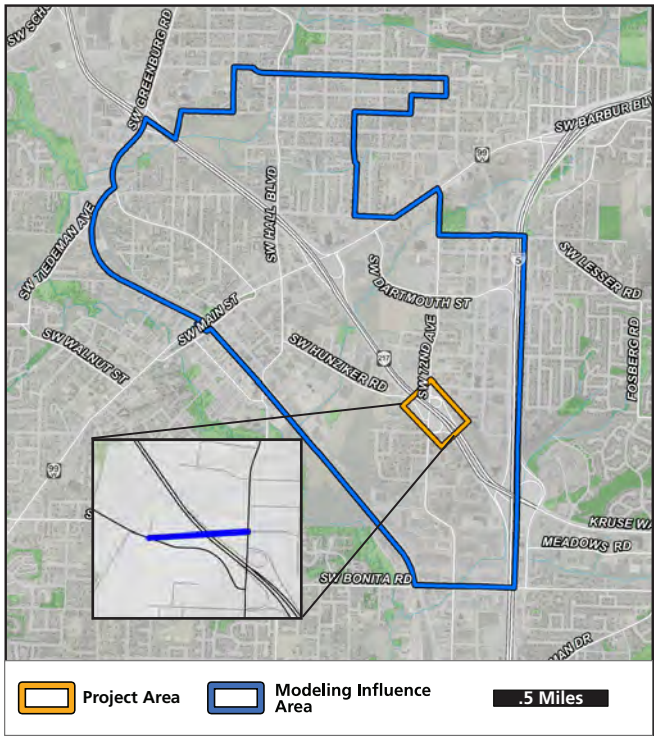


Figure 2-20. Hwy 217 Overcrossing-Hunziker Hampton Connection Project and Modeling Influence Areas



Highway 217 Overcrossing - Hunziker Hampton Connection (1107)

Change in travel patterns

- Westbound traffic increases by about 53 % or 300 vehicles/hour on Hunziker Street; eastbound remains about the same. The westbound traffic increase will put pressure on the Hunziker/ Hall/ Scoffins intersection.
- In combination with the Atlanta Street Extension (1078), this project takes about 300 vehicles/hour, a 28 to 38% decrease, off of Dartmouth Street (west of 72nd) in each direction.
- Dartmouth Street peak hour volumes at the westbound approach to Highway 99W will cause some congestion that would be relieved by the new Hunziker Hampton connection.

Route travel time

- The average westbound and eastbound auto travel times are reduced by 25 – 30 seconds between SW Main/ SW Tigard Street in downtown Tigard and SW 66th Ave. / SW Hampton Street. Westbound this is an 8 – 9% reduction in travel time.

Area-wide delay

- This project, High Capacity Transit (HCT), and the Atlanta Street Extension, all would affect the VHD within the influence area.
- With the addition of HCT and without the 72nd Ave. minor widening projects, VHD is reduced by 1.6 to 1.9%.
- With HCT and the 72nd Ave. projects included, VHD in the influence area remains about the same.
- Vehicle miles traveled (VMT) remains the same with this project

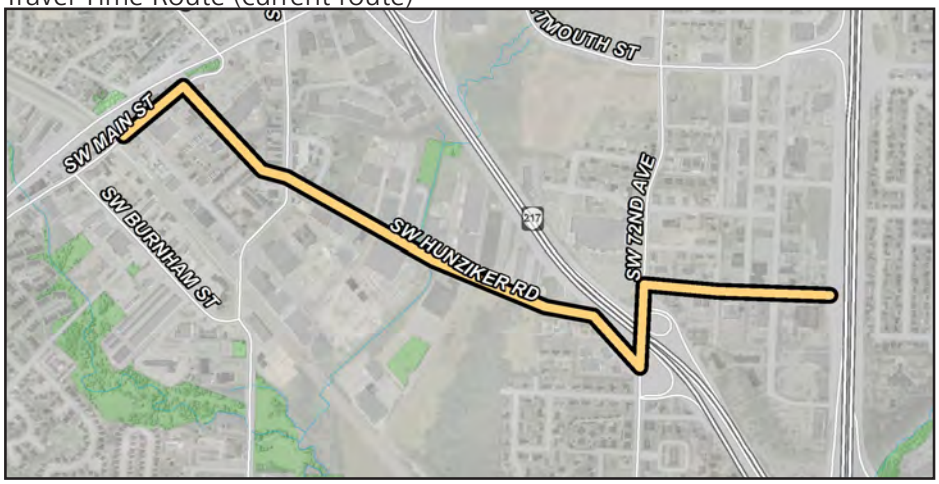
Connectivity

This project provides a faster, more direct connection for motorist, transit riders, bicyclist and pedestrians between downtown Tigard and the Tigard Triangle and supports the use of HCT (with transit on the new structure) and provides a new roadway with bike lanes and sidewalks.

Bike/Pedestrian

This project would provide the only ped/bike route free of freeway ramp crossings between the Tigard Triangle and downtown Tigard. It provides for the increase in daily bicyclists travelling on Hunziker and on 72nd from 99W to Bridgeport Village. This project increases the pedestrian connections west of the Tigard Triangle and thereby supports a HCT station in the Tigard Triangle, especially an HCT alignment on 72nd.

Figure 2-21. Highway 217 Overcrossing-Hunziker Hampton Connection Travel Time Route (current route)



Upper Boones Ferry at 72nd and Durham (1121)

Project description

$ $15.0 M (2022)

Realigns and reconfigures the intersection of 72nd/Upper Boones Ferry so that Upper Boones Ferry Road is the through route, creating a more direct route between Durham Road at Upper Boones Ferry Road & I-5/Carman Interchange;

Widens intersection of Durham & Upper Boones Ferry Road;

Widens Upper Boones Ferry to 5 lanes between Durham and I-5.

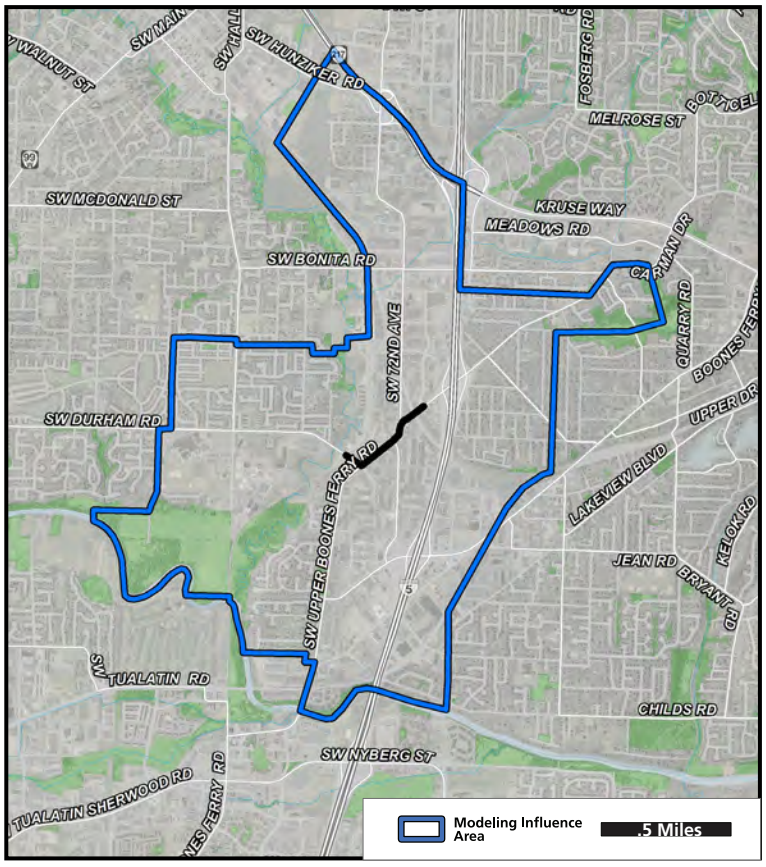
Project purpose

Create a more efficient and direct vehicle connection between Durham Road and I-5.

Modeling assumptions

- Widens (adds capacity) Upper Boones Ferry Road from 3 lanes to 5 lanes between Durham Road and 72nd/ Carman Drive
- Adds capacity for turn lanes at Upper Boones Ferry Road and 72nd Avenue
- Adds capacity for left turn lanes at northbound approach of Upper Boones Ferry/72nd/Carman intersection

Figure 2-22. Upper Boones Ferry at 72nd and Durham Project and Modeling Influence Areas



Upper Boones Ferry at 72nd and Durham (1121)

Evaluation results

Summary

The creation of a more direct route with additional capacity attracts a substantial amount of traffic along Upper Boones Ferry Road to Durham. No substantial decreases are evident on surrounding streets. The additional capacity results in less overall vehicle delay.

Change in travel patterns

- During the PM peak hour, traffic on Upper Boones Ferry Road north of Durham Road is increased by about 880 vehicles (56%) due to the increased capacity and more direct route.
- During the PM peak hour, traffic on Durham Road at Upper Boones Ferry increased by about 400 vehicles (16%) due to the increased capacity and more direct route.

Route travel time

- The average peak hour auto travel time along 72nd/Upper Boones Ferry Road from Highway 217 to Lower Boones Ferry Road is reduced by 26 to 30 seconds, about 6.5%.
- The average peak hour auto travel time along I-5 is reduced by 7 to 13 seconds, about 2 to 3%.

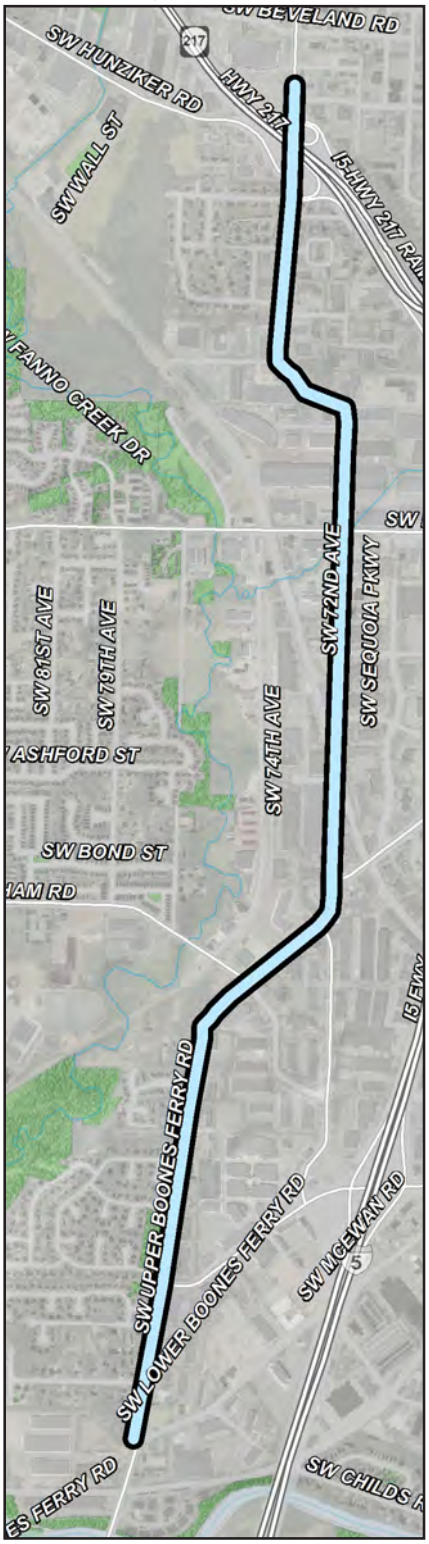
Area-wide delay

- With the addition of this project, VHD is reduced by about 11% (58 VHD) in the influence area.
- With the addition of this project, VMT is increased by about 2% in the influence area.

Bike/Pedestrian

- This project would fill some sidewalk and bike lane gaps along Upper Boones Ferry Road.
- The widening of Upper Boones Ferry Road and Durham Road would typically be expected to make crossings of the roadway more difficult for pedestrians due to the increased volume, speed, and roadway width.

Figure 2-23. Upper Boones Ferry at 72nd and Durham Travel Time Route (southbound and northbound)



Highway 217 / 72nd Avenue Interchange Improvements (1149)

Project description

$47.7 M (2022)

Completes interchange reconstruction of new diamond interchange with new ramp alignments or alternative design options

Removes Highway 217 northbound loop on-ramp and replaces with direct northbound on-ramp

New Hunziker-Hampton connection over Highway 217 removes Hwy 217 southbound off-ramp and replaces with direct southbound off-ramp to 72nd

Widens 72nd Avenue overcrossing of Hwy 217 to four lanes plus left-turn lanes between Hampton Street and Varns Street

Modeling Assumptions

Convert existing two-quadrant interchange to diamond interchange

Add lanes and capacity on 72nd Avenue between Hampton Street and Varns Street.

Project Purpose

Improve the efficiency of auto and freight movements between 72nd Ave and 217.

Figure 2-24. Highway 217 / 72nd Avenue Interchange Improvements Project and Modeling Influence Areas

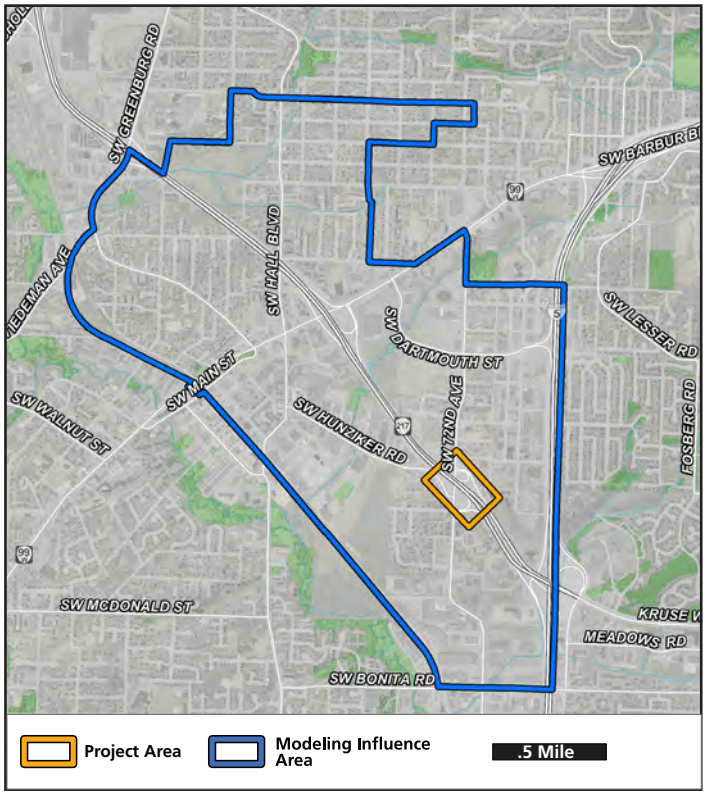
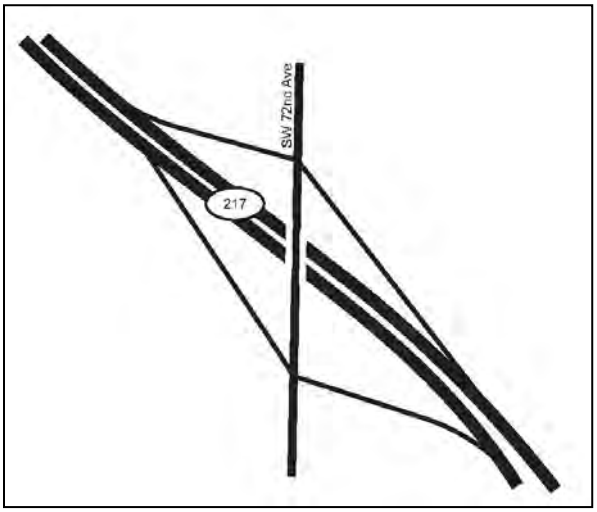


Figure 2-25. Highway 217 / 72nd Avenue Interchange Improvements Project



Highway 217 / 72nd Avenue interchange improvements (1149)

Evaluation results

Summary

- The reconstruction of the interchange as a diamond interchange creates a slightly more attractive route to OR 217 via 72nd Avenue. Overall, changes in traffic patterns and delay are relatively minor.

Change in travel patterns

- Traffic along 72nd Avenue increases 20% north of the interchange and 3% south of the interchange with the added capacity.
- Traffic using the on or off-ramps between OR 217 and 72nd Avenue increases about 10% with the more direct ramp configuration.

Route travel time

- The average travel time along 72nd Avenue is reduced by 5 – 10 seconds, about 3%, northbound and 30 – 35 seconds, about 12%, southbound in the PM peak hour.
- The average travel time along OR 217 and I-5 is not affected.

Area-wide delay

- With the addition of this project, VHD is changed by less than 1% in the influence area.
- With the addition of this project, VMT is changed by less than 1% in the influence area.

Bike/Pedestrian

- The reconstruction of the interchanges could be expected to restore the missing crosswalk at the northbound ramps.
- The widening of 72nd Avenue and addition of multiple ramp turn lanes could be expected to make crossings more difficult for pedestrians.

Boones Ferry Road: Martinazzi to Lower Boones Ferry (1134)

Project description

$15.9 M(2022)

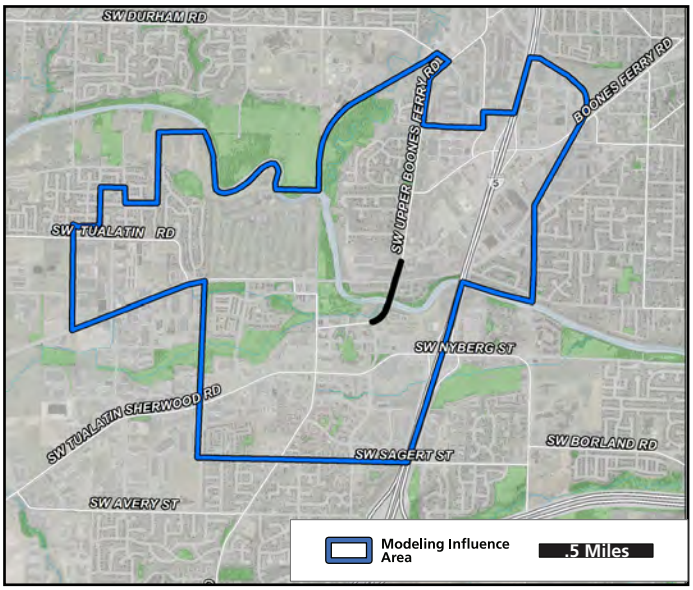
Reconstructs and widens Boones Ferry Road to five lanes from Martinazzi to Lower Boones Ferry Road, including bridge over the Tualatin River.

Project purpose

Reduce congestion on Boones Ferry Road.

Figure 2-27. Boones Ferry Road: Martinazzi to Lower Boones Ferry Project Area

Figure 2-26. Boones Ferry Road: Martinazzi to Lower Boones Ferry Modeling Influence Area



Evaluation results

Summary

Project reduces delay on Boones Ferry Road from Lower Boones Ferry to Martinazzi. Additional traffic attracted to Boones Ferry Road is able to be dispersed onto Lower Boones Ferry Road at the north end and onto Martinazzi at the south end of the project without causing another traffic bottleneck. Project is supportive of transit access if High Capacity Transit is built to Tualatin or continues to Sherwood. Project fills key sidewalk gap at the Tualatin River and adds to pedestrian connectivity.

Change in travel patterns

- This project removes a traffic bottleneck during the PM peak in both directions on Boones Ferry Road.
- This project adds about 340 vehicles /hour southbound, about a 25% increase and 320 vehicles/hour, about 24%, northbound south of Lower Boones Ferry Road.
- On Boones Ferry Road west of Martinazzi, this project attracts an additional 13% or 110 westbound vehicles/hour and about 10% more or 90 eastbound vehicles/hour, which along with about 340 vehicles/hour (+23%) more Boones Ferry Road's southbound approach to Martinazzi, will put pressure on the Boones Ferry/Martinazzi and the Boones Ferry/ Tualatin Road intersections.
- Project modestly reduces I-5 volumes (north of Tualatin exit) by about 60 vehicles/hour southbound and 80 – 90 vehicles per hour northbound.

Route travel time

- The average northbound peak hour auto travel times are reduced by 37 – 40 seconds or 15% on Boones Ferry Road and Bridgeport Road from Nyberg/Martinazzi to Bridgeport at Lower Boones Ferry.
- The average southbound peak hour auto travel times are reduced by 16 – 17 seconds or 7% on Boones Ferry Road and Bridgeport Road from Bridgeport at Lower Boones Ferry to Nyberg/ Martinazzi.
- The average southbound peak hour auto travel times are reduced by 5 seconds on I-5.

Area-wide delay

- With BRT to Sherwood and the Tualatin-Sherwood Road widening, VHD is reduced by 47 hours or 14.6% in the influence area.
- VMT increases by 2.5% in the influence area.

Bike/pedestrians

- Project adds sidewalks on widened bridge crossing of the Tualatin River, which is a key gap in the sidewalk network.
- Widening would typically be expected to make crossings of the roadway more difficult for pedestrians due to the increased volume, speed, and roadway width.

I-5 Southbound Auxiliary Lane: Lower Boones Ferry Interchange (1008B)

Project description

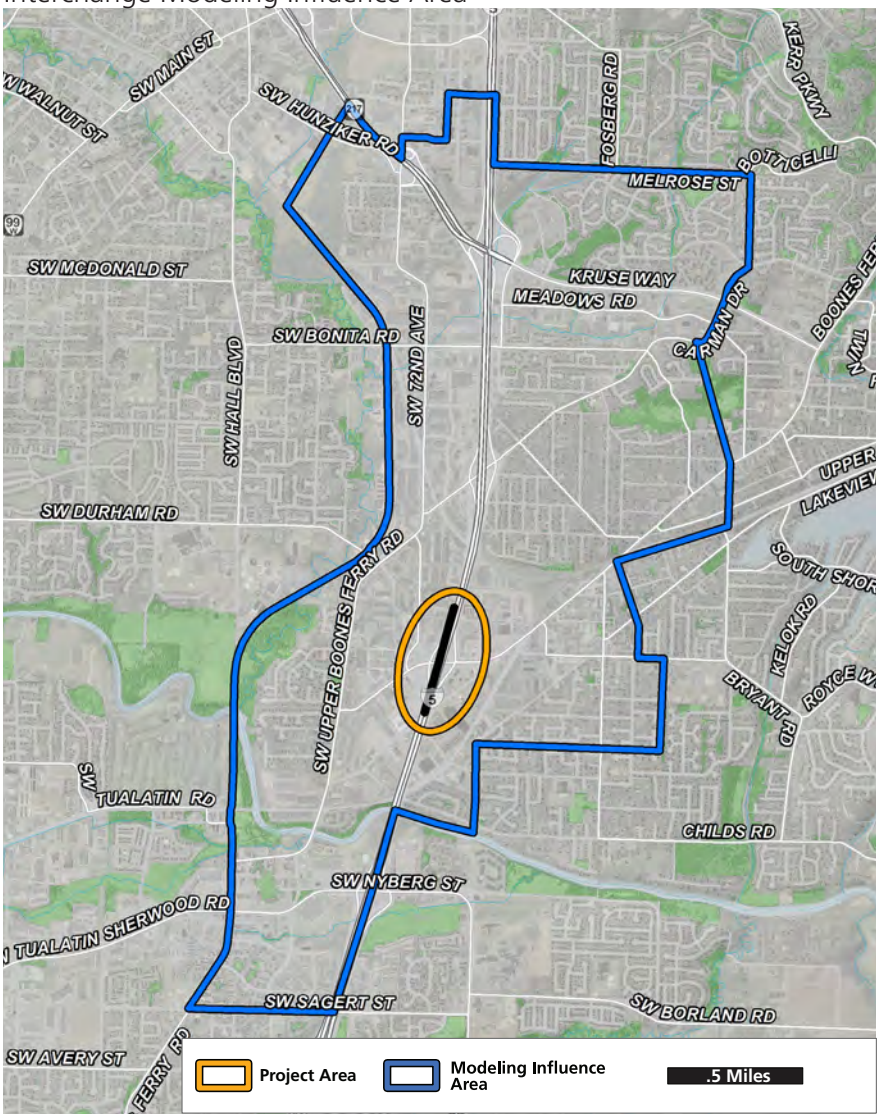
$9.7 M (2022)

Extends the I-5 southbound auxiliary lanes from the Lower Boones Ferry Road exit ramp to the Lower Boones Ferry entrance ramp. (Project is early phase of #1008)

Project purpose

Reduce congestion, improve safety, and improve reliability on southbound I-5.

Figure 2-28. I-5 Southbound Auxiliary Lane: Lower Boones Ferry Interchange Modeling Influence Area



I-5 Southbound Auxiliary Lane: Lower Boones Ferry Interchange (1008B)

Figure 2-29. I-5 Southbound Auxiliary Lane: Lower Boones Ferry Interchange Travel Time Route

Southbound on I-5 Dartmouth to I-205

Evaluation results

Summary

Project reduces southbound congestion in the auxiliary lane section.

Change in travel patterns

- This project was not isolated in the model runs and the results include the impacts of the Upper Boones Ferry at 72nd and Durham project on I-5
- I-5 is heavily congested both north and south of the project location (Lower Boones Ferry overcrossing) with or without the project.
- Southbound auxiliary lane attracts an additional 240 vehicles per hour, a 4% increase.
- Southbound I-5 volume increases are minor, an additional 60 – 130 vehicles per hour between Highway 217 and I-205, which does not impact level of service.

Route travel time

- The average southbound peak hour auto travel time is reduced by 10 seconds, about 2%, on I-5 from Dartmouth St. to I-205, when combined with the Upper Boones Ferry at 72nd and Durham intersection project.

Area-wide delay

- With the impact of the Upper Boones Ferry at 72nd and Durham intersection project, delay for I-5 Southbound Auxiliary Lane project could not be determined.

Bike/pedestrians

- This project is entirely on the freeway mainline and does not have bicycle or pedestrian impacts.

Tualatin-Sherwood Road Widening (1154)

Project description

$ $46.4M (2022)

Widens from three to five lanes with bike lanes and sidewalks from Langer Parkway to Teton Avenue.

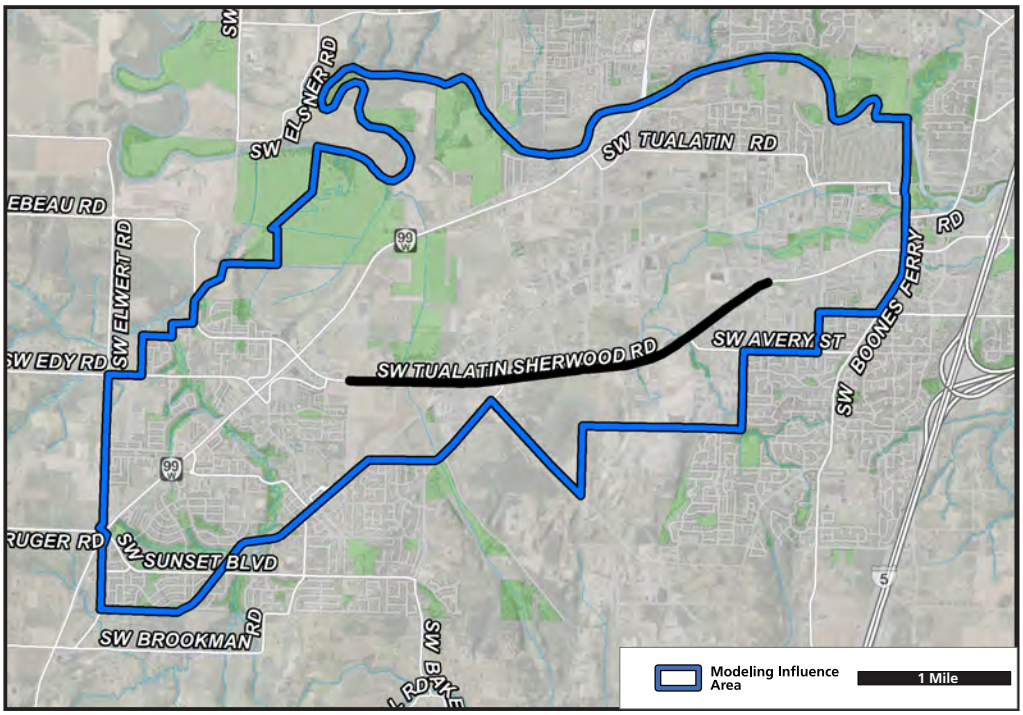
Project purpose

Improve mobility for freight and autos, while maintaining connections for cyclists and pedestrians

Modeling assumptions

- Adds two through lanes on Tualatin-Sherwood Road from Langer Parkway to Teton Avenue.

Figure 2-30. Tualatin-Sherwood Rd. Widening Project and Modeling Influence Area



Tualatin-Sherwood Road Widening (1154)

Evaluation results

Summary

- Tualatin-Sherwood Road is used by trucks for freight movement in the industrial employment areas between Tualatin and Sherwood. The project reduces delay by adding capacity in a constrained section of roadway. It attracts traffic to the widened roadway, with a small reduction in demand along Highway 99W. Travel times along Tualatin-Sherwood Road are significantly reduced.

Change in travel patterns

- Project would improve mobility on Tualatin-Sherwood Road between Oregon Street in Sherwood and Avery Street in Tualatin.
- Westbound traffic increases 37 to 38%, or 420 – 470 vehicles/hour.
- Eastbound traffic increases 28 to 38%, or 350 – 470 vehicles/hour.
- Project does not measurably change traffic volumes on Tualatin-Sherwood Road in downtown Tualatin.
- Project does create added pressure on Tualatin-Sherwood Road just east of Highway 99W in Sherwood, with the potential need to examine changes to the Tualatin-Sherwood Road/ Highway 99W intersection.

Route travel time

- The average westbound and eastbound peak hour auto travel times are reduced by 52 – 55 seconds from Nyberg Road at I-5 (downtown Tualatin) to Highway 99W at Sunset Blvd. in Sherwood, when the Tualatin-Sherwood Rd. widening is combined with the new Arrow Street (Herman) project in Sherwood. This is a reduction of about 6%.
- The average westbound and eastbound peak hour auto travel times are reduced by 37 – 39 seconds from Nyberg Road at I-5 (downtown Tualatin) to Highway 99W at Sunset Blvd. in Sherwood, when the Tualatin-Sherwood Rd. widening is combined with the Boones Ferry Road widening project in Tualatin. This is a reduction of about 4.5%.
- The average southbound peak hour travel time is reduced by 44 seconds along Highway 99W from SW 65th to Sunset Blvd. in Sherwood, when the Tualatin-Sherwood Rd. widening is combined with the new Arrow Street (Herman) project in Sherwood. This is a reduction of about 3%.
- I-5 southbound travel time is reduced by less than 1% with the Tualatin-Sherwood Road widening and the Boones Ferry Road widening (1134) projects.

Area-wide delay

- With the addition of BRT to Sherwood and the Boones Ferry Road widening project, VHD is reduced by four hours or 3.8%. (VMT increases by about 3%)
- Without BRT south of Tigard and the new Arrow Street (Herman) project, VHD is reduced by five hours or 4.7%. (VMT increases by 4%)

Bike/Pedestrian

- This project replaces existing sidewalks and bike lanes along Tualatin-Sherwood Road, and does not add to the pedestrian and bicycle connections that already exist between Tualatin and Sherwood.

Arrow (Herman Road) (1062)

Project description

$10.6 M (2022)

Constructs new road to collector standards.

Builds new 3-lane roadway, including a new stream crossing , with bike lanes and sidewalks from Phase 2 of Langer Farms Parkway (north of Tualatin-Sherwood Road) to Gerda Lane/Galbreath Drive.

New roadway utilizes the existing Arrow Street.

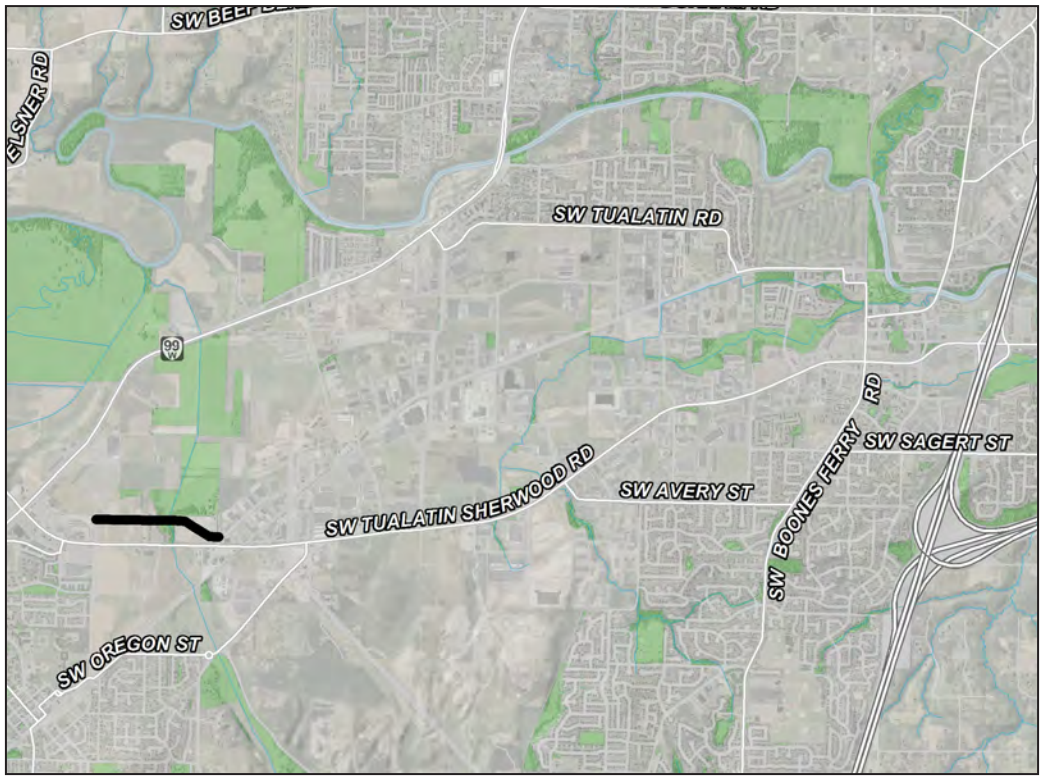
Project purpose

Create new multimodal connection between Langer Farms Parkway and Gerda/Galbreath Drive.

Modeling assumptions

- Adds new roadway links between Langer Farms Parkway and Gerda Lane/Galbreath Drive
- Adds roadway links for Gerda Lane (existing) and Galbreath Drive/Cipole Road (existing) connection to Herman Road in Tualatin
- Roadways have capacity for one lane in each direction with turn lanes.

Figure 2-31. Arrow (Herman Road) Project Area



Arrow (Herman Road) (1062)

Evaluation results

Summary:

Project provides a new multimodal connection that is well utilized between Langer Farms Parkway and Gerda/Galbreath Drive. Project provides access to new businesses and connectivity for bicycles and pedestrian on a lower volume, safer east-west connection than Tualatin-Sherwood Road. Project reduces traffic on a widened Tualatin-Sherwood Rd. westbound approaching Langer Parkway.

Change in travel patterns

- New Arrow Street connection is well utilized with about 600 vehicles/hour westbound and 370 eastbound in the PM peak.
- Compared to the BRT to Sherwood with the Tualatin-Sherwood Rd. widening (and no Arrow Street), the congestion on Tualatin-Sherwood Rd. remains minor.
- This project reduces minor congestion by reducing traffic on a widened Tualatin-Sherwood Rd. westbound (approaching Langer Parkway) by 170 vehicles/hour.
- This project reduces Highway 99W southbound traffic by about 6% or 120 vehicles/hour north of Sherwood, however, Highway 99W is not congested in this section.

Connectivity

- Provides street connectivity in an area that has no other east-west connection than Tualatin Sherwood Road. Provides access to new businesses and freight activity.

Bike/Pedestrian

- This project adds a new street with sidewalks and bike lanes between Langer Farms Parkway and Gerta Street in Sherwood (north of Tualatin Sherwood Road).

Narrowing Methodology

Project staff evaluated and are recommending a list of roadway projects based on rating projects on the following criteria:

- Critical for safe access to HCT
- Highly supportive of the land use vision in essential or priority places

Safe access to HCT

For this criterion each project was rated critical, high, medium or low as described below.

Critical

- Does it create or improve pedestrian access on a connection HCT will use?
- Does it help people safely access a station by walking or bicycling within 1/4 - 1/2 mile or a trail within 2 miles?

Medium

- Does it help people safely access a station by walking or bicycling within 1/2 - 1 mile or a trail within 3 miles?
- Does it improve local transit service accessing the HCT?
- Does it improve road connections to an end-of-line park and ride?

Low

- None of the above, or covered by another project

Land use goals in essential/priority places

- Is the project in an essential/priority place?
- Is the project supportive of the local land use vision for the place?
- Does the project support land use by providing safe crossings or pedestrian/bicycle connections (active transportation)?

Table 2-2 on pages 62-65 provides capital costs and right of way impacts for the roadway projects selected from the wide range of projects that met the screening criteria. The table includes all roadway projects considered for narrowing the SW Corridor.

Capital Costs

As with the capital costs reported previously in this section, costs are planning-level costs escalated to 2022 to represent year of expenditure dollars and maintain a consistent basis for comparison.

Right of Way Impacts

The right of way impacts are reported by acres of potential impacts and are a very preliminary analysis. The results do not consider the impacts that would occur due to loss of access, therefore they should not be considered as a complete analysis. Impacts only include where a project would potentially intersect with a property or building. Therefore these impacts should be considered only partially complete, but serve to provide an order of magnitude assessment and information for the next phases of the project.

Capital Costs and Right of Way Impacts

Table 2-2. Summary Table of Costs and Right of Way Impacts

Scale

No property impacts
Higher
Lower
No information or unknown

Location/ Ownership	#	Project Title	Project Description	Capital costs of projects ($M 2022)	ROW - Non-residential (acres)	ROW - Residential (acres)
Beaverton	1156	Scholls Ferry Rd. ATMS	Install integrated surveillance and management equipment.	$1.4	None	None
LakeOswego	5004	Boones Ferry Road Boulevard improvements (turn lanes with bike/ped. - Madrona to Kruse Way)	Widen to include bike lanes, sidewalks, and turn lanes. This project is Phase 2, Oakridge/Reese to Kruse Way. Phase 1 is in Low Build. (Phase 1 = $23 Million; Phase 2 = $9 Million)	$41.3	17.1	None
LakeOswego	5003	Carman Dr. Improvements (widen to 3 lanes w/bike lanes)	Reconstruct and widen to three lanes from I-5 to Quarry to include bike lanes.	$11.6	1.0	2.2
Portland	5013	Naito/South Portland Improvements (left turn pockets with bike/ped and remove tunnel, ramps and viaduct)	Reconstruct Naito Pkwy as two-lane road w/bike lanes, sidewalks, left turn pockets, & on-street parking. Remove grade separation along Naito at Barbur Blvd. (tunnel), the Ross Island Bridge, Arthur/Kelly (viaduct), and the Grover pedestrian bridge. Naito Parkway - Kelly to Abernethy	$51.2	0.0	
Portland	5057	SW 53rd and Pomona (improves safety of ped/bike users)	Reconfigure and improve intersection to manage traffic turning speeds, and improve safety of ped/bike users between Barbur and Pomona.	$0.6	0.0	
Portland ODOT	5059	SW Portland/ Crossroads Multimodal Project (roadway realignments and modifications to Barbur Blvd., Capitol Hwy., and the I-5 southbound on-ramp)	Implement Barbur Concept Plan walk audit recommendations in the SW Portland TC, including modifications to Barbur Blvd., Capitol Hwy., and the I-5 southbound on-ramp to support safer and more efficient operation for all modes. Project specifics include intersection types and roadway realignments to be refined.	$51.6	1.4	0.1
Portland ODOT	4002	Barbur Blvd, SW (3rd - Terwilliger): Multi-modal Improvements	Construct Improvements for transit, bikes and pedestrians. Transit improvements include preferential signals, pullouts, shelters, left turn lanes and sidewalks and crossing improvements.	$8.5	0.8	0.5
Portland ODOT	5005	Barbur Blvd, SW (Terwilliger - City Limits): Multi-modal Improvements	Complete boulevard design improvements including sidewalks and street trees, safe pedestrian crossings, enhance transit access and stop locations, and bike lanes (Terwilliger - SW 64th or Portland City Limits).	$32.0	5.4	0.2
Portland ODOT	5006	Barbur Lane Diet: Terwilliger to Capitol	Reduce number of northbound travel lanes on Barbur from Terwilliger to Capitol Highway (north) from two to one to reduce speed and improve safety. Adds bike lanes over Newberry and Vermont bridges.	$0.3	None	None
Portland ODOT	1019	Barbur Road Diet - Capitol to Hamilton (reduce northbound lanes from three to two with multi-modal improvements)	Reduce number of northbound lanes from three to two from Capitol Hwy (north) to 1/4 mile south of Hamilton to reduce speeds and improve safety, improve ped/bike crossing safety and add protected bike lanes	$0.3	None	None
Portland ODOT	5007	Barbur Signals (add signalized intersections)	Add signalized intersections to improve pedestrian/bike crossing and moderate traffic speeds at Baird, Alice, 13th, and Luradel	$2.3	None	None
Portland ODOT	5008	Barbur/ Capitol Hwy./ Huber/ Taylors Ferry Intersection Safety Improvements	Construct safety improvements, including traffic signals, at the intersection of Capitol Hwy, Taylors Ferry, Huber, and Barbur. Provide better sidewalks and crossings.	$1.8		

Capital Costs and Right of Way Impacts

Scale

No property impacts
Higher
Lower
No information or unknown

Location/ Ownership	#	Project Title	Project Description	Capital costs of projects ($M 2022)	ROW - Non-residential (acres)	ROW - Residential (acres)
Portland ODOT	1028	Barbur/Terwilliger Intersection Ped./Bike Improvements	Ped/bike improvements at Barbur/Terwilliger	$2.6		
Portland	5009	Capitol Hwy Improvements (replace roadway and add sidewalks)	Improve SW Capitol Highway from SW Multnomah Boulevard to SW Taylors Ferry Road per the Capitol Highway Plan. Replace Existing Roadway and add sidewalks, bike lanes and green stormwater features.	$24.6	1.2	0.1
Portland ODOT	1044	South Portland Circulation and Connectivity	Adds a new ramp connection between I-405 and the Ross Island Bridge from Kelly Avenue. Restore at-grade intersections along Naito Parkway, with new signalized intersections at Ross Island Bridge access and at Hooker Street. Removes several existing roadways and ramp connections.	$28.4	2.5	0.2
Portland ODOT	1037	SW Portland I-5 Partial Split Spring Garden Interchange (includes closing existing SB and NB off-ramps)	Reconfigure the I-5 Spring Garden interchange as a partial split, by creating I-5 SB ramps connecting to Barbur Blvd just south of SW 26th, and creating NB on- and off-ramps at Spring Garden. Would close Existing SB off-ramp at Spring Garden and NB off-ramp at Taylor's Ferry. Could be constructed in two phases.	$103.1	0.2	0.7
Portland KingCity Tigard ODOT	1015	Hwy 99W TSMO: Downtown Portland to SW 124th	Transportation System Management and Operations. ACM with Adaptive Signal Timing and Transit Priority Treatment from SW Portland to SW 124th. (Signals from I-5/99W to Durham already improved.)	$0.6	None	None
Portland Tigard Tualatin ODOT	1013	I-5: Active Traffic Management	Install sensors, variable message signs, and other techniques, such as variable speeds, to reduce congestion and improve safety.	$3.9	None	None
Tigard	1111	Oak-Lincoln-Locust Street Collector System (Connectivity Improvements)	Build Lincoln Street Extension to Oak Street. New roadway connection will distribute east/west trafffic between Locust and Oaks Streets and improve accessiblity to Lincoln Center Commercial district.	$1.3	0.5	None
Tigard	5024	68th Avenue (widen to 3 lanes)	Widen to 3 lanes between Dartmouth/I-5 Ramps and south end	$17.4	2.2	None
Tigard WashCo.	5027	72nd Ave. Widening: Hunziker to Durham (widen to 3 or 5 lanes)	Widen 72nd Avenue between Hunziker and Upper Boones Ferry Road to 3 lanes (3 or 5 lanes in RTP)	$18.1	2.7	None
Tigard	1077	Ash Avenue railroad crossing (new roadway)	Extend Ash Avenue across the railroad tracks from Burnham to Commercial Street.	$3.9	1.7	None
Tigard	1078	Atlanta Street Extension (new roadway)	Extend Atlanta Street west to Dartmouth Street	$4.9	16.7	None
Tigard WashCo.	1098	Hall Boulevard Widening, Bonita Road to Durham	Widen to 5 lanes; build sidewalks and bike lanes; safety improvements (construct 3 lanes with development, preserve ROW for 5 lanes)	$3.9	0.3	0.8
Tigard WashCo.	5036	Hall Boulevard Widening, McDonald Street to Fanno Creek including creek bridge	Widen to 3 lanes; preserve ROW for 5 lanes; build sidewalks and bike lanes; safety improvements	$16.1	0.1	0.7
Tigard WashCo.	1100	Hall/Hunziker/Scoffins Intersection Realignment	Realign offset intersection to cross intersection to alleviate congestion and safety issues	$6.5	0.1	0.7

Summary Table of Capital Costs and Right of Way Impacts

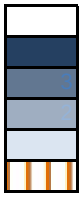
Scale

No property impacts
Higher
Lower
No information or unknown

Location/ Ownership	#	Project Title	Project Description	Capital costs of projects ($M 2022)	ROW - Non-residential (acres)	ROW - Residential (acres)
Tigard WashCo.	1107	Hwy. 217 Over-crossing - Hunziger Hampton Connection	Build new connection of Hunziker Road to 72nd Avenue at Hampton St., requires over-crossing over Hwy 217, removes existing 72nd Avenue/Hunziker intersection/ connection.	$66.3	2.6	0.0
Tigard WashCo.	5039	McDonald Street Widening, 99W to Hall	Widen to three lanes with sidewalks, bike lanes, and safety improvements	$10.3	0.3	2.0
Tigard WashCo.	5028	72nd Avenue Widening: 99W to Hunziker	Widen to 3 lanes between 99W and Dartmouth, and to 5 lanes between Dartmouth and Hampton.	$7.7	2.4	0.2
Tigard WashCo. ODOT	5035	Hall Boulevard Widening, Highway 99W to Fanno Creek	Widen to 3 lanes plus on-street parking (or potential 5 lanes); build sidewalks and bike lanes; safety improvements	$3.2	5.5	2.4
Tigard WashCo. ODOT	5037	Hall Boulevard Widening, Oleson to 99W	Widen to 3 lanes; build sidewalks and bike lanes; safety improvements	$4.5	6.9	0.6
Tigard ODOT	1129	Highway 99W access management	Implement access management strategies and median projects in Hwy 99W Plan.	$7.7		
Tigard ODOT	1114	Highway 99W/68th Ave (intersection improvements)	Intersection improvements such as protected left-turns at 68th (final improvements to be determined upon further refinement).	$1.3		
Tigard ODOT	1149	Hwy 217/72nd Ave. Interchange Improvements (reconstruction w/added ramps)	Complete interchange reconstruction of new diamond interchange with new ramps alignments. Widens 72nd overcrossing of Hwy 217 between Hamption Street and Varns Street.	$47.7	0.2	None
Tigard Durham WashCo.	1121	Upper Boones Ferry at 72nd and Durham Intersection Improvements (reconfigure)	Realigns reconfigures intersection of 72nd & Upper Boones Ferry to create a through route between Durham Road & I-5/Carmen Interchange; and widens intersection of Durham Upper Boones Ferry Road. Widens Upper Boones Ferry to 5 lanes Between Durham and I-5.	$15.0	2.3	None
Tualatin ODOT	1008A	I-5 Northbound - Lower Boones Ferry exit ramp (add a lane)	Convert the existing I-5 northbound exit ramp to Lower Boones Ferry Road from a one-lane exit to a two-lane exit ramp. (Project is early phase of #1008)	$1.9		
Tualatin ODOT	1008B	I-5 Southbound - Auxiliary lane Lower Boones Ferry exit ramp to Lower Boones Ferry entrance ramp.	Extend the I-5 southbound auxiliary lane from the Lower Boones Ferry Road exit ramp to the Lower Boones Ferry entrance or on-ramp. (Project is early phase of #1008)	$9.7		
Tualatin	5049	Herman (multi-modal improvements, Cipole to 124th)	Reconstruction from Cipole to 124th with sidewalks and bike lanes	$5.3	0.5	None
Tualatin	5048	Herman (multi-modal improvements, Teton to Tualatin Rd.)	Improve to urban standard from Teton to Tualatin.	$3.2	0.5	0.1
Tualatin WashCo.	1135	Boones Ferry (interconnect 4 signals south of TS Road)	Interconnect signals on Boones Ferry Road from Tualatin-Sherwood Road to Ibach (4 signals).	$0.1	None	None
Tualatin WashCo.	1134	Boones Ferry Road (reconstuct/widen from Martinazzi to Lower Boones Ferry)	Reconstruction/widen to 5 lanes from Martinazzi to Lower Boones Ferry Road, including bridge.	$15.9	0.2	0.3
Tualatin WashCo.	5047	Cipole Rd. (widen to 3 lanes with ped./bike)	Reconstruct/widen to 3 lanes from 99W to Tualatin-Sherwood Road with sidewalks and bike lanes.	$16.8	2.9	0.1
Tualatin Sherwood WashCo.	1154	Tualatin-Sherwood Rd. (Langer Parkway to Teton Ave.) - Widening to 5 lanes with ped./bike	Widen from 3 to 5 lanes with bike lanes and sidewalks from Langer Parkway to Teton Ave.	$46.4	16.5	0.1

Summary Table of Capital Costs and Right of Way Impacts

Scale

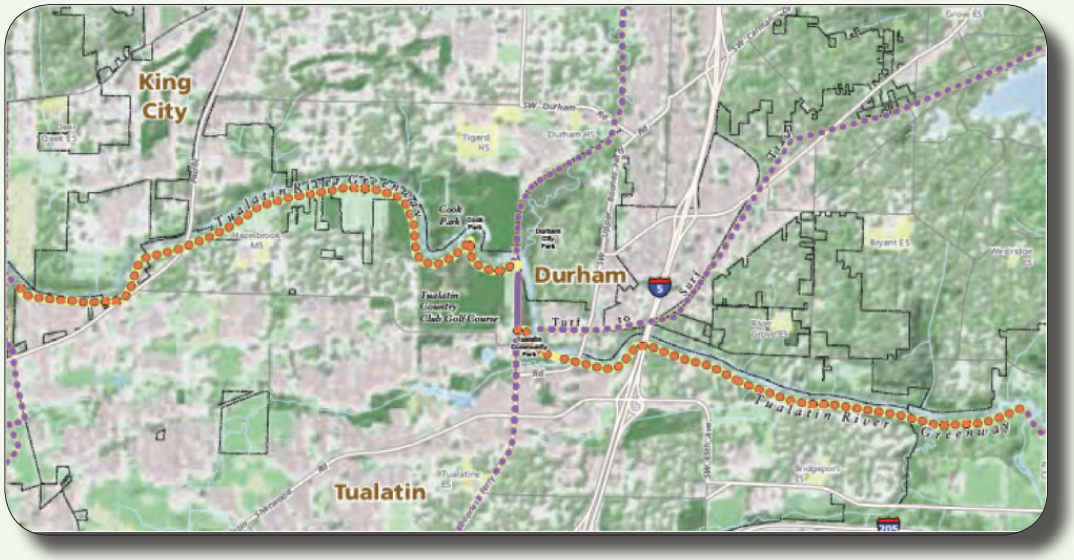


No property impacts
Higher
Lower
No information or unknown

Location/ Ownership	#	Project Title	Project Description	Capital costs of projects ($M 2022)	ROW - Non-residential (acres)	ROW - Residential (acres)
Sherwood	5020	Oregon-Tonquin Intersection & Street Improvements	Intersection improvements (consider roundabout) on Oregon at Tonquin Road; sidewalks and bike access through the intersection.	$2.5		
Sherwood	1068	Town Center Signal & Intersection Improvements (Downtown Sherwood)	Improve 3-leg intersection at Edy & Borchers; remove traffic signal at Baler; on Sherwood Blvd. remove traffic signal at Langer and disallow left turns from Langer to Sherwood, and add traffic signal at Century Dr.	$3.6		
Sherwood	1062	Arrow Street (Herman Road) - Build 3 lanes with sidewalks and bike lanes	Construct new road to collector standards. Build new 3 lane roadway with stream crossing and with bike lanes and sidewalks from Langer Farms Parkway Phase 2 to Gerda Lane/Galbreath Drive.	$10.6	9.6	None

Active Transportation

Active transportation means non-motorized forms of transportation including walking and biking. The pedestrian, bicycle and trail projects described and evaluated in this section are a subset of the active transportation projects that met the initial project screening for the Southwest Corridor Transportation Plan.



Introduction

Reliable transportation choices enhance quality of life and provide access to great, livable neighborhoods. The built environment presents many parking lots, driveways, and high-speed arterials as the only connecting roads. Most bicycle routes in the corridor follow high-speed high volume arterials. Limited parallel, low traffic, calm routes are available to avoid unsafe riding conditions. High speeds, few marked crossings, and limited sight distances can all contribute to unsafe conditions.

Purpose

This section provides a snapshot of the evaluation of proposed and planned active transportation, i.e. trails, pedestrian and bicycle projects in the Southwest Corridor. The intent of this summary is to establish the foundation for decisions about the Refinement Phase of the Southwest Corridor Plan. Decision makers will consider a wide array of needs and opportunities in the corridor to determine which projects to include in the regional integrated investment strategy in summer 2013 and for further refinement in next phase of the regional SW Corridor Plan.

Connectivity

The Southwest Corridor features a lack of street connectivity, hills, and limited or no provision of safe crossings, sidewalks, bicycle facilities, way finding or secure bicycle parking. Many gaps in the pedestrian and bicycle network remain; 327 miles of roadways lack sidewalks. Issues of connectivity affect access to major employment, education, and retail centers. These issues are largely a product of geography and the locations of freeways and highways in the corridor. In the north, steep terrain prevents the development of a grid network. Throughout the corridor, but especially in the Tigard Triangle area, I-5, OR-217, and Highway 99W create barriers that obstruct connectivity. The Tualatin River presents a barrier to connectivity between the Cities of Tigard, Tualatin, and Rivergrove.

Health

The population's health concerns in the Southwest Corridor have links to physical activity and air quality. Sidewalks, trails, bicycle facilities, transit or roadway improvements and zoning changes can increase opportunities for residents to engage in recreation, physical activity and a healthy diet, which may lead to a healthy outcomes. Trails, parks, tree canopy and open spaces reduce stress, improve air quality, and increase opportunities for physical activity and recreation. Therefore, health is reflected in the evaluation of active transportation projects within the Southwest Corridor

Integrated relationships

Complex relationships exist between the wide array of opportunities and challenges in the Southwest Corridor and will need to be considered holistically in the evaluation of projects within the Southwest Corridor. The entwined nature of demographic shifts, health, employment, housing, community amenities, parks and habitat, air and water quality, and transportation necessitate further investigation to develop a sound strategy for investment.

Needs

The needs for the active transportation elements of the Southwest Corridor Plan were formulated on the foundation of the Regional Transportation Plan (RTP), in collaboration with the Active Transportation Working Group and SW Corridor jurisdictional partners. The RTP policy framework include the regional complete bicycle and pedestrian network concepts and the performance target of tripling the bike, ped, and transit mode shares from 2005 to 2035. Therefore, the Southwest Corridor Plan active transportation needs are:

- Fill gaps in the regional bicycle and pedestrian networks
- Provide safe bicycle and pedestrian crossing opportunities

Introduction

- Improve safety and comfort by providing separation between high speed high volume vehicle traffic and bicyclists and pedestrians
- Improve street connectivity and reduce out of direction travel

Source documents

A wide range inventory of pedestrian, bicycle and trail projects was compiled from a variety of sources, including the RTP project lists, RTP policy (gaps and deficiencies), jurisdictional local transportation system plans (TSP),Plans, other plans and studies (neighborhood and concept plans, TriMet Pedestrian Network Analysis), public and partner input, parks and trails staff input, and individual land use planning processes. This process has also been closely coordinated with the Regional Active Transportation Plan.

Methodology

The following sections summarize the methodology used to identify active transportation projects for the refinement phase of the SW Corridor Plan, the shared integrated investment strategy. The evaluation of active transportation projects focused on a subset of the evaluation criteria, including support for the land use vision, access to high capacity transit, and pedestrian and bicycle connectivity.

Land use vision

The Southwest Corridor Land Use Vision is a compilation of the four Southwest Corridor related land use planning efforts in the cities of Portland, Tigard, Tualatin and Sherwood. The Land Use Vision helps define those areas with the greatest potential to become future areas of commercial, employment, retail and high density residential developments. These areas were then defined as essential, priority, opportunity and neighborhood place types (figure 3-1) based on existing transit, existing household and employment densities, projected household and employment densities based on the local land use visions, and focus areas identified by project partners. The initial key places identified were then refined and prioritized by project partners. The criteria for land use support that were considered for active transportation projects are:

- Is the project in an essential/priority place?
- Is the project supportive of the local land use vision for the place?
- Does the project support land use by providing safe crossings or pedestrian/bicycle connections (active transportation)?

Access to high capacity transit

Active Transportation Projects were recommended based on whether it was critical for safer access to HCT. The specific criteria for safer access to High Capacity Transit that were considered for active transportation projects include:

Critical

- Does it create or improve ped access on a connection HCT will use?
- Does it help people safely access a station by walking or bicycling within 1/4 mile or a trail within 1 mile?

High

- Does it help people safely access a station by walking or bicycling within 1/4 - 1/2 mile or a trail within 2 miles?

Medium

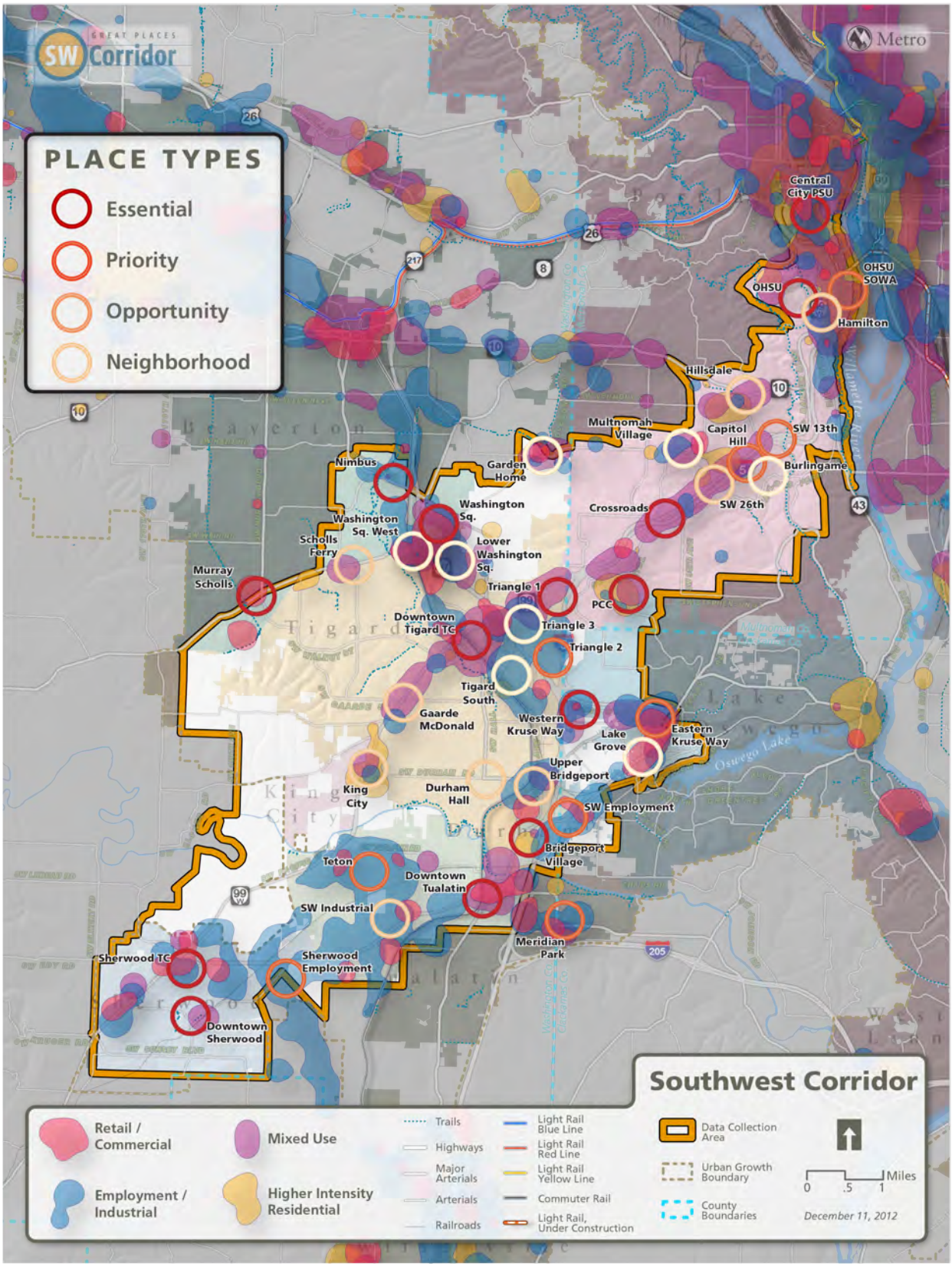
- Does it help people safely access a station by walking or bicycling within 1/2 - 1 mile or a trail within 3 miles?
- Does it improve local transit service accessing the HCT?
- Does it improve road connections to an end-of-line park and ride?

Low

- None of the above, or covered by another project

Introduction

Figure 3-1. Place Types



Evaluation Summary

Bicycle connectivity

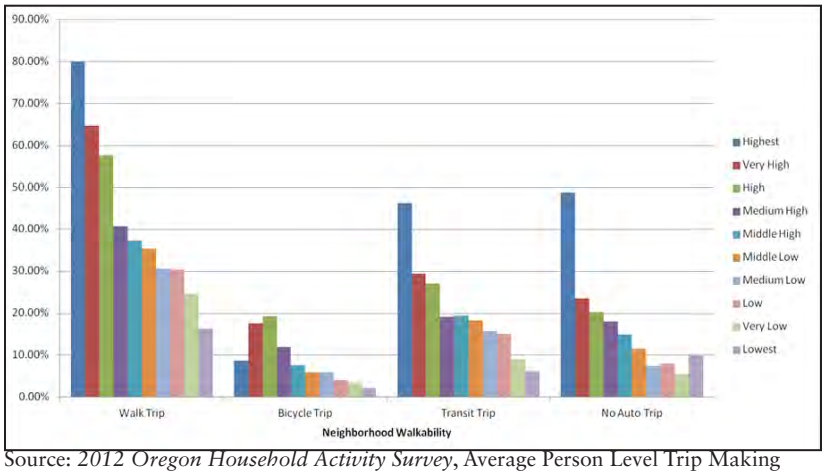
Transportation models for auto and transit networks have been developed and refined over several decades. Metro's bicycle modeling tool was developed in 2011-12 and modeling for the Southwest Corridor represents one of the first few utilizations of the tool for planning purposes.

The Southwest Corridor conducted one model run with low-build and build alternatives. The low-build alternative consisted of a modified RTP 2035 bicycle network; the build alternative added to the RTP 2035 bicycle network with all of the SW Corridor active transportation and roadway projects. The bicycle model uses the 2035 gamma land use assumptions. Bicycle trips are modeled using early spring conditions. The bicycle model results are for utilitarian bicycle trips; recreational trips are not included.

Pedestrian connectivity

This analysis illustrates sidewalk connectivity within a half-mile walking distance of potential high capacity transit stations and connectivity to Essential and Priority Places. ArcGIS Network Analyst was used to derive half-mile service areas around potential HCT stations and Key Places. The connectivity of sidewalks and trails was then measured in network distance, not "as the crow flies." The analysis assumes that pedestrians will only travel on either sidewalks or trails.

Figure 3-2. Percent of Households Making at Least One Trip by Mode; Compared by Neighborhood Walkability



Source: *2012 Oregon Household Activity Survey*, Average Person Level Trip Making

Figure 3-3. Bicycle Miles Traveled – Change from Low Build to Build

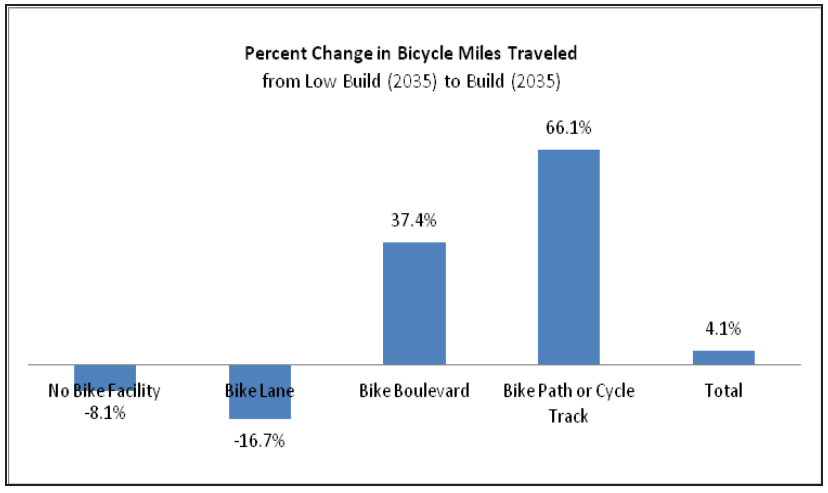
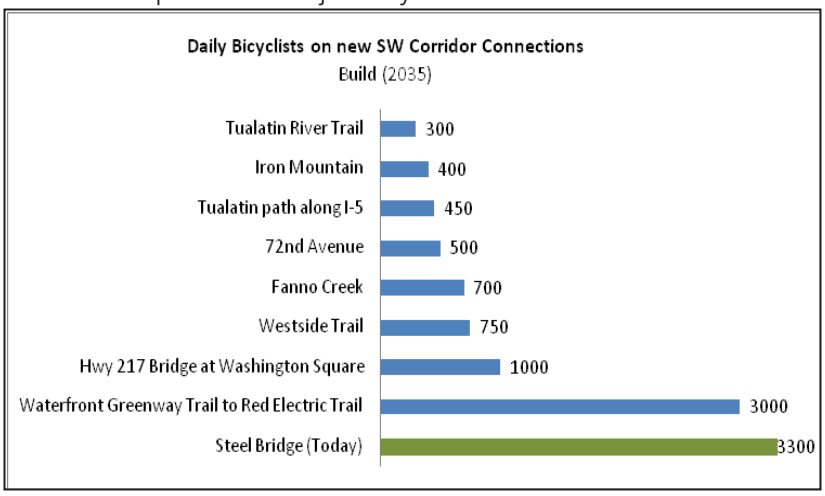


Figure 3-4. Sample Results of Daily Bicyclists on SW Corridor Active Transportation Projects by Link



Regional Active Transportation Plan Network

The Southwest Corridor collaborated and coordinated with the Regional Active Transportation Plan on identifying and evaluating active transportation projects. The Draft Regional Active Transportation Plan identifies Regional Bicycle Parkways and Regional Pedestrian Parkways as well as Community Bikeways and Community Pedestrian Corridors. . Several Southwest Corridor active transportation projects are in corridors identified as Regional Bicycle and/or Pedestrian Parkways.

A network of off-street trails, in-street separated bikeways, bicycle boulevards and other bicycle facilities make up the regional bicycle network. Regional Bicycle Parkways form the spine of the regional bicycle network and connect Regional Bicycle and Pedestrian Districts, such as the region's urban centers, where bicycle activity is or has the potential to be high.

All streets except limited access highways and off-street trails are part of the regional pedestrian network. The Principal Regional Pedestrian Network is comprised of Regional Pedestrian Parkways linking Regional Pedestrian and Bicycle Districts and forms the spine of the entire regional pedestrian network.

This section documents the evaluation results of a subset of the active transportation projects that were included in the integrated strategies as part of the Southwest Corridor Plan. The subset of projects described and evaluated in this section were included for one or more of the following reasons:

- Highly supportive of HCT and desired land use in essential or priority places, or
- Ensure representation of all jurisdictions and a range of project types (e.g. crossings, sidewalks, trails, bike lanes) or
- Relatively high costs.

Health

Walking and bicycling are important components of a healthy lifestyle and help to create livable neighborhoods. In the Portland area, neighborhoods with greater concentrations of walkable neighborhoods, with a mixture of residential density, commercial floor to land area ratio, land use mix and intersection density, more sidewalk and bike lane coverage and higher transit density are also found to have increased walking, transit usage, and cycling, and decreased automobile usage. In a study of San Diego, these types of neighborhoods were also found to be associated with better health and traffic volume density was found to be associated with poor health.

Pedestrian Connectivity

The pedestrian connectivity study of key places and potential future high capacity transit stations demonstrates the importance of filling in the gaps of sidewalk links and crossings, station locations, and of trails and continuous pathways to expand the reach and access to high capacity transit and essential and priority places.

Bicycle Connectivity

As shown in figure 3-2, the bicycle model results show a significant shift of bicyclists from bike lanes to bike boulevards and separated facilities such as the Westside Trail and Red Electric Trail. Trails see an increase from 20% (no-build) to 32% (build) of the bicycle miles travelled. This is a shift to safer, more comfortable bicycling routes. The average length of trip is 4.7 miles.

Tualatin River Trail (9023)

Project Description

$ $11.1M (2022)

The Tualatin River Trail (9023) would develop a continuous east-west multi-use pathway along the Tualatin River from Boones Ferry Road under I-5 to the Tualatin River Greenway and Browns Ferry Park.

The project falls within the jurisdiction of Tualatin and is identified in Metro's RTP financially constrained list. Tualatin identified the Tualatin River Trail as an important project.

The Tualatin River Trail provides critical non-motorized connections to both the HCT to Tualatin and HCT to Sherwood alignments, as well as to WES.

Evaluation

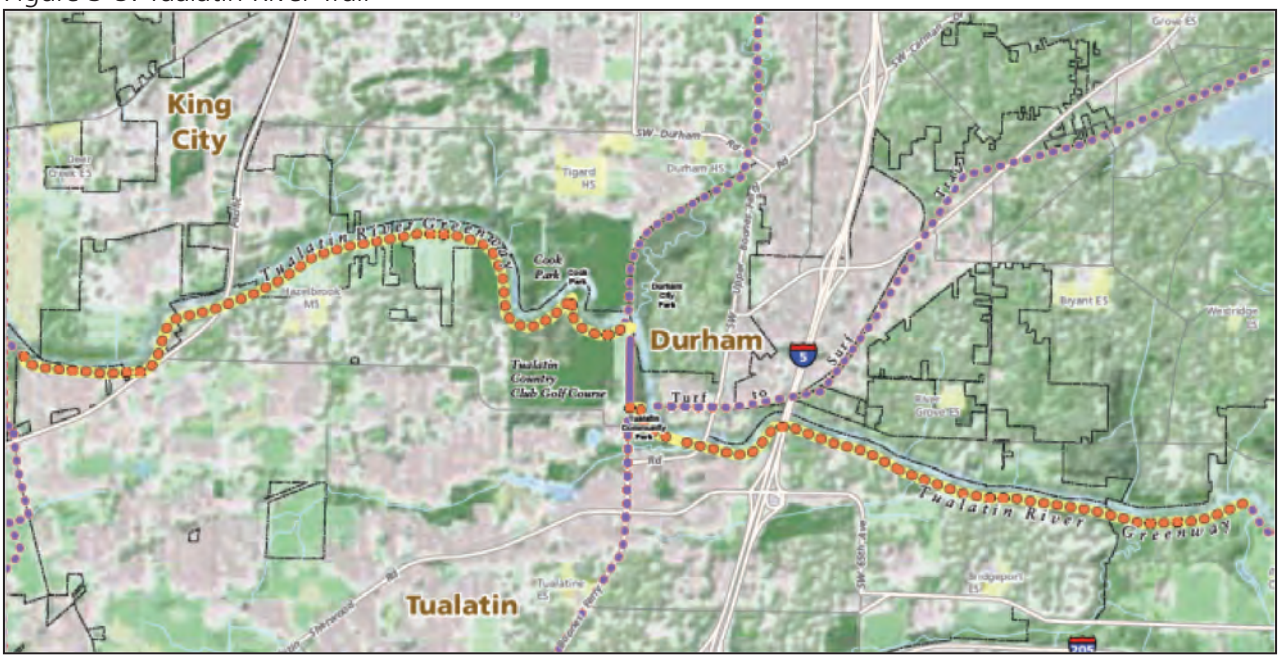
In estimating overall usage, the Metro Bike Model showed 300 bicyclists on the most traveled link, with nearly 4000 bicyclists/day using the trail. Pedestrian connectivity is improved, with safer access provided to within ¼ mile of the HCT alignments.

This project provides moderate support towards the land use goals for essential/priority places, improving connectivity (within a half-mile) to both Teton (Priority Key Place) and Bridgeport Village (Essential Key Place).

The Tualatin River Trail's functional classification in the Regional Active Transportation Plan is Regional Bicycle Parkway and Regional Pedestrian Parkway.

Reviewing travel demand, the Tualatin River Trail supports potential non-motorized travel between several key focus areas in the Southwest Corridor, particularly trips between 3 and 5 miles occurring between Teton, Downtown Tualatin, and Bridgeport Village.

Figure 3-5. Tualatin River Trail



Red Electric Trail / Slavin Road (9005, 9007)

Project Description

$ Table 3-1. Red Electric/Slavin Road Estimated Costs (2022)

Project Number	$ M
9005	22.77
9007	1.94
Combined	24.71

The Red Electric Trail (9005) provides an east-west route for pedestrians and cyclists in SW Portland that connects and extends the existing Fanno Creek Greenway Trail to Willamette Park and would provide access across I-5 to the Willamette River Greenway. The Slavin Road to Red Electric Trail (9007) portion would build a multi-use trail on Slavin Road from Barbur to Corbett.

The project falls within the jurisdiction of the City of Portland, with Project 9005 included in the RTP's financially constrained list. The City identified both projects as important for implementation.

Both projects provide critical non-motorized access to all of the HCT alternatives – The Red Electric within a half-mile, Slavin Road within a ¼ mile.

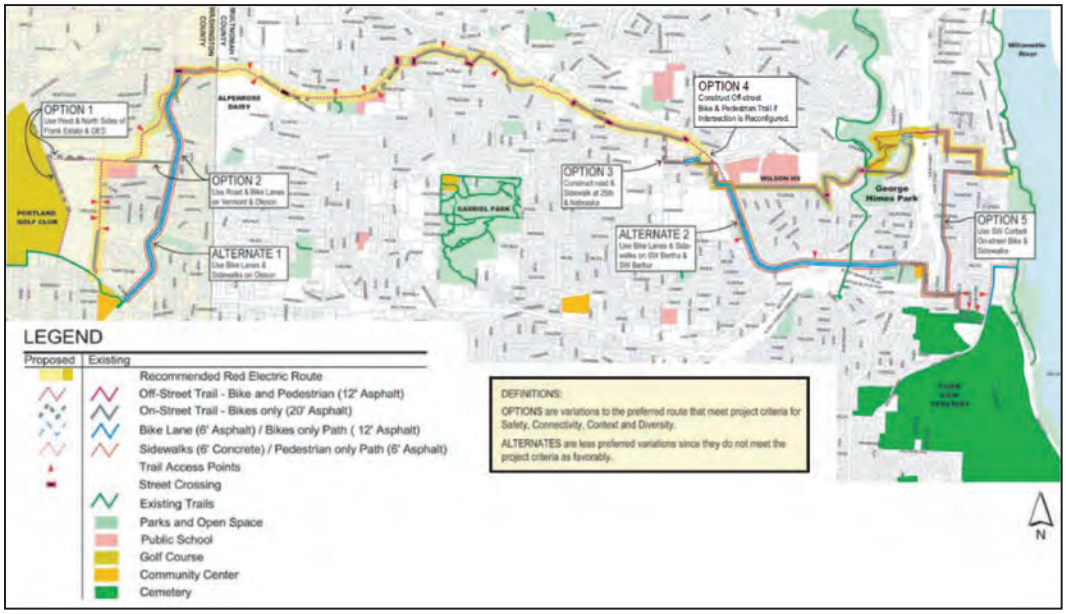
Evaluation

The projects increase east-west connectivity for bicyclists and pedestrians in the SW Corridor study area. In estimating overall usage, the Metro Bike Model showed 3300 bicyclists on the most traveled link, equivalent to the current number of bicycle trips over the Steel Bridge in downtown Portland. The Pedestrian Network Analysis indicates that pedestrian connectivity is improved, with safer access provided to within ¼- ½ mile of the HCT alignments.

Overall, this project provides little support towards the land use goals for essential/priority places

The Red Electric Trail and Slavin Road both have the same functional classification in the *Regional Active Transportation Plan* - Regional Bicycle Parkway and Regional Pedestrian Parkway.

Figure 3-6. Red Electric Trail / Slavin Road



Westside Trail (9029, 9061)

Project Description

Table 3-2. Westside Trail Estimated Costs (2022)

Project Number	$ M
9029	0.65
9061	6.45
Combined	7.10

The Westside Trail opportunities (9029) within easements of BPA and PGE provide for increased non-motorized connectivity. A new bicycle/pedestrian bridge (9061) over the Tualatin River increases access and connectivity for bicyclists and pedestrians. This project could be a joint effort with the Willamette River Water Consortium.

The projects fall within the cities of Sherwood (9029) and Tualatin (9061). Both projects were identified through a January 2013 Natural Resource review. Tualatin identified the Westside Trail - Bridge as an important project.

Neither of these projects provide critical non-motorized connections to any of the HCT alignments.

Evaluation

In estimating overall usage, the Metro Bike Model showed 750 bicyclists on the most traveled link for each project, with a total of 1500 bicyclists using the most traveled link combined. Pedestrian connectivity improves, but only within 1-2 miles of any of the identified HCT alignments.

Overall, these projects provide little support towards the land use goals for essential/priority places.

The Westside Trail's (9029) functional classification in the *Regional Active Transportation Plan* is Regional Bicycle Parkway and Regional Pedestrian Parkway. The Westside Trail Bridge is classified as a Regional Bicycle Parkway.

Figure 3-7. Westside Trail

Crossroads Active Transportation (2011, 2027, 2033, 2068, 6034)

Project Description

Table 3-3. Crossroads Active Transportation Estimated Costs (2022)

Project Number	$ M
2011	0.06
2027	6.27
2033	7.45
2068	0.32
6034	5.43
Combined	19.53

All projects in this group improve access to Crossroads, an Essential Key Place. All projects are located within Portland and provide critical non-motorized connections to all of the current HCT alignments.

Project 2011 provides important new connections to transit. Improvements include new steps and/or a ramp connecting SW Taylors Ferry frontage road to Barbur Blvd across from the transit center at existing signalized crossing. This is an important project to the City of Portland, and is a SW Corridor early opportunity project

Project 2027 would provide for a pedestrian connection near Markham School by constructing a pedestrian path and bridge over Barbur Blvd. and I-5 to connect SW Alfred and SW 52nd to Markham School. This has been identified as an important project for Portland.

Project 2033 identifies pedestrian improvements for the West Portland Town Center. Improvements include: new/upgraded sidewalks, lighting, crossings, bus shelters and benches on Barbur, Capitol Highway and neighborhood streets. This project comes from the Portland TSP and the City of Portland has identified this as an important project.

Project 2068 identifies pedestrian improvements on OR99W at the Barbur Transit Center. The project will provide pedestrian access and crossing opportunities on 99W at the Barbur Transit Center bus entrances and exits. This project has been submitted as part of a TriMet application for Oregon Department of Transportation Enhance funds.

Project 6034 would provide for bicycle and pedestrian improvements on SW Taylors Ferry Road, from SW Capitol Highway to the city of Portland limits. The project would provide bicycle lanes, including shoulder widening and drainage, and construct sidewalks for access to transit. The City of Portland has identified this as an important project.

Multimodal Roadway project # 5008 also addresses intersection safety improvements, including signals, sidewalks, and improved pedestrian and bicycle crossings at Barbur/Capitol Hwy/Huber/Taylors Ferry. There is likely to be some overlap between these various projects.

Evaluation

Pedestrian connectivity for all projects is improved, with safer access provided to within ¼ mile of all the proposed HCT alignments. The Bike Model projects 400 bicyclists on the most traveled link of Project 6034. As the other projects in this group are spot/crossing improvements for pedestrians, they were not analyzed using the Bike Model.

All of the identified projects provide critical support for the identified land use goals, improving connectivity to Crossroads, an identified Essential Key Place.

Trimet Barbur Blvd. Pedestrian Network Improvements (2072, 2073, 2074)

Project Description

Table 3-4. TriMet Barbur Pedestrian Improvements Estimated Costs (2022)

Project Number	$ M
2072	0.32
2073	4.52
2074	0.65
Combined	5.49

All three of these projects provide improved crossings along SW Barbur Blvd. Project 2072 provides unspecified additional, frequent, and protected pedestrian crossings along SW Barbur Blvd. At a minimum, protected crossings should be located every 530 ft. to provide sufficient opportunities for people to cross the street safely.

Project 2073 is aimed at shortening crossing distances, making crosswalks more visible, and providing more time for pedestrians to cross at the intersection of SW Barbur Blvd. and SW 19th Ave. Project 2074 has the same goals for the intersection of SW Barbur Blvd. and SW Bertha Blvd. All signals should, at a minimum, be timed so people have one second to walk 3.5 feet.

All of these projects fall within the City of Portland and came out of TriMet's Pedestrian Network Analysis Project. These projects have been identified as important by the City of Portland and TriMet. Portland and TriMet. These projects identify critical pedestrian crossing improvements to access transit within the project areas of the Multimodal Improvement projects # 4002 (SW 3rd to Terwilliger) and 5005 (SW Terwilliger to City Limits), which implement the Barbur Streetscape Plan.

These crossing projects provide critical non-motorized connections to all of the HCT alignments.

Evaluation

As all of these projects are spot improvement projects related to improving pedestrian crossings, they were not analyzed using the Metro Bike Model. Pedestrian connectivity is improved for all projects, with safer access provided to within ¼ mile of the HCT alignments.

These projects provide critical support towards the land use goals for essential/priority places, improving connectivity to Priority Places SW 13th and Capitol Hill. Barbur Blvd is identified on the draft Regional Active Transportation Plan as a Regional Bicycle Parkway and Regional Pedestrian Parkway.

Figure 3-8. TriMet Barbur Pedestrian Improvements

Access to Lake Oswego and Kruse Way Employment Area (3121, 6001)

Project Description

Table 3-5. Access to Lake Oswego and Kruse Way Employment Area Estimated Costs (2022)

Project Number	$ M
3121	0.26
6001	0.39
Combined	0.65

Project 3121 would install bike lanes on Bonita Road in the eastbound direction from 72nd Avenue to I-5 Bridge.

Project 6001 would install sidewalks and bike lanes on Bonita Road from Carman Dr. to Bangy Rd

The projects fall within the cities of Tigard and Lake Oswego (3121) and Lake Oswego (6001). Project 3121 was first identified in the Tigard TSP, while 6001 was identified in the 1997 Lake Oswego TSP. Both projects are identified as important projects by Lake Oswego.

Project 3121 provides critical non-motorized connections to the HCT to Tualatin and HCT to Sherwood alignments, while Project 6001 provides critical connections to all HCT alignments.

Evaluation

Project 3121 provides critical non-motorized connections to the HCT to Tualatin and HCT to Sherwood alignments, while Project 6001 provides critical connections to all HCT alignments.

Both projects are identified as important projects by Lake Oswego.

Barbur Viaducts (6003, 6004, 6005)

Project Description

Table 3-6. TriMet Barbur Pedestrian Improvements Estimated Costs (2022)

Project Number	$ M
6003	2.15
6004	4.79
6005	6.69
Combined	13.63

Constructed in the 1930s, all three viaducts lack adequate walking and biking facilities. All three of the projects in this group (6003/6004/6005) would construct new bicycle and pedestrian facilities at or parallel to the viaducts along Barbur Blvd. The viaducts are at Multnomah Street (6003), Newbury Street (6004), and Vermont Street (6005). The decision on whether the new facility would be along Barbur or a separate facility would be determined based on the HCT alignment selected. The Barbur Viaducts are related to the Barbur Blvd. Separated Bicycle Facilities Project # 3094. The 2035 Portland Bicycle Plan as well as the draft Regional Active Transportation Plan suggests that some separation between vehicle traffic and bicycles is desirable along Barbur Blvd, which could be accommodated on either new viaducts (if required for HCT) or separate Active Transportation structures parallel to the existing viaducts.

All three of the projects are important to the City of Portland. All projects provide critical non-motorized connections to all of the proposed HCT alignments.

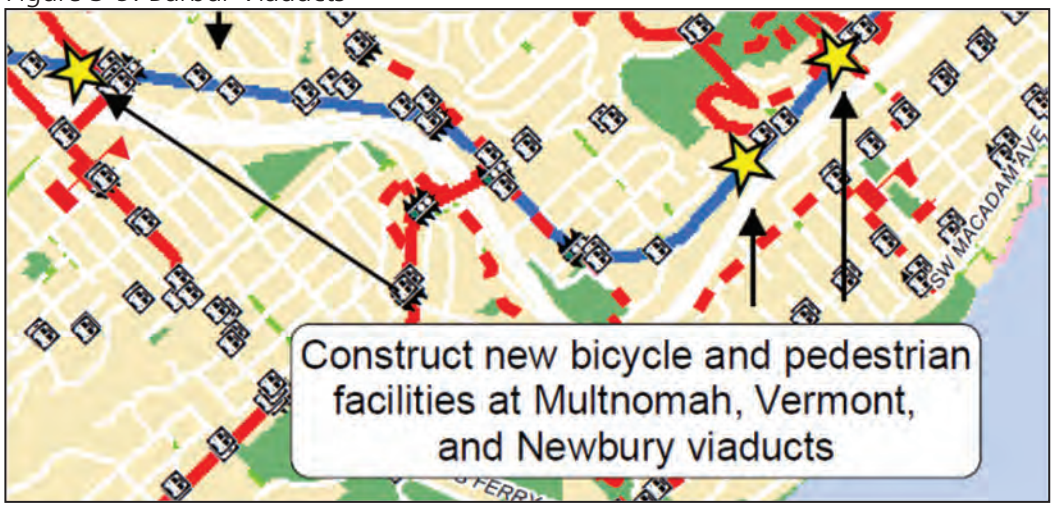
Evaluation

Using Metro's Bike Model, each of the three projects showed 300 bicyclists on its link. Pedestrian connectivity is improved, with safer access provided to within ¼- ½ of all HCT alignments.

All three projects provide low support for the land use goals for essential/priority places. The projects do improve connectivity to the priority key places Capitol Hill and SW 13th (6003) and SW 13th and OHSU (6004/6005). Barbur Blvd is identified on the draft *Regional Active Transportation Plan* as a Regional Bicycle Parkway and Regional Pedestrian Parkway.

The City of Portland also identified the Road Diet project (5006) as an interim solution to building new structures. This would provide bicycling and pedestrian facilities.

Figure 3-9. Barbur Viaducts



Fanno Creek Trail (9014, 9042)

Project Description

Table 3-7. Fanno Creek Trail Estimated Costs (2022)

Project Number	$ M
9014	3.87
9042	0.26
Combined	4.13

Both of the Fanno Creek Trail projects are located within the City of Tigard and both are important to the City. Both Project 9014 and 9042 support all proposed HCT alignments.

Project 9014 would complete gaps along the Fanno Creek multiuse path from the Tualatin River to Tigard Library and from Pacific Hwy-99W to Tigard Street. This section of the Fanno Creek Trail is on the RTP financially constrained list.

Project 9042 would provide a Tigard Street trail connection for the Fanno Creek Trail from North Dakota Street to Tiedeman Street. This project was originally identified in the Tigard Greenway Trails System Master Plan.

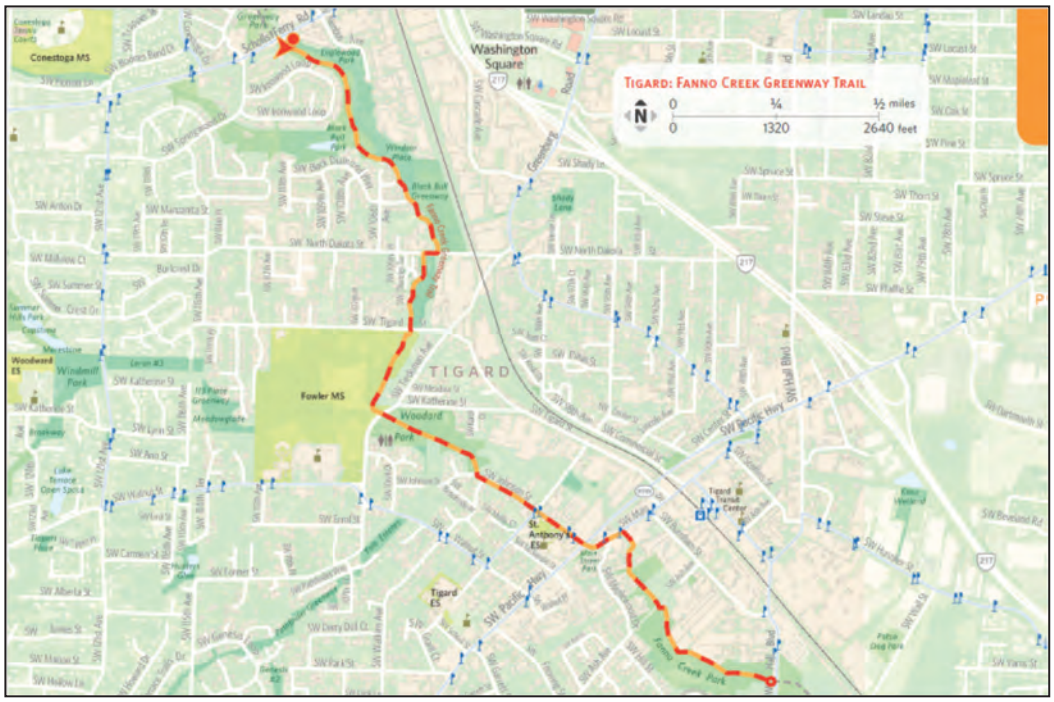
Evaluation

Using Metro's Bike Model, Project 9014 and 9042 project to have 700 bicyclists on their most traveled link each. Both projects provide for increased pedestrian connectivity, with safer access provided to within ¼ (9014) and 1 mile (9042) of an HCT alignment.

Project 9014 provides critical support for the identified land use goals, with a direct connection to Downtown Tigard and improved connections to Bridgeport Village (Essential Key Places). Project 9042 provides low support for the land use goals of this project.

Both projects are identified in the Regional Active Transportation Plan with the functional classifications of Regional Bicycle Parkway and Regional Pedestrian Parkway.

Figure 3-10. Fanno Creek Trail



Barbur Boulevard Separated Bicycle Facilities (3044, 3094)

Project Description

Table 3-8. Boulevard Separated Bicycle Facilities Estimated Costs (2022)

Project Number	$ M
3033	2.13
3094	2.35
Combined	4.48

Both of these projects – 3044 and 3094 – would provide a separated bicycle facility in the Barbur Blvd roadway. The extent of project 3044 is from SW 23rd Ave to SW Capitol Hwy (Barbur Blvd Ramp), and the extent of Project 3094 is from SW Capitol Hwy to SW Sherman Street. Both projects are important to the City of Portland.

Both projects are in Portland and came out of the 2030 Portland Bicycle Plan. The projects provide critical non-motorized connection to all HCT alignments. Project 3094 is related to the Barbur Viaducts projects # 6003, 6004, and 6005. The 2035 Portland Bicycle Plan as well as the draft Regional Active Transportation Plan suggest that some separation between vehicle traffic and bicycles is desirable along Barbur Blvd. This could be accommodated through buffered bike lanes, cycletracks, or a two-way multi-use path parallel to Barbur Blvd, to be determined in project development once the HCT alignment and mode have been determined.

Evaluation

The results from Metro's Bike Model predict 1000 bicyclists on the most traveled link for each project.

Project 3094 provides high support for the identified land use goals, providing improved connections to OHSU and Central City/PSU, both Essential Key Places. Project 3044 has a relatively low support for the land use goals, providing improved connections to Capitol Hill (Priority Key Place)

Both projects are identified with the functional classification of Regional Bicycle Parkway in the *Regional Active Transportation Plan.*

72nd Avenue (2045, 2046)

Project Description

Table 3-9. 72nd Avenue Estimated Costs (2022)

Project Number	$ M
2045	3.23
2046	1.03
Combined	4.26

Projects 2046 and 2046 are both located in Tigard along 72nd Avenue. Project 2045 would complete gaps in the sidewalk network on both sides of the street from Highway 99W to Bonita Road, while project 2046 would install sidewalk on both sides of 72nd Avenue from Upper Boones Ferry Road to Durham Road.

Both of the projects were originally identified in the Tigard TSP, and both are on the RTP financially constrained list.

Project 2045 provides critical non-motorized connections to the72nd/Tigard HCT alignment only, while project 2046 provides critical connections to all proposed HCT alignments.

Evaluation

Both projects would provide safer pedestrian access to within ¼ mile to the identified HCT alignments.

Both 2045 and 2046 provide critical support for the identified land use goals. Project 2045 provides critical connections to Triangle 1 (Essential Key Place) and Triangle 2 (Priority Key Place). Project 2046 provides for improved connectivity to Bridgeport Village (Essential Key Place) and SW Employment (Priority Key Place).

Figure 3-11. 72nd Avenue

PCC Connections (6013, 9053, 6006)

Project Description

Table 3-10. PCC Connections Estimated Costs (2022)

Project Number	$ M
6013	0.32
9053	0.65
6006	1.29
Combined	2.26

All three of the projects (6013/9053/6006) improve access to Portland Community College – Sylvania (PCC). Projects 6013 and 6006 are within Portland, while 9053 is in both Tigard and Portland.

Project 6013 would create a Neighborhood Greenway connection between Barbur and PCC via SW 53rd. This is an important project to Portland. This project provides a critical non-motorized connection to the Barbur LRT HCT alignment.

Project 9053 provides an improved pedestrian/bicycle connection between the Tigard Triangle area and PCC-Sylvania. This project is originally from the Tigard Park System Master Plan, and is important to Tigard. Project 9053 provides critical non-motorized connections to all of the proposed HCT alignments.

Project 6006 is a collection of short pathway connections. The pathways are: SW Lesser Rd - SW 55th & G Street; G St to Mountain Park Trail; 49th to G Street; entrance improvements at 53rd & G Street as well as 49th entrance. These projects all originally came from a TE-OBPAC Grant proposal. These pathway connections provide critical non-motorized connections for the BRT to Tigard, BRT to Tualatin, and BRT to Sherwood HCT alignments.

Evaluation

Both projects would provide safer pedestrian access to within ¼ mile to the identified HCT alignments.

Both 2045 and 2046 provide critical support for the identified land use goals. Project 2045 provides critical connections to Triangle 1 (Essential Key Place) and Triangle 2 (Priority Key Place). Project 2046 provides for improved connectivity to Bridgeport Village (Essential Key Place) and SW Employment (Priority Key Place).

Tigard Transit Center Connections (2076, 2078, 2079, 2080)

Project Description

Table 3-11. Tigard Transit Center Connections Estimated Costs (2022)

Project Number	$ M
2076	0.65
2078	0.13
2079	0.13
2080	0.13
Combined	1.04

All of the projects in this group improve pedestrian connections to Downtown Tigard and the Tigard Transit Center.

Project 2076 would build sidewalks (minimum 10 ft. wide) along OR99W where there are none, and widen existing sidewalk corridors all along OR99W, to accommodate a landscaped buffer between pedestrians and the motor vehicles.

Project 2078 provides a designated pedestrian path through the transit center park and ride lot, connecting to SW Main St. This project is important to TriMet.

Project 2079 would formalize the existing, informal path running from SW Commercial St. to SW Hall Blvd. Improvements would include paving the pathway, making it ADA accessible, providing lighting, and providing wayfinding signage.

Project 2080 would build sidewalks where there are none along SW Scoffins St. & SW Ash St. These streets are near the Tigard Transit Center and provide access to it. The project is important to TriMet.

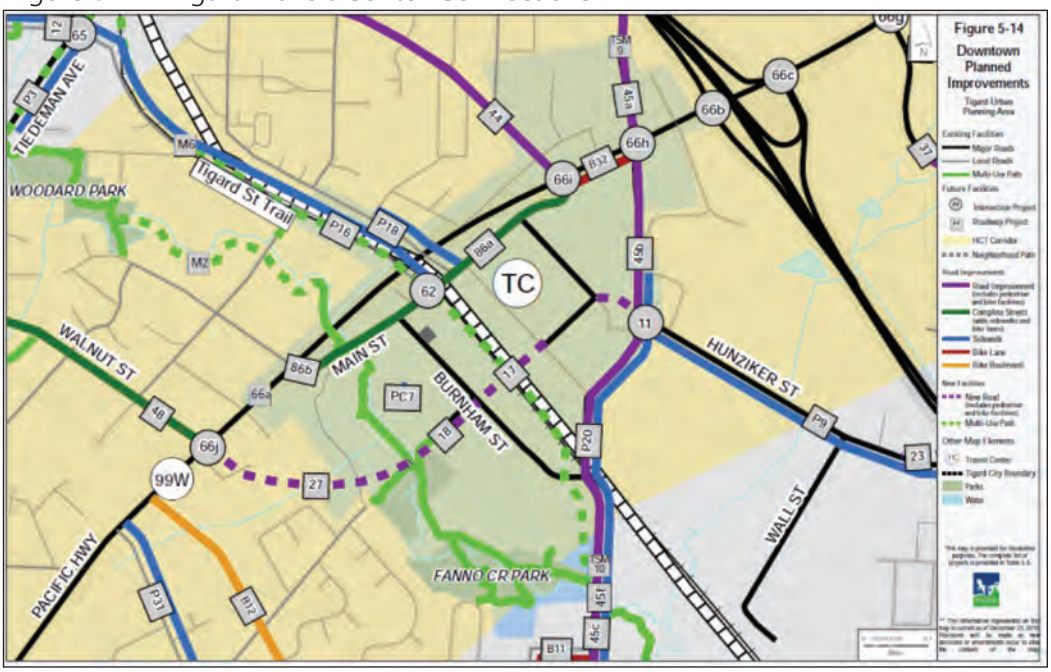
All of the projects came out of TriMet's Pedestrian Analysis Project. All support safer access to all of the proposed HCT alignments.

Evaluation

All of the proposed projects provide improved pedestrian connectivity within ¼ mile access to the proposed HCT alignments.

All projects except # 2076 provide critical support for the land use goals. Project 2076 provides high support for essential or priority land use places. All provide for improved connectivity to Downtown Tigard (Essential Key Place).

Figure 3-12. Tigard Transit Center Connections



King City Town Center Improvements (2001, 2070)

Project Description

Table 3-12. King City Town Center Improvements Estimated Costs (2022)

Project Number	$ M
2001	0.32
2070	0.65
Combined	2.26

Both project 2001 and 2070 provides for improved connectivity to the King City Town Center.

Project 2001 identifies a variety of pedestrian improvements for the King City Town Center. Improvements include new/upgraded sidewalks, lighting, bus shelters and benches, and pedestrian crossings for OR99W. This project is in King City and is important to King City.

Project 2070 identifies OR99W pedestrian improvements to serve King City transit stops. This includes improved pedestrian access and crossing opportunities at transit stops on OR99W in the vicinity of Royalty Parkway in King City and Durham Rd in Tigard. This project is located on the Tigard/King City boundary, and is important to King City.

Both projects provide moderate support for all HCT alignments.

Evaluation

Both projects (2001/2070) improve pedestrian connectivity and safety within a 2 mile radius of all of the HCT alignments. Both projects provide low support for essential or priority land use places.

Sherwood Trails (9003, 9027)

Project Description

Table 3-13. Sherwood Trails Estimated Costs (2022)

Project Number	$ M
9003	1.29
9027	0.26
Combined	1.55

Projects 9003 and 9027 are both located in Sherwood, and provide for improved trail connectivity and crossings. Both projects come out of the Tonquin Trail Master Plan.

Project 9003 is a portion of the Tonquin Trail. This project would construct a multi-use trail with some on-street segments connecting multiple communities in Washington and Clackamas County. This is an important project to the city of Tualatin.

Project 9027 is a portion of the Cedar Creek Trail, which is also part of the Tonquin Trail, and provides for improved pedestrian and bike connection. This is an important project to Sherwood.

Both projects provide critical support for the HCT to Sherwood alignment.

Evaluation

Using Metro's Bike Model, project 9003 anticipates 300 bicyclists on the most traveled link, while project 9027 shows 325 bicyclists on the most traveled link. Both projects increase pedestrian connectivity within 1-mile of the HCT to Sherwood alignment.

Project 9003 and 9027 provide low support for the identified land use goals.

The Tonquin Trial (9003) is identified in the Regional Active Transportation Plan as a Regional Bicycle Parkway and Regional Pedestrian Parkway.