Agenda

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

Meeting:	Southwest Corridor Plan Steering Committee
Date:	Monday, June 11, 2018
Time:	9 to 11 a.m.
Place:	Council Chambers, Metro Regional Center, 600 NE Grand Ave., Portland
Purpose:	Receive summary of environmental impact study, its public review period, and the upcoming decision making process. Update on equitable development strategy.

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9 a.m. Welcome, introductions and partner updates — Co-Chair Dirksen

ACTION ITEM

9:10 a.m. Consideration of the Steering Committee meeting summary From March 12, 2018 ACTION REQUESTED — Co-Chair Dirksen

DISCUSSION ITEMS

9:15 a.m. Draft Environmental Impact Statement (DEIS) overview — Chris Ford, Metro; Dave Unsworth, TriMet
Summary of DEIS, including organization, impacts and mitigations, other information.
Discussion: Questions on the content of the Draft EIS?

10:00 a.m. Preferred Alternative selection process — Chris Ford, Malu Wilkinson, Metro
Overview of Steering Committee action and process for Metro adoption, including timelines and other decisions remaining. Review of longer term project schedule.
Discussion: Questions on the Preferred Alternative process and other decisions?

10:15 a.m. DEIS public review period – commenting and activities — Eryn Kehe, Metro
Planned events, ways to comment, how comments will be processed.
Discussion: Questions on the public review period?

10:30 a.m. Equitable Development Strategy update — Brian Harper, Metro
Overview of pilot projects
Discussion: Questions on SWEDS next steps or pilot projects?

PUBLIC COMMENT

10:45 a.m. Public Comment — Co-Chair Dirksen
Opportunity for citizens to provide short testimony and/or submit written comments to inform future Steering Committee decisions.

11:00 a.m. Adjourn

Materials for 6/11/2018 meeting:

- 03/12/2018 meeting summary
- DEIS Executive Summary
- Notification postcard for DEIS and list of DEIS public meetings

Meeting: Southwest Corridor Steering Committee
Date/time: Monday, March 12, 2018
Place: Tigard Town Hall – 13125 SW Hall Boulevard, Tigard

Committee Members Present

Craig Dirksen, Co-chair	Metro Council
John Cook	City of Tigard
Doug Kelsey	TriMet
Alice Cannon*	City of Tualatin
Rian Windsheimer	ODOT
Roy Rogers	Washington County
Art Pearce*	City of Portland
Gery Schirado	City of Durham

**Serving as alternate*

Metro Staff Present
Chris Ford, Yuliya Lee, Michaela Skiles, Malu Wilkinson, Eryn Kehe, Samuel Garcia.

1.0 Welcome and introductions

Co-chair Craig Dirksen called the meeting to order at 9:01 a.m. and welcomed the committee members and public to the meeting. The committee members and committee member alternates proceeded to introduce themselves and noted their jurisdictional affiliation. Co-chair Dirksen welcomed the new member of the committee, Mr. Doug Kelsey, TriMet's General Manager, and reminded the committee that public testimonies will be given at the end of the meeting.

2.0 Consideration of the Steering Committee meeting summary from February 12, 2018

Co-chair Craig Dirksen asked the committee for approval of the meeting summary from February 12, 2018.

Mr. R. A. Fontes voiced concern about the way his public testimony in February was written in the meeting summary. His comments were recorded as: "Mr. R. A. Fontes, Lake Oswego resident, expressed opposition to light rail and voiced his support for Bus Rapid Transit (BRT) and autonomous vehicles." Project staff suggested the wording: "Mr. R. A. Fontes, Lake Oswego resident, expressed opposition to light rail and voiced his support for Bus Rapid Transit (BRT) and expressed concerns regarding the effect of autonomous vehicles on light rail viability."

Co-chair Craig Dirksen asked the committee for approval of the meeting summary with amendments to the Mr. R. A. Fontes testimony. With no other amendments, the meeting summary was accepted unanimously.

3.0 Southwest Corridor upcoming schedule and decision process

Mr. Chris Ford, Metro, started his presentation with a brief overview of the Draft Environmental Impact Statement (DEIS) progress. He stated that the analysis is complete, the Initial Route Proposal (IRP) has been identified and the document is currently under FTA review. He also explained to the committee that the DEIS will be distributed once lead agencies sign on it and the public review period will officially start once it is published in the Federal Register.

Mr. Ford noted that projected DEIS target dates will include:

- May 7 – available, distribution starts (could be sooner)
- May 18 – Notice of Availability (NOA) (could be one week sooner or later)
- July 2 – close of public review (45 days after NOA)

Mr. Ford stated that based on the projected target dates there would be no Southwest Corridor Steering Committee meeting in April, DEIS major findings would be presented on May 14, in June the focus would be on public comment, and then the committee would recommend the locally Preferred Alternative (LPA) in mid-July.

He concluded his presentation with an overview of the project's long term timeline and reviewed the next steps for the LPA which included:

- **Steering Committee action** – takes into account DEIS, public comment, input from staff and CAC
- **Local jurisdiction input** – August-September
- **Metro Council adopts into RTP** - October

4.0 Southwest Equitable Development Strategy update

Ms. Malu Wilkinson, Metro, updated the committee on the Southwest Equitable Development Strategy. She emphasized that with two equitable housing grants the work is getting done as a joint effort with multiple jurisdictions, organizations, and a project oversight committee comprised of various representatives from organizations, businesses, community groups, and educational institutions. Ms. Wilkinson stated that the goal is to allow existing residents to enjoy new developments in addition to avoiding or minimizing displacements.

In addition, Ms. Wilkinson stated that Metro received a grant from Federal Transit Administration (FTA), where one third of the sum is reserved for groups with pilot projects. Currently, Metro received 11 pilot project proposals from community partners, housing groups, business and education groups. Ms. Wilkinson concluded her brief update reminding the committee that timeframe for the pilot projects' completion is summer 2019.

5.0 Public Involvement Updates

Ms. Eryn Kehe, Metro, updated the committee on the current and upcoming public involvement activities. She summarized recent activities which included:

- Momentum Alliance discussion group – February 24
- SW Corridor CAC meetings – March 19 and April 2
- Property owner meetings

Ms. Kehe reviewed plan of actions during the DEIS comment period which included:

- Public hearing
- Convenient public events in each city
- Targeting renters and communities of color at one event
- Mailing early May
- Email and social media outreach
- Local newspaper advertisements
- Local associations/organization visits
- DEIS document (pdf) on website
- Copy available at local libraries
- Handouts to summarize

6.0 Online comment map summary report

Mr. Samuel Garcia, Metro, presented summary of findings from the online comment map report. He gave a brief overview of the report and the snapshot of participation for the comment map summary. Mr. Garcia summarized top considerations for the proposed alignment choices which included:

Naito and Barbur
- Neighborhood benefit
- Traffic concerns
- Riders

Barbur and I-5
- Convenient stations
- Neighborhood benefit
- Riders

Branch and Through
- Riders
- Travel time
- Convenient stations

Downtown Tigard via Ash
- Riders
- Travel time
- Cost to build

Railroad and I-5
- Cost to build
- Private property impacts
- Serves the people who need it most

Mr. Garcia finished his presentation with an overview of conclusions for the proposed alignment choices which included:
- Naito Parkway in South Portland
- Barbur Boulevard in Southwest Portland
- Through system to Downtown Tigard via Ash Alignment
- Railroad option to Bridgeport Village

Commissioner Roy Rogers inquired how much information on costs and alternatives was presented in the survey. Mr. Doug Kelsey asked how information on disruption for each alternative was shared. Mr. Garcia responded that information on costs and impacts was shared. Ms. Eryn Kehe, Metro, added that pros and cons for the each alignment were provided in the survey in order to provide balanced information.

7.0 Draft Environmental Impact Statement (DEIS) document review

Mr. Chris Ford, Metro, started his presentation with a reminder to the committee that the DEIS document will serve as a decision support tool. He stated that it will disclose impacts, evaluate how these impacts differentiate the alternatives, and explained that preferences for the alternatives are value-based for each individual person. Mr. Ford noted that there will be little difference between alternatives or segments in the corridor-wide analysis when looking at issues such as air quality,

energy, geology and soils. However, the analysis will show differences between alternatives within a segment for all other issue areas.

Mr. Ford continued with an overview of DEIS disciplines which included:

Footprint-Based (based on assumed construction footprint)
- Acquisitions, Displacements and Relocations
- Parks and Recreation
- Land Use
- Economics
- Historic and Archaeological
- Hazardous Materials
- Ecosystems
- Water Quality and Hydrology
- Utilities

Operation-Based (based on modeling of light rail operations)
- Transportation
- Noise and Vibration
- Public Services

Location-Based (based on specific location attributes)
- Visual Quality
- Safety and Security

Mr. Ford elaborated on the various aspects of the community impacts, that will be addressed in the DEIS, which included:
- **Cohesion:** Sense of community or social interaction
- **Quality of life:** Aesthetics, noise, vibration, safety and security
- **Community facilities:** Access to these facilities

Mr. Ford stated that to address environmental justice the DEIS will examine impacts after mitigation and benefits to determine if disproportionate adverse effects on low income and minority populations may occur.

Mr. Ford stated that the DEIS would likely find notable variations between light rail alternatives in the follow issue areas:
- Traffic intersection operations
- Residential and commercial displacement
- Effects to parks and historic properties in Portland, especially Lair Hill area
- Noise impacts
- Wetlands and floodplains in Tigard
- Positive and adverse community effects throughout alignment

Mr. Ford concluded with a brief overview of what the Final EIS (FEIS) will include:
- LPA is analyzed in detail
    - Refine the LPA design and update impacts
    - Update data and analysis as needed
    - All other alternatives are dropped
- Refine mitigation and make commitments where possible
    - Analyze the impacts of the mitigations
- Correct errors or omissions in the DEIS
- Respond to comments on the DEIS

Co-chair Dirksen commended project staff for the DEIS summary, noted it was well organized and condensed. The committee members inquired about which traffic analysis was used in the report and if the report will have information on additional potential improvements. Mr. Ford responded that for the traffic analysis assumptions were made for year 2035, and that the report will include information on all potential improvements in the alignment segments. Mr. Art Pearce noted and Mr. Chris Ford confirmed that information on potential improvements will help pursue additional federal funds.

8.0 Initial route proposal

Mr. Chris Ford, Metro, started his presentation with a short overview of what the Initial Route Proposal is and its relationship to DEIS, including:

- Requirement of the Federal Transit Administration (FTA)
- Initial partner staff suggestion for the light rail route
- What is presented today will be published this spring in the DEIS
- NOT the locally Preferred Alternative

Mr. Ford explained that sharing the initial route information now will allow more time for consideration and input by Steering Committee, Community Advisory Committee and the public.

Mr. Dave Unsworth, TriMet, continued the presentation with an overview of the design modifications that are introduced:

- DEIS froze designs for analysis but
- Potential design modifications to those frozen designs suggested for initial route proposal
- Modifications address adverse effects
    - Residential and business displacements
    - Construction impacts
    - Excessive capital cost
- FEIS will study impacts caused by any modifications carried forward

Mr. Unsworth summarized the Initial Route Proposal and elaborated on each segment of the alignment with an overview of proposed modifications. The proposal included:

Overall route – Through route

South Portland – Barbur

- Suggested modifications – avoid Barbur viaducts
    - Reduce construction impacts
    - Avoid historic and park impacts
    - Reduce cost

Hillsdale to Tigard Triangle – In Barbur to Barbur TC, then adjacent to I-5

- Suggested modifications – shorten I-5 crossings
    - Reduce visual impacts
    - Reduce construction impacts
    - Reduce cost
    - Allows for a station on 68th Ave near 99W

Tigard Triangle and Downtown Tigard – Ash

- Suggested modifications – Elmhurst and Downtown station east of Hall Boulevard
    - **Elmhurst:** avoid business impacts on Beveland Street

- **Downtown station:** avoid residential impacts on Ash Avenue and Hall Boulevard, avoid crossing Hall Boulevard twice

Downtown Tigard to Bridgeport – Railroad

Mr. Chris Ford concluded the presentation with the next steps after the release of the DEIS which included:

- Input on the DEIS (initial route, impacts, mitigations)
  - CAC recommendation on locally Preferred Alternative
  - Staff input
  - Public and agency comments on DEIS
- Steering Committee recommends locally Preferred Alternative [July]
- Input from local jurisdictions and JPACT [August-October]
- Metro Council adopts locally Preferred Alternative [October]

Mr. Unsworth reminded the committee that information presented in the DEIS mostly focuses on the impacts, therefore, he noted the importance of remembering that the project goals are to connect jobs, educational opportunities, places and communities. Mayor Gery Schirado inquired about the difference between the initial route proposal and the information in the DEIS. Mr. Unsworth responded that the DEIS might have updated information on alignments which might help to select a better route. Mayor Gery Schirado asked for a tour of the proposed route with a commentary from TriMet explaining all the modifications to each alignment choices.

9.0 Public Comment

Mr. R. A. Fontes, Lake Oswego resident, thanked Mayor Lou Ogden and co-chair Stacey for voicing his concerns after his public comment at the Steering Committee meeting on February 12, 2018. He thanked project's staff for timely response addressing those concerns. Mr. Fontes gave a brief update on AV's, transit cost comparison, and comments. Document was provided and included as part of the meeting record.

Mr. Roger Averbeck, Oregon Walks and SW Corridor CAC liaison, thanked project staff for updates on public outreach and comment map tool. He urged the committee to review project's purpose and need to guide their decision on LPA. He also requested additional information on project's benefits.

10.0 Adjourn

There being no further business, Co-chair Craig Dirksen adjourned the meeting at 10:34 a.m.

Attachments to the Record:

Item	Type	Document Date	Description	Document Number
1	Agenda	03/12/18	Meeting agenda	031218SWCSC-01
2	Summary	02/12/18	2/12/18 meeting summary	031218SWCSC-02
3	Document	January 2018	Southwest Corridor Public Comment Map Summary Report	031218SWCSC-03
4	Document	March 2018	Light rail options: initial route proposal	031218SWCSC-04
5	Document	03/12/2018	Updates: AV, Transit Cost Comparison, and Comments	031218SWCSC-05

March 2018

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SW Corridor Light Rail Project

Light rail options: initial route proposal

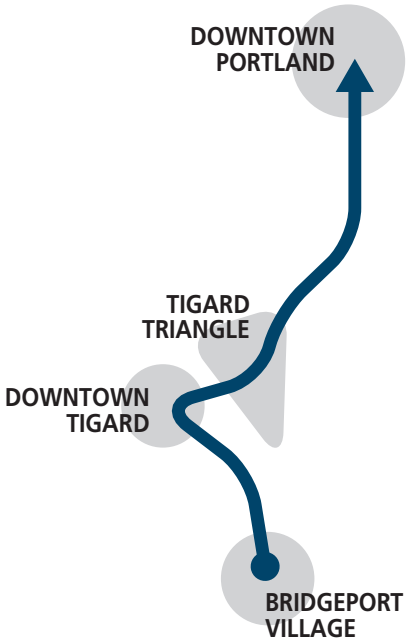
For many years, we've been talking about how to improve transportation in the Southwest Corridor, one of the fastest growing parts of our region. The corridor stretches between downtown Portland, Tigard and Tualatin. It is time to share a proposed route for a future MAX light rail line that could connect these communities and see what people think is the best route for our region.

The Southwest Corridor Project will publish a Draft Environmental Impact Statement (DEIS) for public review and comment this spring. The DEIS is a study that shares the impacts and benefits of route options for a 12-mile light rail line in the corridor. The report is required for the project to qualify for federal funding from the Federal Transit Administration (FTA). FTA also requires the study include an initial route proposal for comment.

The proposed route was developed by partner staff with information from the DEIS process and previous public feedback.

Several factors drove staff discussions about the route:

- minimizing impacts to housing and businesses, as much as possible
- improving transit travel time
- station proximity to destinations for future riders (employment, health facilities, homes)
- safety for all modes of travel
- efficient and cost-effective transit operations



What's next

The DEIS release is scheduled for this spring, to be followed by a 45-day public comment period. The initial route proposal is one combination of options studied in the DEIS, but it is not the final choice. The Steering Committee can choose a different combination when they recommend a Preferred Alternative after the comment period.

Southwest Corridor Steering Committee members are leaders from Metro, TriMet, Oregon Department of Transportation (ODOT), Washington County, and the cities of Beaverton, Durham, King City, Portland, Tigard, Tualatin and Sherwood.

Learn more...

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swcorridorplan@oregonmetro.gov

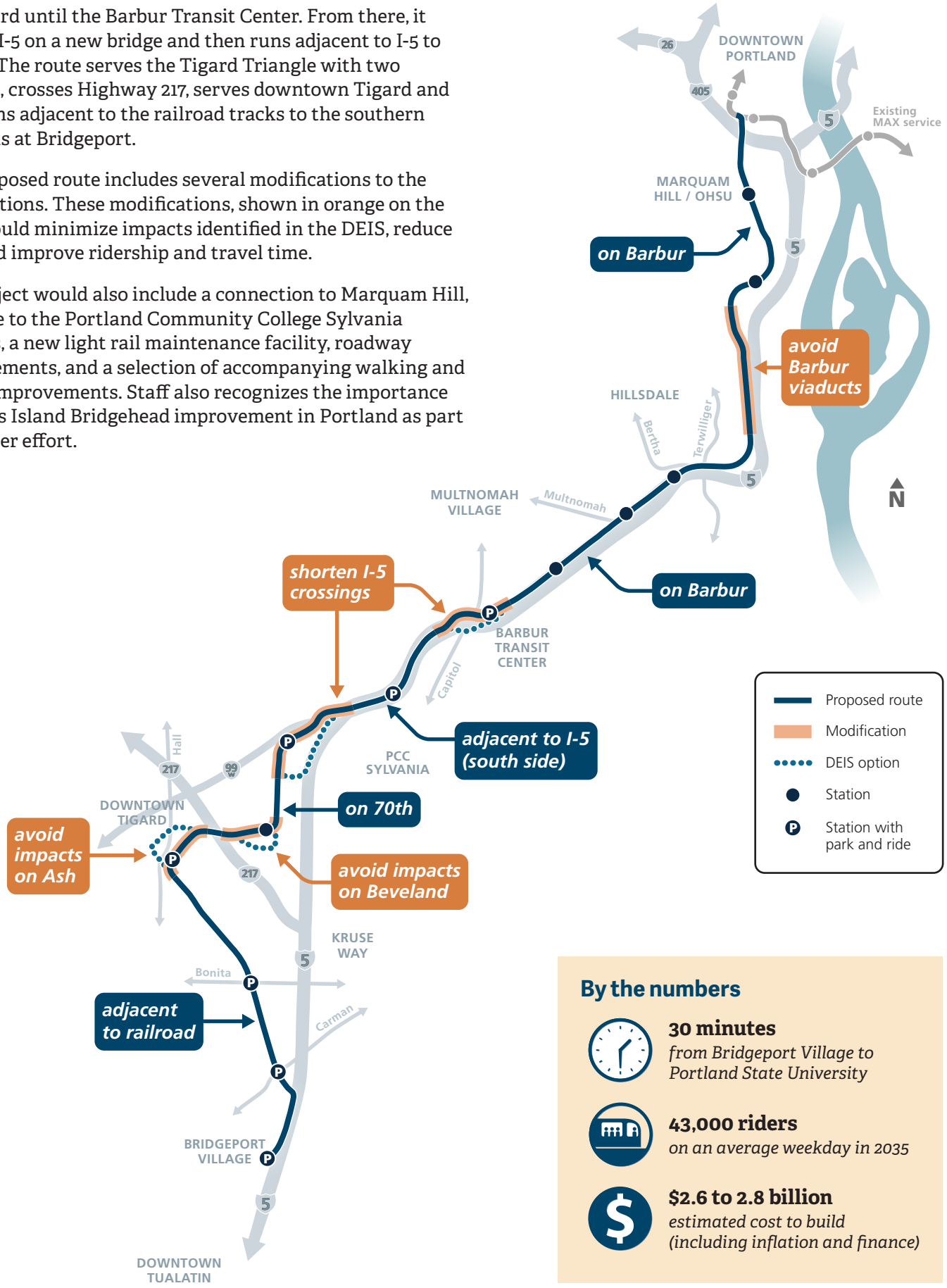
The initial route proposal

March 2018

The initial route proposal is shown in blue on the map. The route travels south from the Portland Transit Mall on Barbur Boulevard until the Barbur Transit Center. From there, it crosses I-5 on a new bridge and then runs adjacent to I-5 to Tigard. The route serves the Tigard Triangle with two stations, crosses Highway 217, serves downtown Tigard and then runs adjacent to the railroad tracks to the southern terminus at Bridgeport.

The proposed route includes several modifications to the DEIS options. These modifications, shown in orange on the map, would minimize impacts identified in the DEIS, reduce cost, and improve ridership and travel time.

The project would also include a connection to Marquam Hill, a shuttle to the Portland Community College Sylvania Campus, a new light rail maintenance facility, roadway improvements, and a selection of accompanying walking and biking improvements. Staff also recognizes the importance of a Ross Island Bridgehead improvement in Portland as part of a larger effort.



By the numbers

30 minutes
from Bridgeport Village to Portland State University

43,000 riders
on an average weekday in 2035

$2.6 to 2.8 billion
estimated cost to build (including inflation and finance)

Updates: AV, Transit Cost Comparison, and Comments

R A Fontes rfontes@Q.com

First, thanks to Mayor Ogden, Co-chair Stacey, and Metro staff for the quick and extensive response.
Thanks to staff for pointing out the international use of extra lanes in BRT station areas to enable express buses. Station bypass capability is critical to get all of BRT's advantages, but there are possible alternatives to extra lanes. Thanks, too, for accepting some of the discrepancies (example: low-balling LRT ops costs) and for explaining why they exist. More later.

AVs continue to make significant progress.
Arizona authorized Waymo to charge customers for using on-demand AVs without backup safety drivers. Waymo plans to start collecting fares before the end of the year. Next month, California will permit testing of AVs without backup drivers. Separately, the Bishop Ranch autonomous shuttle buses east of Oakland also start in April. Oregon's legislature passed HB 4063, mandating that a special task force present AV recommendations before the next regular legislative session.

A University of California at Davis team released a report a few months ago studying impacts of ride-hailing services. One finding was that these services result in a 6% net reduction of transit use. These companies typically offer fares around $2 or more per mile. Analysts from organizations such as UBS and Columbia University's Earth Institute believe that shared AV costs will drop well below $1 per mile. What happens to transit after AV ride-hailing becomes available?

You'll Find an Update of the MAX/BRT Cost Comparison with Fall 2017 Data on the Third Page.
The key to understanding the chart is that, at current operational levels, MAX trains cost at least three times as much as BRT buses would cost. So, MAX could be cost effective if they carry at least three times as many riders through the lines' individual Maximum Load Sections as TriMet would schedule on BRT. They don't. It's that simple.

Back to Staff's Response:
Each and every discrepancy is real and remains uncorrected, even where acknowledged. Rather than waste time picking every single nit in the response, let's just consider two factually incorrect items. The first, by itself, is unimportant. It's the third response on the second page: "Southwest Corridor projections are for the year 2035, over 20 years from now." The only problem is that it got through; that no one caught and corrected it before submission to the Committee. Quality control just isn't all that important. While this error is obvious to all, how many more got through that are not so glaring?

The second is the claim that LRT vehicle capacity is 266. Various capacity measurements are used by transit. TriMet uses Crush Load, Capacity, and Scheduled Load. The first and last are defined in the Transit Capacity and Quality of Service Manual. Simplifying: Crush Load - you can't squeeze another rider into the vehicle, Capacity - you can squeeze in another, but it would be unduly uncomfortable & the schedule would suffer, and Scheduled Load - that fraction of capacity that, considering normal variation, TriMet feels will maximize loads while rarely going over capacity. The next page shows relative Crush Load and Capacity from Portland's Streetcar Concept Plan. Streetcar and 60' bus metrics are similar.

There are several problems: The nomenclature error got into the analysis, generating a double standard with Scheduled Load for LRT and Capacity for BRT. Staff apparently did not use the opportunity of last month's discrepancy list to check its work, instead choosing to circle the wagons.

Staff's overall response shows that it sees TriMet's limits on buses as absolute ceilings and not challenges. As explained earlier, the mall poses little difficulty. A three minute limit off the mall is really a matter of how many buses can be served by a single loading area within a station. The loss of signal priority is not a great problem if station bypass capability is available. Staff simply refuses even to try to get the most out of bus systems and we all lose, especially riders.

TriMet, encouraged by Metro and others, has put a lot of its eggs into rail baskets. It hasn't worked out all that well. Fares and per capita taxes have increased faster than inflation while per capita ridership has gone down and bus services lag. Rail transit's relatively high fixed operating costs and recurring need for capital replacement, renewal, and upgrades will only be more burdensome once AVs arrrive. Getting out from under WES and streetcar subsidy burdens is one thing; light rail is another and could easily sink TriMet. We just don't need one more expensive underperforming light rail extension.

Bad analysis, insufficient ridership, and autonomous technology. Nothing's changed.

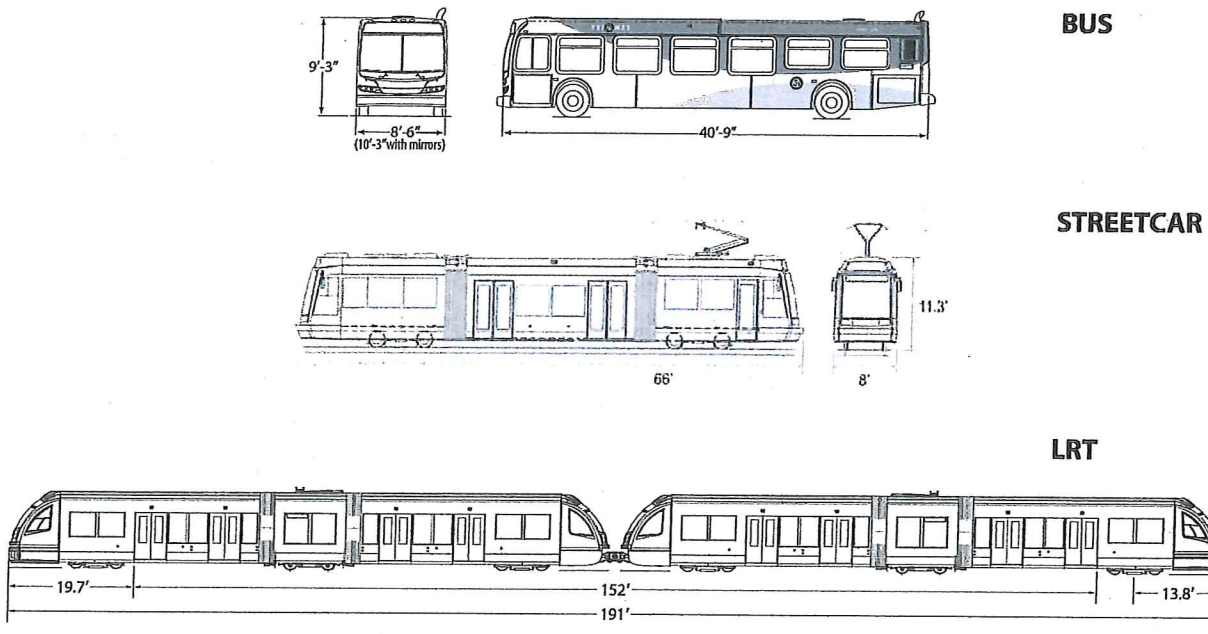
At-A-Glance: Streetcar - LRT - Bus Operational Characteristics

Streetcar, bus and light rail are the primary transit vehicles operating in Portland. The table below, which compares the operational characteristics of the three modes, illustrates streetcar's unique ability to combine the benefits of bus and light rail.

Table 2. Operational Characteristics of Three Modes

	Portland Transit Vehicle Type		
	Streetcar	**Type 4 Light Rail Vehicle (LRT)**	**Bus (Low Floor)**
Vehicle Length	66 feet long 8 feet wide	95 feet long 8.7 feet wide	40 feet long 8.5 feet wide
Power Source	Overhead wire	Overhead wire	Diesel engine
Passenger Entry	Partial low floors, Doors on both sides	Partial low floors, Doors on both sides	Partial low floors, Door on one side
Passenger Boarding	Convenient and accessible boarding	Convenient and accessible boarding	Convenient and accessible boarding
Passenger Capacity	30 seats 51 standees 81 total 110 total "crush design"*	68 seats 104 standees 172 per 1-car train (344 per 2-car train) 448 total "crush design"*	39 seats 12 standees 51 total 64 total "crush design"*
Amenities	Space for wheelchairs, bikes, strollers, etc.	Space for wheelchairs, bikes, strollers, etc.	Space for wheelchairs and bikes
Expected Vehicle Lifespan	30 years	30–35 years	15 years
Cost per Vehicle	$3.5 million	$4.4 million	$430,000
	* or total "design crush load"		

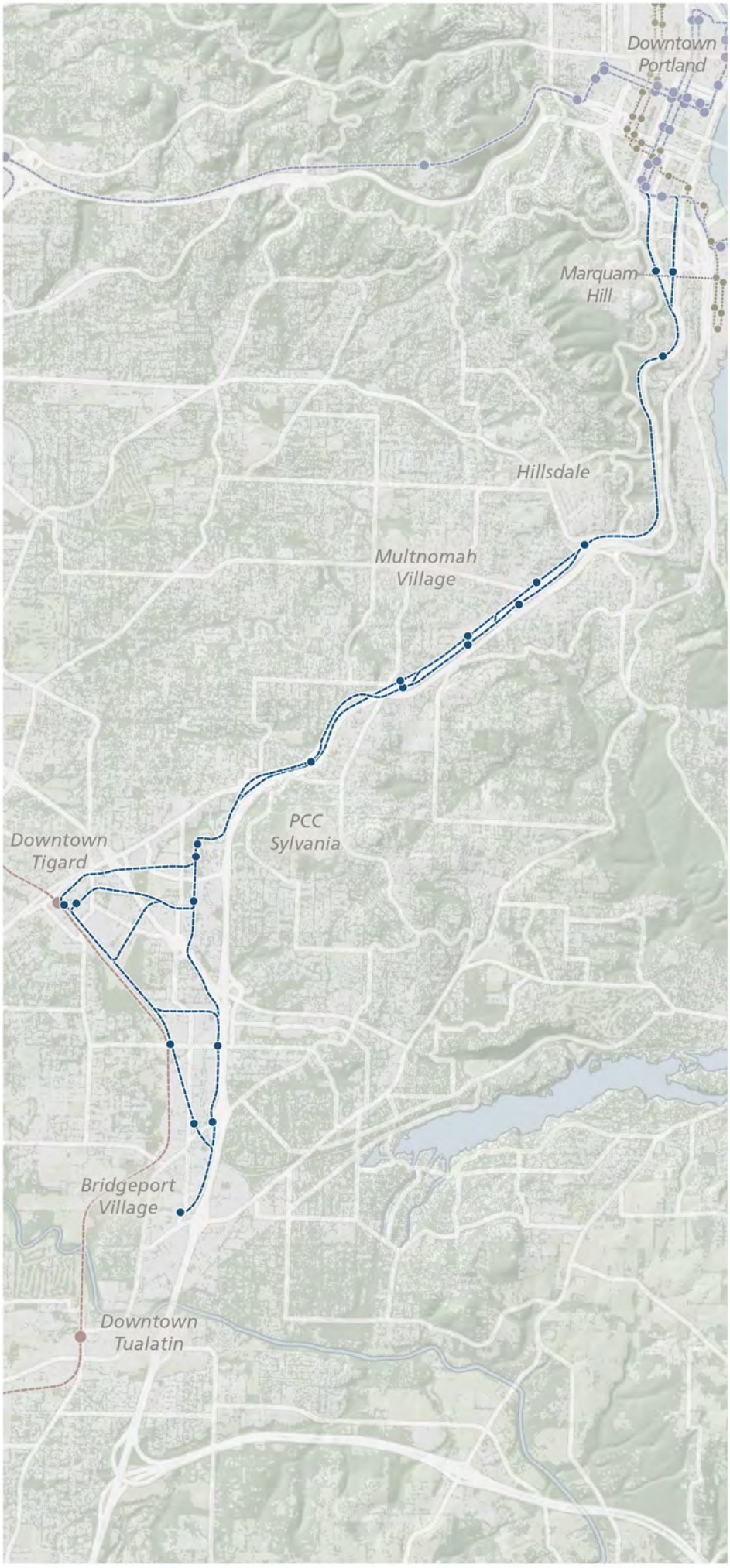
Figure 4. Portland transit vehicle types.



LRT v. BRT Operating Costs Fall 2017: Hard LRT Data Plus Good Faith BRT Estimates

Day	A Peak Direction Start of Maximum Load Section (MLS)	B Daily Total Rides	C Daily Peak Direction MLS Rides	D Daily LRT Runs	E LRT Cost per Ride ($)	F (B x E) Daily LRT Cost ($)	G Daily BRT Runs	H Daily BRT Cost ($)	I Days	J ((F-H)xI) LRT Extra Operating Cost ($)	K Daily Light Direction MLS Rides	L LRT % of Capacity	M BRT % of Capacity
M-F	E - Washington Park	55,630	8,788	184	2.46	136,850	342	84,788	255	13,275,810	7,926	26.8	56.8
Sat	E - Washington Park	37,090	4,990	150	3.12	115,721	194	49,889	53	3,489,096	4,624	18.9	57.6
Sun	E - Washington Park	28,570	3,747	130	3.54	101,138	146	37,862	57	3,606,732	3,726	17.0	59.5
M-F	W - NE 60th	21,250	4,588	143	2.55	54,188	178	22,484	255	8,084,520	4,041	17.8	56.4
Sat	W - SE Division	12,600	2,626	118	3.50	44,100	118	14,700	53	1,558,200	2,278	12.3	48.3
Sun	W - SE Main	10,310	2,077	112	4.15	42,787	112	14,262	57	1,625,925	1,805	10.2	40.3
M-F	S - Albina	25,560	4,462	148	2.69	68,756	174	26,945	255	10,661,805	4,447	17.8	59.5
Sat	S - Albina	14,880	2,977	140	4.19	62,347	140	20,782	53	2,202,945	2,918	12.4	49.0
Sun	N - Rose Quarter	11,940	2,386	130	4.89	58,387	130	19,462	57	2,218,725	2,356	10.8	42.4
M-F	W - Convention Center	20,690	4,307	124	2.65	54,829	168	24,761	255	7,667,340	3,514	18.6	54.1
Sat	W - Convention Center	17,030	3,696	122	3.13	53,304	144	20,972	53	1,713,596	3,070	16.4	54.6
Sun	W - Convention Center	14,020	3,134	112	3.51	49,210	122	17,868	57	1,786,494	2,757	15.5	56.1
					ANNUALIZED LRT EXTRA OPERATING COST:					$57,891,188	WEIGHTED AVERAGE:	19.0%	55.6%

Columns **A & C** are for the higher ridership directions, calculated from Fall 2017 Passenger Census - All Day Ons and Offs by Route and Stop------ **B & E** from Fall 2017 Route Ridership Report (Orange & Yellow costs are weighted averages)--------**D** from October schedule------**G** Assumes that TriMet would aim to schedule loading at 60% of capacity, or 51.6 riders. Since (C) [daily MLS rides] is calculated in peak direction, that number is doubled (to account for both directions) and then divided by 51.6 to get the required number of BRT runs. This number would be raised, if necessary, to equal the number of LRT runs to maintain high frequency minimums on low ridership (usually weekend) days. Finally, the answer is rounded up to the next even number, if necessary.--------**H** (F) [LRT daily cost] is divided by (D) [number of LRT runs] to get cost per train. This quotient is divided by 3 to approximate the cost of BRT. (Hybrid diesel electric or battery electric would bring down BRT costs even more) This second quotient is multiplied by (G) [number of BRT runs]------**I** is the number of category days in an average year, adjusted for holiday schedules.-------**L & M** are the total number of MLS riders in both directions divided by the respective number of LRT or BRT runs, as appropriate, with the quotient divided by average vehicle capacity or 339 in the case of LRT and 86 for BRT.



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SW Corridor Light Rail Project

Southwest Corridor Light Rail Project

Draft Environmental Impact Statement

Summary

June 2018

Metro

TRIMET

U.S. Department of Transportation
Federal Transit Administration

SOUTHWEST CORRIDOR LIGHT RAIL PROJECT

MULTNOMAH AND WASHINGTON COUNTIES, OREGON

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Prepared pursuant to the National Environmental Policy Act

42 U.S.C. 4321 to 4370e

By the

FEDERAL TRANSIT ADMINISTRATION

METRO

TRI-COUNTY METROPOLITAN TRANSPORTATION DISTRICT OF OREGON (TRIMET)

In cooperation with the

FEDERAL HIGHWAY ADMINISTRATION

25 May 2018
Date of Approval

Linda M. Gehrke
Linda M. Gehrke, Regional Administrator
For the Federal Transit Administration

May 29 2018
Date of Approval

Martha Bennett, Chief Operating Officer
For Metro

May 30 2018
Date of Approval

Doug Kelsey, General Manager
For TriMet

The following persons may be contacted for further information about this document:

Mark Assam**,** Environmental Protection Specialist
Federal Transit Administration Region 10
Jackson Federal Building, Suite 3142
915 Second Avenue
Seattle, WA 98174
(206) 220-7954

Chris Ford, Project Manager
Metro
600 NE Grand Avenue
Portland, OR 97232
(503) 797-1700

or

David Unsworth, Project Development Director
TriMet
1800 SW 1st Avenue
Portland, OR 97201
(503) 962-2150

Metro, the regional government and municipal planning organization for the Portland, Oregon region, and TriMet, the area's mass transit provider, are the project sponsors of the Southwest Corridor Light Rail Project (LRT Project), a proposed MAX light rail line serving SW Portland, Tigard, Tualatin and the surrounding communities. The project proposal is to construct and operate 12 miles of light rail transit and related facilities between downtown Portland, Oregon in Multnomah County to the cities of Tigard and Tualatin in Washington County. The Draft Environmental Impact Statement (EIS) examines a No-Build Alternative, which is compared to light rail alternatives and related facilities and options. In addition to the light rail alignment alternatives with up to 13 stations, the proposed project facilities include a new operations and maintenance base, a shared transitway, up to seven park-and-rides, bicycle and pedestrian facilities, a transit shuttle, and a new pedestrian connection to the Oregon Health Sciences University on Marquam Hill. The Draft EIS also identifies an Initial Route Proposal, based on the alternatives under consideration in the Draft EIS. The Draft EIS describes the impact analysis and potential mitigation to address long-term, short-term, indirect and cumulative effects on transit service, ridership, accessibility, traffic, regional and local roadways, freight movements, acquisitions and displacements, land use, economics, neighborhoods, visual and aesthetic resources, ecosystems, water quality and hydrology, geology and seismology, air quality, hazardous materials, noise and vibration, energy, hazardous materials, parklands, safety and security, utilities, historic and cultural resources, and public services. After the publication of the DEIS, a 45-day public review and comment period will follow. The Metro Council will then identify a Preferred Alternative for the Final EIS. Following the publication of a Final EIS, the Federal Transit Administration (FTA) will issue a Record of Decision.

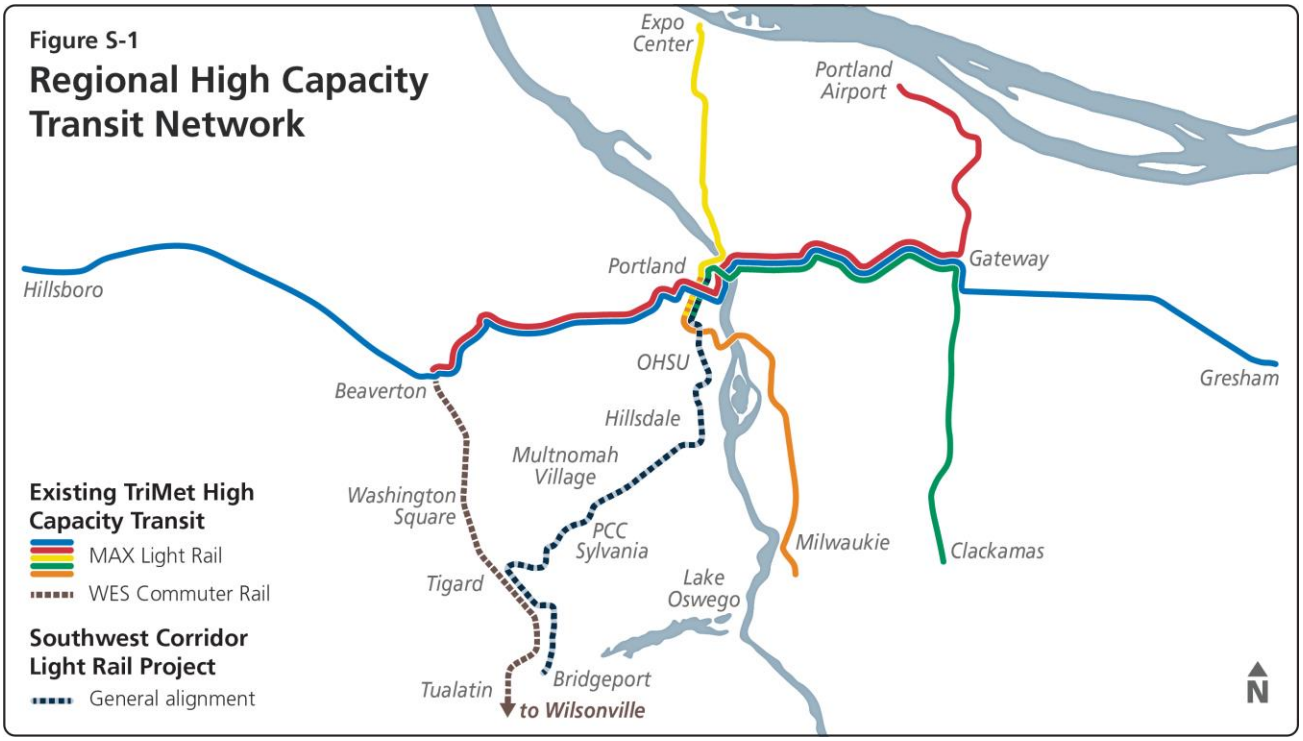
Reviewers should provide their comments to Metro during the comment period of the Draft EIS. During that period, Metro and TriMet will hold a public hearing to provide the opportunity for comment on this document; see the project website at www.swcorridorplan.org for the time and location of the public hearings. Metro will analyze and respond to comments and will use the information acquired in the preparation of the Final EIS. Comments on the Draft EIS should be specific and should address the adequacy of the statement and the merits of the alternatives discussed.

S. SUMMARY

S.1 Southwest Corridor Light Rail Project

The Southwest Corridor Light Rail Project is a proposed new 12-mile Metropolitan Area Express (MAX) line from downtown Portland through Tigard, terminating near Bridgeport Village in Tualatin. The new line would be a major new spoke in the Regional High Capacity Transit Network (see Figure S-1). It would extend the existing MAX Green Line, continuing south from the Green Line's current terminus at Portland State University (PSU) and the Downtown Portland Transit Mall. The project would serve a broader north/south travel corridor generally along Interstate 5 (I-5) and Pacific Highway (99W)/SW Barbur Boulevard from southwest Portland to Sherwood, as well as communities to the east and west.

Figure S-1
Regional High Capacity Transit Network



The proposed project would feature:

- **Light rail trackway:** a 12-mile light rail line between downtown Portland and Tualatin via Tigard, which would primarily run at grade but may include up to 2.6 miles of elevated trackway or bridges and up to four cut-and-cover undercrossings
- **Stations and park and rides:** up to 13 light rail stations with platforms up to 200 feet long, including up to seven park and rides with up to 4,200 spaces total, and with two relocated or reconfigured transit centers and tail tracks or third tracks at terminus stations

- **Light rail vehicles:** up to 32 light rail vehicles added to the Tri-County Metropolitan Transportation District of Oregon (TriMet) fleet that would operate in two-car train sets (16 sets)
- **Light rail service:** service frequencies ranging from 7 to 15 minutes in 2035, depending on location along alignment and time of day
- **Bus routing changes:** elimination or modification of bus routes to improve coverage and service levels and avoid duplicating light rail service (service hours reallocated throughout the corridor)
- **Marquam Hill connection:** structures making a new pedestrian connection between SW Barbur Boulevard and Oregon Health & Science University (OHSU) on Marquam Hill
- **Shared transitway:** up to 2 miles of paved light rail transitway in South Portland to allow express use by buses to and from downtown
- **PCC-Sylvania shuttle:** shuttle route connecting the Portland Community College (PCC) Sylvania campus with up to two nearby light rail stations, including either five additional 40-foot buses or three van-sized shuttle buses
- **Operations and maintenance facility:** new light rail operations and maintenance (O&M) facility in Tigard with the capacity for up to 42 light rail vehicles (one facility option would have space to add more storage tracks later for up to 60 vehicles total)
- **Roadway modifications:** modifications to roadways along or intersecting the light rail alignment, such as SW Barbur Boulevard, including addition or reconstruction of bicycle lanes and sidewalks along modified roadways
- **Station access improvements:** new walking and bicycling infrastructure, such as sidewalks, bicycle lanes and paths, to improve access to stations
- **Bridgehead Reconfiguration:** modifications to the roads and ramps accessing the west end of the Ross Island Bridge and addition of signalized intersections along SW Naito Parkway (included with a certain alignment alternative)

S.2 Purpose and Need for the Project

Federal environmental regulations for an Environmental Impact Statement (EIS) require a statement of the problems a proposed project is intended to address, along with reasons why the project is needed. The Purpose and Need is used to define the EIS alternatives to be considered, and it guides the Federal Transit Administration (FTA), Metro, TriMet and their local agency partners in other decisions about the project.

The purpose of the Southwest Corridor Light Rail Project is to directly connect Tualatin, downtown Tigard, southwest Portland, and the region's central city with light rail, high quality transit and appropriate community investments in a congested corridor to improve mobility and create the conditions that will allow communities in the corridor to achieve their land use vision. Specifically, the project aims to, within the Southwest Corridor:

- provide light rail transit service that is cost-effective to build and operate with limited local resources
- serve existing transit demand and significant projected growth in ridership resulting from increases in population and employment in the corridor

- improve transit service reliability, frequency and travel times, and provide connections to existing and future transit networks including Westside Express Service (WES) Commuter Rail
- support adopted regional and local plans including the *2040 Growth Concept*, the *Barbur Concept Plan,* the *Tigard Triangle Strategic Plan* and the *Tigard Downtown Vision* to accommodate projected significant growth in population and employment
- complete and enhance multimodal transportation networks to provide safe, convenient and secure access to transit and adjacent land uses
- advance transportation projects that increase active transportation and encourage physical activity
- provide travel options that reduce overall transportation costs
- improve multimodal access to existing jobs, housing and educational opportunities, and foster opportunities for commercial development and a range of housing types adjacent to transit
- ensure benefits and impacts that promote community equity
- advance transportation projects that are sensitive to the environment, improve water and air quality, and help achieve the sustainability goals and measures in applicable state, regional and local plans

A light rail transit project in the Southwest Corridor is needed for the following reasons:

- Transit service to important destinations in the corridor is limited, and unmet demand for transit is increasing due to growth.
- Limited street connectivity and gaps in pedestrian and bicycle facilities create barriers and unsafe conditions for transit access and active transportation.
- Travel is slow and unreliable on congested roadways.
- There are both a limited supply and a limited range of housing options in the Southwest Corridor that have good access to multimodal transportation networks. In addition, jobs and services are not located near residences.
- Regional and local plans call for high capacity transit in the corridor to meet local and regional land use goals.
- State, regional and local environmental and sustainability goals require transportation investments to reduce greenhouse gas emissions.

Project Partners

Planning for the project is being led by Metro and TriMet, in partnership with the Oregon Department of Transportation (ODOT), Washington County, and the Cities of Portland, Tigard, Tualatin, Beaverton, Durham, King City and Sherwood. A leadership group of agency officials from the partners (known as the Southwest Corridor Steering Committee) has guided the study of the transit options for the Southwest Corridor since 2011.

This Draft EIS is required by the federal government under the National Environmental Policy Act of 1970 (NEPA). It discloses to decision makers and the public the substantive adverse and beneficial effects of the project and proposes ways to avoid, minimize or mitigate negative impacts. FTA is the lead federal agency for the EIS.

S.3 Alternatives Considered

This Southwest Corridor Light Rail Project Draft EIS considers a No-Build Alternative and several light rail alternatives. The No-Build Alternative represents future conditions without the proposed project. The light rail alternatives represent different ways to complete a 12-mile extension of light rail connecting downtown Portland, Oregon, to southwest Portland, downtown Tigard and Tualatin. The EIS also considers two options for a minimum operable segment (MOS), which is a shorter version of the project that could be constructed as a standalone first phase with logical termini. Exhibit S-1 describes how the light rail alternatives relate to other elements of the Southwest Corridor Plan.

No-Build Alternative

The No-Build Alternative is the baseline for evaluating the benefits and impacts of the light rail alternatives. The No-Build Alternative represents transportation and environmental conditions without light rail to connect Portland, Tigard and Tualatin, and without the accompanying roadway, bicycle and pedestrian access improvements. It assumes regionally adopted forecasts for future population and employment growth through the year 2035, as well as adopted land use plans and other transportation investments in the region.

Light Rail Alternatives

Figure S-2 shows a map of the light rail alternatives for the full corridor from Portland to Tualatin. The alignment alternatives serving southwest Portland, Tigard and Tualatin would generally be within existing or new streets, or adjacent to I-5 or railroads. They comprise a total of up to 13 new stations, several with park and rides, as described below by segment. There are also options for a new light rail vehicle O&M facility, transit shuttles, interchange and circulation modifications, and new structures for pedestrians to reach Marquam Hill.

For analysis and comparison purposes, the alternatives are in three geographic segments with multiple alignment alternatives within each segment:

- Segment A: Inner Portland
- Segment B: Outer Portland
- Segment C: Tigard and Tualatin

Exhibit S-1

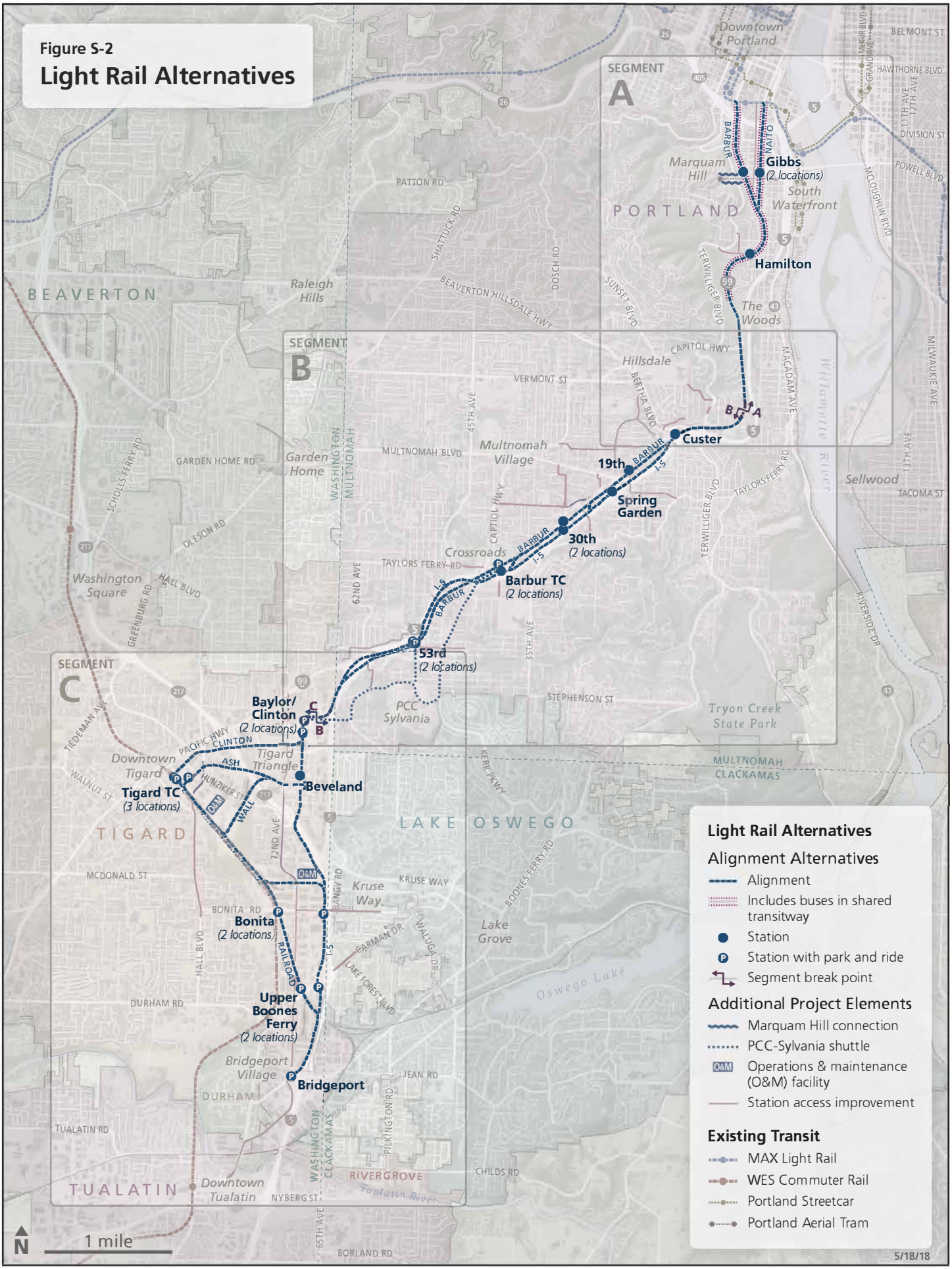
How does the Southwest Corridor Light Rail Project relate to other Southwest Corridor Plan efforts?

The project is a major component of a broader regional effort known as the Southwest Corridor Plan, which calls for strategic investments in this fast-growing part of the Portland region. The Southwest Corridor Plan includes complementary actions to support a successful light rail project. Those initiatives are not evaluated in this Draft EIS, since they are separate projects.

The Southwest Corridor regional partners are working together to support housing, business and workforce needs by making local bus service enhancements, investing in pedestrian and bicycle facilities and regional roadways, and pursuing desired development outcomes. One example is the Ross Island Bridgehead Reconfiguration, which addresses the need to improve multimodal access in the area between Interstate 405, U.S. 26 and the Ross Island Bridge, including changes to SW Naito Parkway; that project is incorporated in one of the segment A alternatives, but could be done separately with another. The Southwest Corridor Equitable Development Strategy (supported by a Corridor-Based Transit-Oriented Development Grant from FTA) is an additional plan component, which will define actions to ensure that individuals and families can continue to live, work and thrive in the Southwest Corridor and are able to take advantage of the increased opportunities that come with the light rail project. See www.swcorridorplan.org for more details.

Figure S-2

Light Rail Alternatives



Summary Details of the Light Rail Project

As shown in Table S-1, a complete, full-corridor project would be made up of one **alignment alternative** for each segment, and it would have a new O&M facility.

Each segment includes **options** that are analyzed separately from the alignment alternatives in order to aid comparisons based on the impacts of different options. These options also would work with any of the alternatives in a given segment.

The alignment alternatives also would have options for other facilities or **station access improvements** that could be added to increase the mobility benefits of the project. Unless noted otherwise below, these options could be paired with all of the alignment alternatives in a given segment.

Table S-2 lists the key characteristics of the stations that are associated with the light rail alignment alternatives. Further details on the stations and related facilities are in Chapter 2 – Alternatives Considered.

Table S-1. Light Rail Alternatives by Segment

Alignment Alternatives	Additional Project Elements *(pair with all alignment alternatives unless otherwise noted)*
Segment A: Inner Portland	
· Alternative A1: Barbur · Alternative A2-BH: Naito with Bridgehead Reconfiguration · Alternative A2-LA: Naito with Limited Access	***Marquam Hill Connection*** · Connection 1A: Elevator/Bridge and Path · Connection 1B: Elevator/Bridge and Recessed Path · Connection 1C: Elevator/Bridge and Tunnel · Connection 2: Full Tunnel ***Station Access Improvements*** · SA01 through SA03 (see Appendix A for detailed information)
Segment B: Outer Portland	
· Alternative B1: Barbur · Alternative B2: I-5 Barbur TC to 60th · Alternative B3: I-5 26th to 60th · Alternative B4: I-5 Custer to 60th	***PCC-Sylvania Shuttle*** · Barbur TC and Baylor Shuttle · 53rd Shuttle ***Station Access Improvements*** · SA04 through SA23 (see Appendix A for detailed information)
Segment C: Tigard and Tualatin	
Through Route · Alternative C1: Ash to I-5 · Alternative C2: Ash to Railroad · Alternative C3: Clinton to I-5 · Alternative C4: Clinton to Railroad ***Branched Route*** · Alternative C5: Ash and I-5 Branched · Alternative C6: Wall and I-5 Branched	***Operations and Maintenance Facility*** · Hunziker Facility · Through 72nd Facility (pairs with Alternatives C1 and C3) · Branched 72nd Facility (pairs with Alternatives C5 and C6) ***Station Access Improvements*** · SA24 through SA29 (see Appendix A for detailed information)

Note: PCC = Portland Community College; TC = Transit Center.

Table S-2. Station Characteristics

Station Name General Location	Alignment Alternatives	Park and Ride[1]		Other Notable Characteristics
		Spaces	Levels	
Lair Hill				
Gibbs Barbur Station	A1	N/A	N/A	Center platform in roadway median
Gibbs Naito Station	A2-BH, A2-LA	N/A	N/A	Center platform in roadway median
Hamilton				
Hamilton Station	All Segment A	N/A	N/A	Center platform in roadway median
Burlingame				
Custer Station	All Segment B	N/A	N/A	Center platform in roadway median
Capitol Hill				
19th Station	B1, B2, B3	N/A	N/A	Side platforms in roadway median
Spring Garden Station	B4	N/A	N/A	Center platform away from roadway
26th/30th				
30th Barbur Station	B1, B2	N/A	N/A	Staggered side platform (far-side)
30th I-5 Station	B3, B4	N/A	N/A	Center platform away from roadway
Barbur TC				
Barbur TC Barbur Station	B1	825	3	Side platforms away from roadway TC reconfigured
Barbur TC I-5 Station	B2, B3, B4	725	3	Side platforms in roadway median TC reconfigured Pedestrian bridge over I-5 replaced
53rd				
53rd Barbur Station	B1	950	3	Center platform in roadway median Pedestrian bridge over SW Barbur Blvd. added
53rd I-5 Station	B2, B3, B4	950	3	Side platforms next to roadway Pedestrian bridge over SW Barbur Blvd. added
Northern Tigard Triangle (the Tigard Triangle is bounded by I-5, Highway 217 and Pacific Highway)				
Baylor Station	C1, C2, C5, C6	425	3	Center platform in side-running configuration
Clinton Station	C3, C4	425	3	Center platform in side-running configuration
Southern Tigard Triangle[2]				
Beveland Station	C1, C2, C5, C6	N/A	N/A	Center platform in side-running configuration
Tigard TC				
Tigard TC Ash Station	C1, C2, C5	300	3	Side platforms in side-running configuration TC moved to SW Ash Ave. For Alt. C5: tail track to Hunziker O&M facility
Tigard TC Clinton Station	C3, C4	275	3	Center platform away from roadway TC moved south on SW Commercial St.
Tigard TC Wall Station	C6	275	3	Platforms at three tracks away from roadway TC moved south on SW Commercial St.
Bonita				
Bonita I-5 Station	C1, C3, C5, C6	150	surface	Side platforms away from roadway 10- to 20-foot walls north and east of platforms
Bonita Railroad Station	C2, C4	100	surface	Center platform on elevated trackway
Upper Boones Ferry				
Upper Boones Ferry I-5 Station	C1, C3, C5, C6	600	3	Side platforms away from roadway 10- to 20-foot walls north and east of platforms
Upper Boones Ferry Railroad Station	C2, C4	50	surface	Center platform away from roadway
Bridgeport Village				
Bridgeport Station	All Segment C	950	4	Platforms at three tracks away from roadway Pedestrian bridge to P&R over SW LBF Rd.

Note: LBF = Lower Boones Ferry; N/A = not applicable; P&R = park and ride; TC = Transit Center.

[1] Based on the maximum proposed size for each park and ride. Subject to refinement during the Final EIS process.

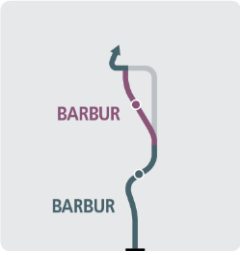
[2] Alternatives C3 and C4 would not include a southern Tigard Triangle station.

Segment A: Inner Portland

Segment A begins at the southern edge of downtown Portland (see Figure S-3) at the south end of the Downtown Portland Transit Mall, with three alignment alternatives that would extend light rail service from SW 5th Avenue and SW Jackson Street, near PSU, to SW Barbur Boulevard just north of SW Brier Place in southwest Portland. The alignments are either continuously along SW Barbur Boulevard, or along SW Naito Parkway and then along SW Barbur Boulevard. All of the alternatives include a 2-mile shared transitway for buses and light rail, starting at SW Barbur Boulevard near SW Capitol Highway, and extending to SW Lincoln Street.

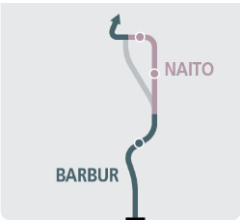
All of the alignment alternatives carry options to build structures providing a new pedestrian connection from SW Barbur Boulevard up to the OHSU Marquam Hill complex. There are three station access improvement options in this segment that involve sidewalks and bicycle lanes.

Alternative A1: Barbur



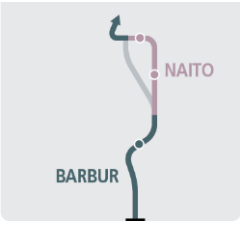
Alternative A1 would run on SW Barbur Boulevard for most of Segment A, primarily operating at grade in the center of the roadway. The light rail alignment for Alternative A1 differs from the other Segment A alignment alternatives between the Transit Mall and the junction of SW Barbur Boulevard and SW Naito Parkway. Stations would be located near SW Gibbs Street and SW Hamilton Street. Both stations would use at-grade center platforms.

Alternative A2-BH: Naito with Bridgehead Reconfiguration



Alternative A2-BH would operate in the center of a widened SW Naito Parkway instead of on SW Barbur Boulevard until about SW Lane Street, where SW Naito Parkway connects to SW Barbur Boulevard. Alternative A2-BH would include stations on SW Naito Parkway at SW Gibbs Street, with an alternate location at SW Hooker Street, and on SW Barbur Boulevard at SW Hamilton Street.

Alternative A2-LA: Naito with Limited Access



Alternative A2-LA would follow the same alignment as Alternative A2-BH, and have the same station locations. As with Alternative A2-BH, it would rebuild SW Naito Parkway to accommodate center-running light rail, but it would not include the Bridgehead Reconfiguration. Instead, Alternative A2-LA would largely maintain SW Naito Parkway's current roadway access restrictions.

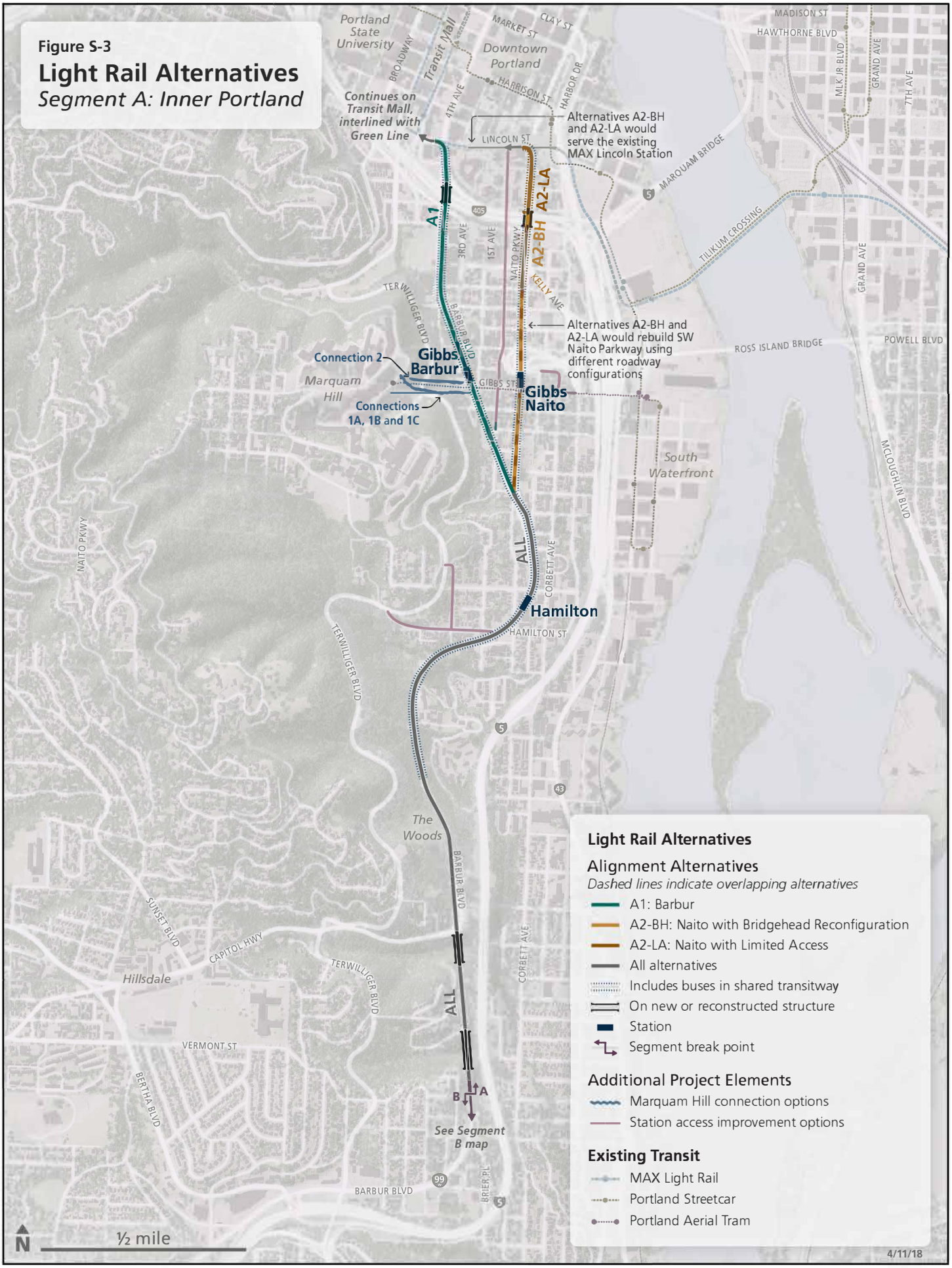
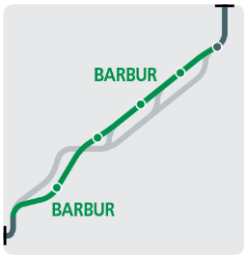


Figure S-3
Light Rail Alternatives
Segment A: Inner Portland
Portland State University
BROADWAY
Transit Mall
MARKET ST
CLAY ST
Downtown Portland
HARRISON ST
HARBOR DR
4TH AVE
Continues on Transit Mall, interlined with Green Line
Alternatives A2-BH and A2-LA would serve the existing MAX Lincoln Station
LINCOLN ST
MADISON ST
HAWTHORNE BLVD
MLK JR BLVD
GRAND AVE
7TH AVE
MARQUAM BRIDGE
A1
A2-BH
A2-LA
405
3RD AVE
1ST AVE
NAITO PKWY
KELLY AVE
TILIKUM CROSSING
GRAND AVE
TERWILLIGER BLVD
BARBUR BLVD
Alternatives A2-BH and A2-LA would rebuild SW Naito Parkway using different roadway configurations
ROSS ISLAND BRIDGE
POWELL BLVD
Connection 2
Gibbs
Barbur
Marquam Hill
GIBBS ST
Gibbs
Naito
Connections 1A, 1B and 1C
South Waterfront
MCLOUGHLIN BLVD
NAITO PKWY
ALL
CORBETT AVE
Hamilton
HAMILTON ST
TERWILLIGER BLVD
5
43
The Woods
BARBUR BLVD
SUNSET BLVD
CAPITOL HWY
Hillsdale
TERWILLIGER BLVD
CORBETT AVE
ALL
VERMONT ST
BERTHA BLVD
B
A
See Segment B map
99W
BARBUR BLVD
BRIER PL
5
N
½ mile
Light Rail Alternatives
Alignment Alternatives
Dashed lines indicate overlapping alternatives
A1: Barbur
A2-BH: Naito with Bridgehead Reconfiguration
A2-LA: Naito with Limited Access
All alternatives
Includes buses in shared transitway
On new or reconstructed structure
Station
Segment break point
Additional Project Elements
Marquam Hill connection options
Station access improvement options
Existing Transit
MAX Light Rail
Portland Streetcar
Portland Aerial Tram
4/11/18

Segment B: Outer Portland

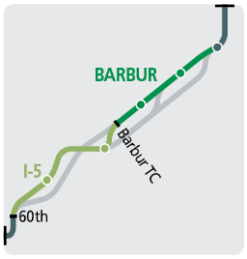
Segment B extends from SW Barbur Boulevard at SW Brier Place to the intersection of SW 68th Parkway and SW Atlanta Street, just west of the Portland/Tigard city boundary (see Figure S-4). The light rail alternatives all have five stations and two park and rides. They all would widen SW Barbur Boulevard to accommodate light rail in the center, but they vary in how long they would stay on SW Barbur Boulevard. One of the alternatives would follow SW Barbur Boulevard through the entire segment, while three would have sections that transition to be adjacent to I-5. Segment B also has two options for a shuttle connection to the PCC-Sylvania campus, as well as 20 options for station access improvements involving sidewalks, bicycle lanes, missing street connections and pedestrian bridges.

Alternative B1: Barbur



Alternative B1 would run in the center of SW Barbur Boulevard until SW 60th Avenue. West of SW 60th Avenue, the alignment would cross back over I-5 between SW Barbur Boulevard and Tigard on a new light rail structure. Stations would be located at grade in the center of SW Barbur Boulevard at SW Custer Street, SW 19th Avenue, SW 30th Avenue, the Barbur Transit Center and SW 53rd Avenue. Three-level park and ride structures would be included at the Barbur Transit Center and 53rd Stations.

Alternative B2: I-5 Barbur Transit Center to 60th

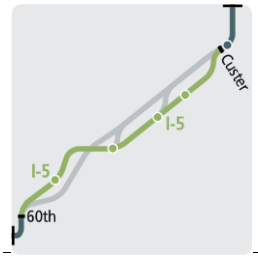


Alternative B2 would be identical to Alternative B1 from SW Brier Place to just north of the Barbur Transit Center, where light rail would transition away from the center of SW Barbur Boulevard to run adjacent to I-5. South of the Barbur Transit Center, the alignment would cross over I-5, SW Capitol Highway and SW Barbur Boulevard on a new light rail structure, and then continue adjacent to I-5 until SW 60th Avenue. West of SW 60th Avenue, the alignment would cross over I-5 and SW Barbur Boulevard on a new bridge. The stations would be the same as Alternative B1 except that the Barbur Transit Center and 53rd Stations would be located next to I-5.

Alternative B3: I-5 26th to 60th

Alternative B3 would be the same as Alternatives B1 and B2 from SW Brier Place to SW 26th Way, where it would shift to run adjacent to I-5. The alignment would depart from SW Barbur Boulevard just north of SW 26th Way and continue south along I-5 to the Barbur Transit Center. The stations would be the same as Alternative B2 except that the 30th Avenue Station would be at grade adjacent to I-5.

Alternative B4: I-5 Custer to 60th

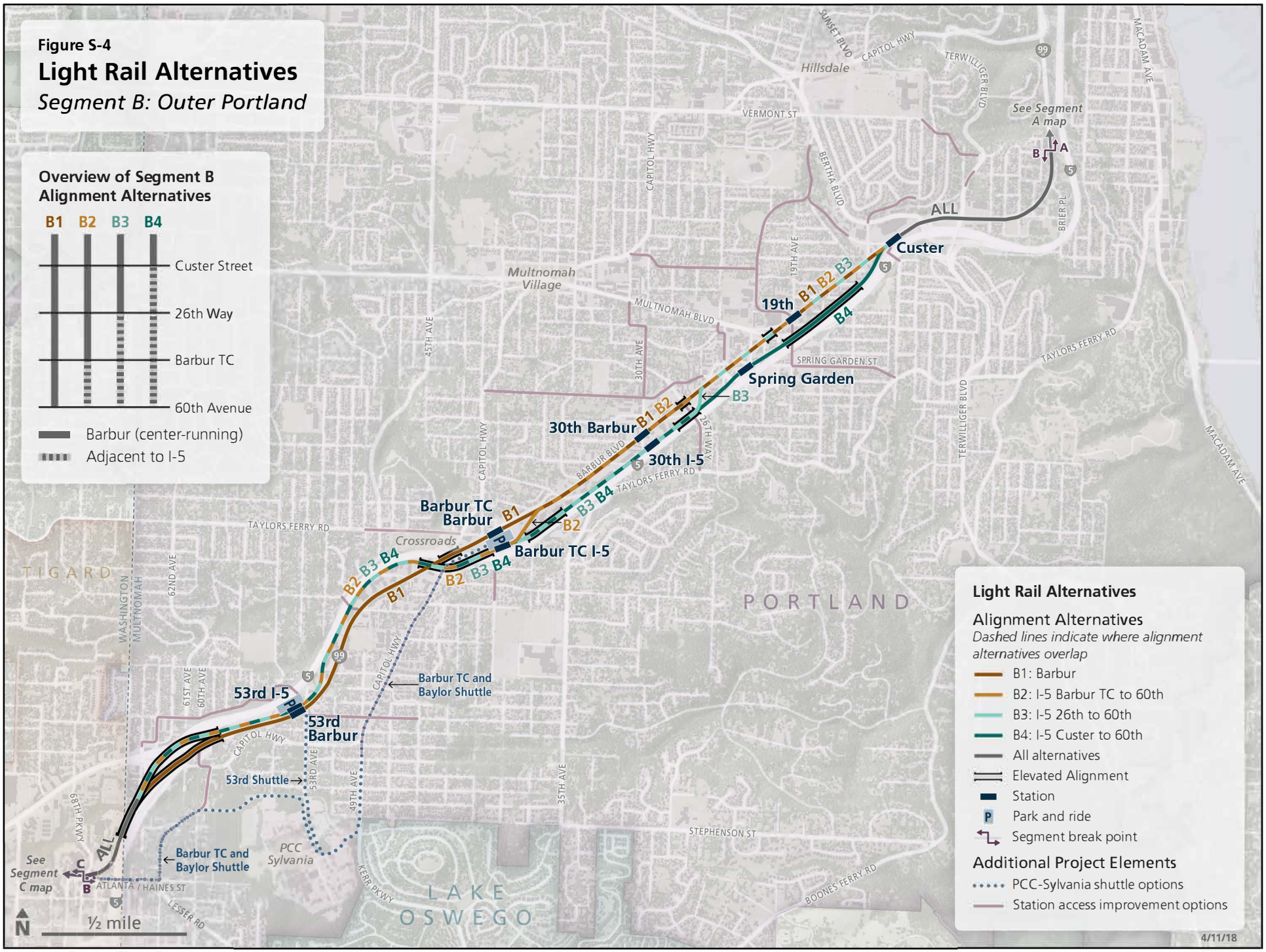


Alternative B4 runs the longest distance adjacent to I-5, starting near SW Barbur Boulevard at SW Custer Street. South of SW 26th Way, Alternative B4 would be identical to Alternative B3. The Custer Station would be the same as in Alternative B1. The 30th, Barbur Transit Center and 53rd Stations would be the same as Alternative B3. The Spring Garden Station would be at grade adjacent to I-5.

Figure S-4

Light Rail Alternatives

Segment B: Outer Portland



Segment C: Tigard and Tualatin

This segment extends from the intersection of SW 68th Parkway and SW Atlanta Street, just west of the Portland/Tigard city boundary, to near Bridgeport Village in Tualatin, which would be the southern terminus of the light rail alignment (see Figures S-5 and S-6). It includes six alternatives with up to six stations, and the alternatives are also grouped by how they would operate. Light rail could run on a continuous "Through Route" serving Tualatin via downtown Tigard, or a "Branched Route," with one branch going to downtown Tigard and the other branch to Tualatin. Segment C has three options for an O&M facility to support light rail operations, and six options for station access improvements for sidewalks, bicycle lanes, missing street connections and pedestrian bridges.

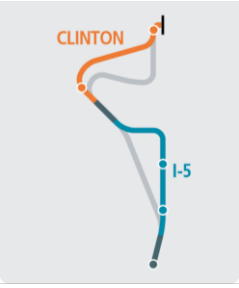
Alternative C1: Ash to I-5

This Through-Routed alignment alternative would be along new and existing streets between the Tigard Triangle (the area bounded by I-5, Highway 217 and Pacific Highway) and downtown Tigard, and then would follow the freight rail and WES tracks before turning east to run along I-5 to Bridgeport Village. It would feature several new bridges, including a crossing over Highway 217 to reach downtown Tigard. There would be two stations in the Tigard Triangle, one with a park and ride; a station in downtown Tigard near a relocated transit center and park and ride; and stations and park and rides along I-5 at SW Bonita Road, SW Upper Boones Ferry Road and Bridgeport Village.

Alternative C2: Ash to Railroad

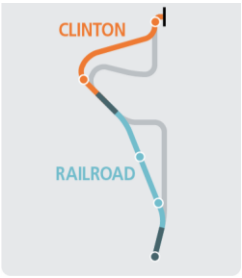
This Through-Routed alignment alternative would be identical to Alternative C1 between the Tigard Triangle and downtown Tigard, including the station locations and park and rides. It then would follow the WES Commuter Rail and freight rail tracks before transitioning to I-5 near SW Upper Boones Ferry Road and continuing to Bridgeport Village. The southern stations and park and rides would be along the freight rail tracks at SW Bonita Road and SW Upper Boones Ferry Road, and along I-5 at Bridgeport Village.

Alternative C3: Clinton to I-5



This Through-Routed alignment alternative would also be mostly along new or existing streets between the Tigard Triangle and downtown Tigard, but the alignment would be to the north of Alternatives C1 and C2 in the Tigard Triangle. Alternative C3 would have one station in the Tigard Triangle and one station in downtown Tigard, both with new park and ride structures. South of downtown Tigard, Alternative C3 would be identical to Alternative C1.

Alternative C4: Clinton to Railroad

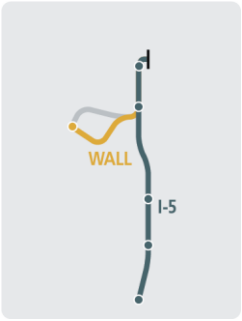


This Through-Routed alignment alternative would use the Alternative C3 alignment between the Tigard Triangle and downtown Tigard, and the Railroad alignment between downtown Tigard and Bridgeport Village. The alignment, station locations and park and rides for this alternative would be identical to Alternative C3 north of and into downtown Tigard and identical to Alternative C2 south of downtown Tigard.

Alternative C5: Ash and I-5 Branched

This Branched alignment alternative would use the Ash alignment for a Tigard branch, and would have a Bridgeport branch that would continue south through the Tigard Triangle to cross Highway 217 and run adjacent to I-5 to reach Bridgeport Village. North of the branch split point, which would be at the Beveland Station, the alternative would be identical to Alternative C1. The Tigard branch alignment to downtown Tigard would be similar to the alignment used for Alternative C1, and the Bridgeport branch alignment would be the same as Alternative C1 south of SW Bonita Road.

Alternative C6: Wall and I-5 Branched



This Branched alignment alternative would be similar to Alternative C5 except that it would connect to SW Wall Street west of Highway 217. At the end of SW Wall Street, the alignment would turn northwest and run parallel to the WES/freight rail tracks to terminate near a reconfigured Tigard Transit Center. The Bridgeport branch would be identical to that of Alternative C5. With the exception of the Tigard Transit Center Station, Alternative C6 would include the same station and park and ride locations as Alternative C1. The Tigard Transit Center Station would be at grade adjacent to the WES station and a reconfigured transit center.

Operations and Maintenance Facility Options

Two locations are being considered for a new light rail O&M facility to serve the corridor. Both are in Segment C. The "Hunziker Facility" option for an O&M facility would be at SW Hunziker Street, adjacent to the WES Commuter Rail tracks. The second location, known as the "Through 72nd Facility," would be southeast of the Tigard Triangle between SW 72nd Avenue and I-5.

Minimum Operable Segments

A minimum operable segment (MOS) is a shorter version of the project that would be suitable to build as a first phase. An MOS must have the ability to function as a standalone project with logical termini if no other phases are built. This Draft EIS considers MOS options that terminate either at the Tigard Transit Center (for either a Through Route or a Branched Route) or at Bridgeport Village (for a Branched Route only).

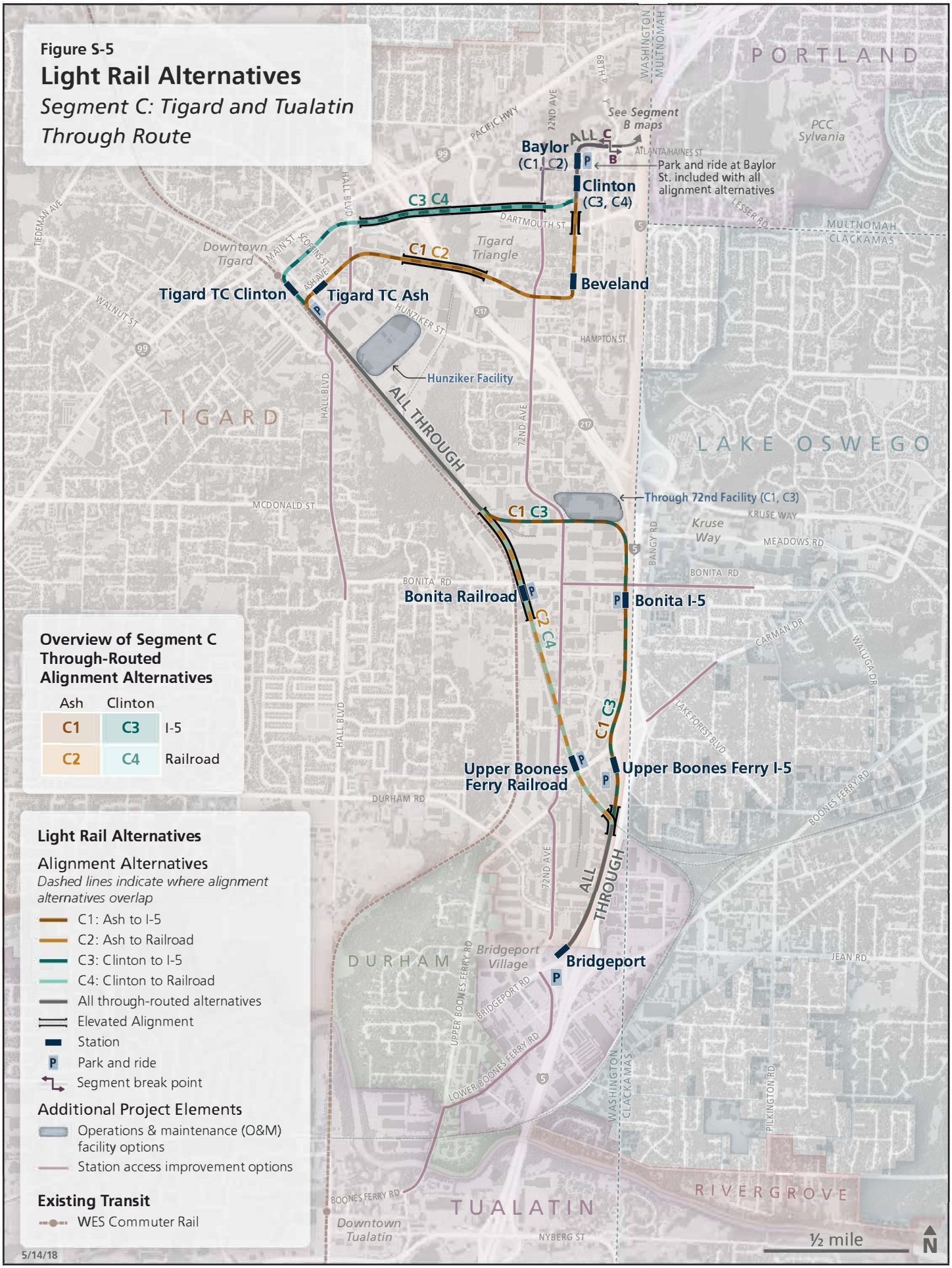


Figure S-5
Light Rail Alternatives
Segment C: Tigard and Tualatin Through Route
PORTLAND
See Segment B maps
PCC Sylvania
Baylor (C1, C2)
ALL C
B
Park and ride at Baylor St. included with all alignment alternatives
Clinton (C3, C4)
C3 C4
C1 C2
Tigard Triangle
Beveland
Downtown Tigard
Tigard TC Clinton
Tigard TC Ash
Hunziker Facility
TIGARD
ALL THROUGH
LAKE OSWEGO
Through 72nd Facility (C1, C3)
C1 C3
Kruse Way
Bonita Railroad
Bonita I-5
C2 C4
Upper Boones Ferry Railroad
Upper Boones Ferry I-5
Bridgeport
DURHAM
Bridgeport Village
TUALATIN
Downtown Tualatin
RIVERGROVE
½ mile
N
Overview of Segment C Through-Routed Alignment Alternatives
Ash
Clinton
C1
C3
I-5
C2
C4
Railroad
Light Rail Alternatives
Alignment Alternatives
Dashed lines indicate where alignment alternatives overlap
C1: Ash to I-5
C2: Ash to Railroad
C3: Clinton to I-5
C4: Clinton to Railroad
All through-routed alternatives
Elevated Alignment
Station
Park and ride
Segment break point
Additional Project Elements
Operations & maintenance (O&M) facility options
Station access improvement options
Existing Transit
WES Commuter Rail
5/14/18

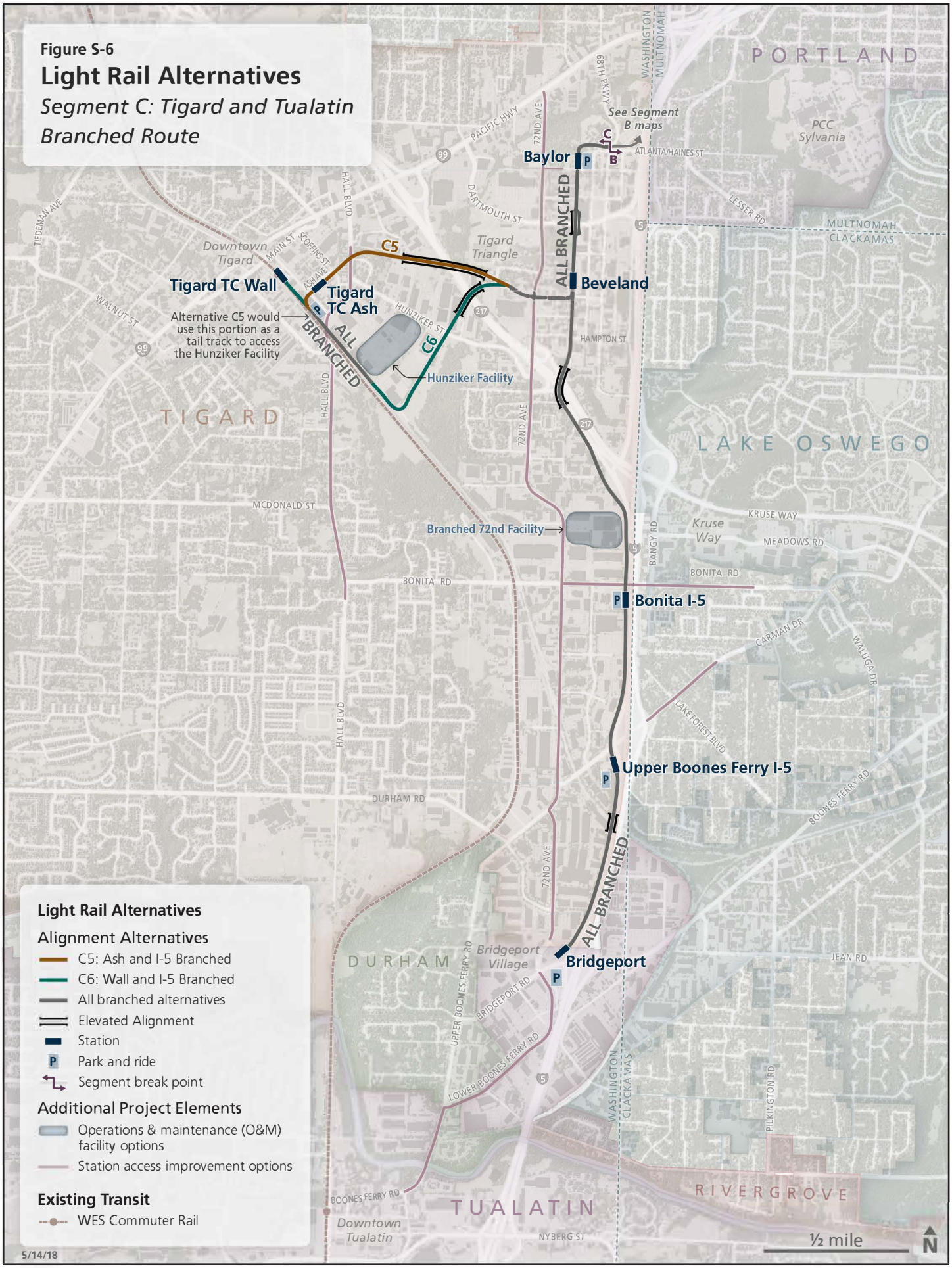


Figure S-6
Light Rail Alternatives
Segment C: Tigard and Tualatin
Branched Route
PORTLAND
TIGARD
LAKE OSWEGO
TUALATIN
DURHAM
RIVERGROVE
Baylor
Beveland
Tigard TC Wall
Tigard TC Ash
Alternative C5 would use this portion as a tail track to access the Hunziker Facility
C5
C6
ALL BRANCHED
Hunziker Facility
Branched 72nd Facility
Bonita I-5
Upper Boones Ferry I-5
Bridgeport
See Segment B maps
Downtown Tigard
Tigard Triangle
Kruse Way
Bridgeport Village
Downtown Tualatin
PCC Sylvania
MULTNOMAH CLACKAMAS
WASHINGTON MULTNOMAH
WASHINGTON CLACKAMAS
PACIFIC HWY
72ND AVE
HALL BLVD
DARTMOUTH ST
HUNZIKER ST
HAMPTON ST
MCDONALD ST
BONITA RD
KRUSE WAY
MEADOWS RD
BANGY RD
CARMAN DR
WALUGA DR
LAKE FOREST BLVD
BOONES FERRY RD
UPPER BOONES FERRY RD
LOWER BOONES FERRY RD
BRIDGEPORT RD
JEAN RD
PILKINGTON RD
NYBERG ST
ATLANTA/HAINES ST
LESSER RD
TIEDEMAN AVE
MAIN ST
SCOFFINS ST
ASH AVE
WALNUT ST
Light Rail Alternatives
Alignment Alternatives
C5: Ash and I-5 Branched
C6: Wall and I-5 Branched
All branched alternatives
Elevated Alignment
Station
Park and ride
Segment break point
Additional Project Elements
Operations & maintenance (O&M) facility options
Station access improvement options
Existing Transit
WES Commuter Rail
5/14/18
½ mile
N

Initial Route Proposal

This Draft EIS identifies a draft Preferred Alternative, known as the initial route proposal, to give the public and federal, state and local agencies, and tribal governments an opportunity to comment on a full-length light rail alternative. The initial route proposal was developed by project partner staff based on information from the Draft EIS analysis and on public outreach.

The initial route proposal is a 12-mile through-routed light rail line with 13 stations, a Marquam Hill connection, a PCC-Sylvania shuttle and an O&M facility (Figure S-7 and Table S-3). The initial route proposal is based on Alternatives A1 (Barbur), B2 (I-5 Barbur Transit Center to 60th), and C2 (Ash to Railroad), with design refinements in selected areas where impacts could be reduced or benefits improved by modifying the design. If there is insufficient funding to construct the entire light rail line, the MOS for the initial route proposal would terminate at the Tigard Transit Center.

The Southwest Corridor Light Rail Project will include a set of station access improvements that will be selected prior to the Final EIS. If Alternative A1 is included in the Preferred Alternative, the Portland region will seek to fund and construct the Bridgehead Reconfiguration as a companion project.

Potential Design Refinements

Based on the impact analysis conducted for this Draft EIS, TriMet, Metro and their partners developed design refinements that could be used to help avoid or reduce impacts by making design modifications, and would result in an overall improvement in project impacts, benefits and costs. These refinements are discussed in Chapter 2 – Alternatives Considered, and more detail is in Appendix E.

Construction Activities

The construction of the Southwest Corridor Light Rail Project would be a major undertaking, similar in scale, duration and complexity to other major public works projects that have been built in the region, such as the Orange Line extending light rail from downtown Portland to Milwaukie. Construction activities could begin by 2022, with major construction lasting approximately four years, followed by system testing. The phases of construction include clearing and demolition, utility relocation, development of major structures, civil and track construction, systems installation and installation of station amenities. The final phases involve testing and finish work, leading up to the opening of the line to passenger service. In addition to the areas where the project would be constructed, other areas would be needed for project staging, including for equipment and materials storage, laydown or preconstruction of some elements; field administration offices; and construction vehicle parking. The project area's major roadways, as well as I-5, would be construction haul routes.

Table S-3. Initial Route Proposal Overview

Alignment Alternatives with Design Refinements[1]	Additional Project Elements
Alternative A1: Barbur	
· *Includes a design refinement for "The Woods" area along SW Barbur Blvd. that shifts the alignment to reduce historic property impacts and construction-period impacts* · Shorter pedestrian connection to Marquam Hill · Faster travel time for light rail and buses in the shared transitway · Fewer displacements of residential units, businesses, employees and potentially eligible historic resources	· Marquam Hill connection[2]
Alternative B2: I-5 Barbur Transit Center to 60th	
· *Includes design refinements for a Taylors Ferry I-5 overcrossing and a modified SW Barbur Blvd. crossing and related alignment to reduce property impacts and other impacts* · More accessible station locations and greater safety improvements for all travel modes compared to Alternatives B3 and B4 · Fewer residential displacements than Alternative B4 · Avoidance of complex reconstruction of the SW Barbur Blvd./I-5 bridge at Crossroads required under Alternative B1	· PCC Sylvania- shuttle[2]
Alternative C2: Ash to Railroad	
· *Includes refinements to the Tigard Transit Center Station with a revised alignment in the Tigard Triangle to downtown Tigard, in order to reduce property impacts and other impacts* · Better support for land use development plans with two stations serving the Tigard Triangle (compared to Alternatives C3 and C4) · Avoidance of critical traffic impact at SW Hall Blvd. associated with Alternatives C3 and C4 · Fewer business and employee displacements along I-5 in southern Tigard compared to Alternatives C1, C3, C5 and C6 · More frequent service in downtown Tigard and better transit connectivity between downtown Tigard and areas to the south compared to the Branched Route (Alternatives C5 and C6)	· Hunziker O&M facility

Note: O&M = operations and maintenance; PCC = Portland Community College; TC = Transit Center.

[1] The design refinements have not been analyzed at the same level of detail as the alignment alternatives in this Draft EIS. Design refinements would be incorporated into the Preferred Alternative in the Final EIS.

[2] The specific options for the Marquam Hill connection and the PCC-Sylvania shuttle route will be identified after the Draft EIS and before the Final EIS through a public process that will involve the institutions, neighborhoods and appropriate resource agencies.

Figure S-7

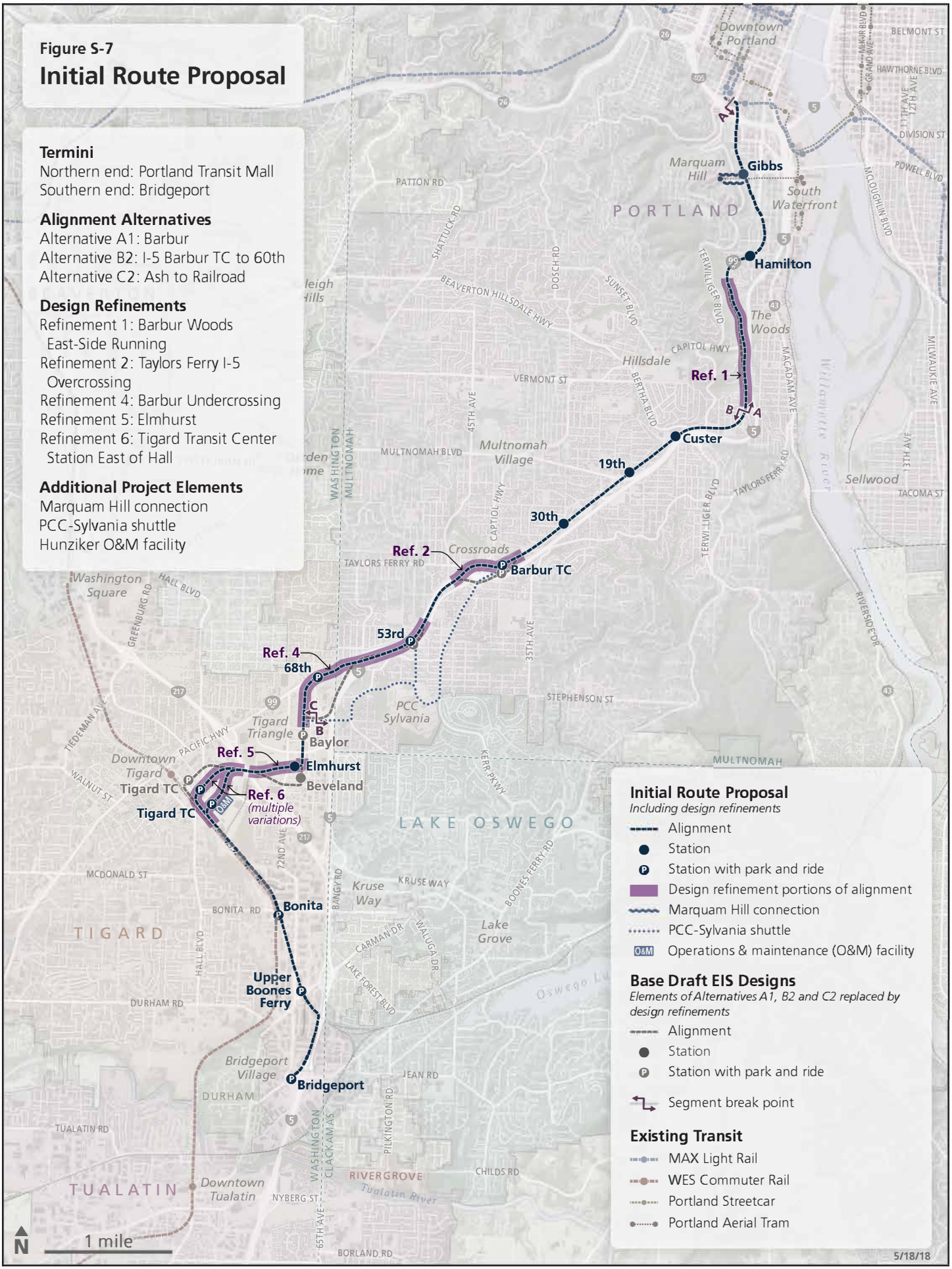
Initial Route Proposal

Termini
Northern end: Portland Transit Mall
Southern end: Bridgeport

Alignment Alternatives
Alternative A1: Barbur
Alternative B2: I-5 Barbur TC to 60th
Alternative C2: Ash to Railroad

Design Refinements
Refinement 1: Barbur Woods East-Side Running
Refinement 2: Taylors Ferry I-5 Overcrossing
Refinement 4: Barbur Undercrossing
Refinement 5: Elmhurst
Refinement 6: Tigard Transit Center Station East of Hall

Additional Project Elements
Marquam Hill connection
PCC-Sylvania shuttle
Hunziker O&M facility



S.4 Background on Southwest Corridor Planning

Public scoping for the Southwest Corridor Light Rail Project EIS began September 2, 2016, and included a comment period that ended October 3, 2016. Public scoping was intended to encourage public and agency comments on the project's Purpose and Need, the range of alternatives being studied and the focus of the environmental analysis. During the public comment period, there were:

- two public online surveys
- five neighborhood association meetings
- an agency and tribal scoping meeting on September 20, 2016
- a public scoping meeting on September 22, 2016

The start of the EIS process for the project follows years of regional planning. In 2009, Metro adopted the 30-year *High Capacity Transit System Plan*, also known as the HCT Plan, to guide investments in light rail, commuter rail, bus rapid transit and rapid streetcar in the Portland region. The HCT Plan identified the Southwest Corridor, the area between downtown Portland and Sherwood including Tigard and Tualatin, as a priority. Between 2011 and 2016, Metro and its local agency partners[1] developed the Southwest Corridor Plan to identify a high capacity transit project and other investment strategies to help improve safety and quality of life, and to support regional and local land use plans and economic development. This plan and its accompanying alternatives analysis and public engagement created the framework for the Purpose and Need (Chapter 1) and the alternatives now being considered in this Draft EIS. Chapter 6 – Public Involvement and Agency Coordination has more information on public engagement efforts to date.

S.5 Transportation and Environmental Effects

Table S-4 reviews the range of environmental effects identified in this Draft EIS, highlighting where the light rail alternatives have different effects compared to the No-Build Alternative or each other. Where the differences in impacts between the individual alternatives and their need for mitigation are notable, the table shows more detail. Otherwise, it shows the general effects for all light rail alternatives. Environmental topics for which there are no clear differences and no effects requiring mitigation are not detailed in the table (Land Use, Air Quality, Energy, Utilities and Public Services).

Table S-4. Summary of Transportation and Environmental Effects *(multi-page table)*

Environmental Discipline	Impacts and Benefits
Transportation • Transit • Streets • Bicycle and Pedestrian • Parking • Freight • Safety	• Compared to the No-Build Alternative, the light rail alternatives would notably improve transit reliability and frequency • Light rail offers up to 9-minute faster in-vehicle transit travel times on full-corridor transit trips than the No-Build Alternative • Light rail would carry up to 41,600 daily light rail riders by year 2035, and the full-corridor project covers up to 8 percent more total transit riders (on bus and rail) than the No-Build Alternative • There would be increased vehicular, bicycle and pedestrian activity around transit stations and park and rides

[1] In addition to Metro, the local agency partners are the Tri-County Metropolitan Transportation District of Oregon (TriMet); Oregon Department of Transportation (ODOT); the cities of Beaverton, Durham, King City, Portland, Sherwood, Tigard and Tualatin; and Washington County.

Table S-4. Summary of Transportation and Environmental Effects *(multi-page table)*

Environmental Discipline	Impacts and Benefits
	• Local and arterial intersections with congestion or queues below standards would have mitigation available to return to No-Build Alternative conditions or better • Impacts to local freight access to individual properties could create out-of-direction travel and increase travel times • Construction could temporarily reduce highway and local roadway capacity, increase truck traffic, involve sidewalk and road closures or detours, and affect access and travel times for transit
Residential Acquisitions and Displacements	• A full-corridor project would acquire and displace 78 to 293 residential units • Segment A alternatives would affect 41 to 125 residential units, with A2-LA having the highest impacts and A1 the least • Segment B alternatives would affect 32 to 78 residential units, with B4 having the highest impacts and B1 the least • Segment C alternatives would affect 5 to 85 residential units, with C1/C2 and C5 having the highest impacts and C3/C4 and C6 the least
Economics (Business Displacements)	• A full-corridor project would have acquisitions affecting 106 to 156 businesses or institutions and 961 to 1,990 employees • Segment A alternatives would have acquisitions affecting 15 to 23 businesses and 108 to 371 employees, with A2-BH and A2-LA having the highest impacts and A1 the least • Segment B alternatives would affect 54 to 66 businesses and 469 to 565 employees, with B1 affecting the fewest businesses, B2 affecting the fewest employees, and the other alignment alternatives at the higher end of the impact range • Segment C alternatives would affect 31 to 55 businesses and 323 to 839 employees; C5 would affect the most businesses, and C3 the most employees • Temporary construction impacts would involve increased traffic congestion and reroutes, noise, vibration, dust, and changes to business access and visibility
Communities	• In all segments, clusters of residential and business displacements could disrupt individual social ties and indirectly cause property values to increase through redevelopment around stations, which could affect low-income populations • In Segment A, all alternatives would affect parking for a church, but replacement parking could be provided as mitigation • In Segment C, Alternatives C1, C2 and C5 would displace a community lodge and businesses providing counseling and a medical clinic • Alternatives C3 and C4 would displace the Tigard U.S. Post Office • Alternatives C3 and C6 would displace a medical clinic • Alternatives C1, C2 and C5 (SW Ash Ave. alignments) would displace a cluster of multifamily residential buildings in the Downtown Tigard neighborhood along SW Hall Blvd. and SW Ash Ave.; the relocation of several blocks of residents would alter the current character and social interactions in this neighborhood. Improved transportation infrastructure and services for all modes could benefit area residents, businesses and patrons
Visual Quality	• Segment A alternatives would have moderate visual impacts overall, but there would be areas with higher impacts due to building and vegetation removal, such as near Marquam Hill, along SW Barbur Blvd. in The Woods, and in areas with historic properties • Segment B alternatives would have moderate visual impacts overall • Segment C alternatives would have high impacts in the Tigard Triangle and downtown Tigard due to prominent new structures, vegetation removal and removal of buildings in areas with nearby residences; Alternatives C1, C2 and C5 would have the highest visual impacts
Historic and Archaeological Resources	• A full-corridor project would have a presumed adverse effect due to full parcel acquisitions of 7 to 21 historic properties • Segment A alternatives would involve full parcel acquisitions on 5 to 15 historic properties, with A2-LA having the highest • All Segment A alternatives would impact two historic trestle bridges on SW Barbur Blvd. • Segment B alternatives would involve 2 to 5 historic properties, with B1 having the most • All of the alignment alternatives could encounter potential archaeological sites

Table S-4. Summary of Transportation and Environmental Effects *(multi-page table)*

Environmental Discipline	Impacts and Benefits
Parks and Recreation Resources	• A1 would remove vegetation bordering Duniway Park and Lair Hill Park • A2-BH and A2-LA would affect strips of land bordering Water and Gibbs Community Garden and Front and Curry Community Garden • All Segment A alternatives would remove vegetation and trees along the Terwilliger Parkway/open space along SW Barbur Blvd. and for the Marquam Hill connection, and in George Himes Natural Area Park • All Segment B alternatives would remove vegetation and trees bordering Fulton Park between the community garden and the street
Geology, Soils and Hydrogeology	• All alternatives are in a seismically active region that requires engineering measures to address the risk of damage from earthquakes • All alternatives cross areas that require measures to reduce slope instability risks
Ecosystems Resources	• A full-corridor project would involve between 1.3 and 1.6 acres of permanent wetland impacts • Tree removal in Segments A and B would affect some protected areas such as stream crossings; there would be less than 0.1 acre of permanent wetland impacts in each segment • Several stream and wetland crossings by alignment alternatives in Segment C; permanent wetland impacts would range from 0.4 acre to 1.6 acres, with C3 and C4 (Clinton) having the most
Water Resources	• There would be increased pollution-generating and non-pollution-generating impervious surfaces for all alternatives • There would be floodplain impacts for all alternatives in Segment C except C6
Noise and Vibration	• There are noise and vibration-sensitive properties, including residences, that would be impacted in all three segments • More frequent trains are needed for the Branched Route, thus creating higher noise and vibration impacts • Segment A would have up to 353 moderate noise impacts, up to 8 severe noise impacts and up to 76 vibration impacts • Segment B would have up to 147 moderate noise impacts, 1 severe noise impact and up to 29 vibration impacts • Segment C would have up to 72 moderate noise impacts, up to 15 severe noise impacts and up to 21 vibration impacts • TriMet would mitigate impacts to be below federal severe impact thresholds for all alternatives
Hazardous Materials	• A full-corridor project would acquire 5 to 8 parcels with higher risk for remaining hazardous materials for the alignment, and an O&M facility could involve 2 additional parcels; resulting cleanup would be an environmental benefit • All Segment B alternatives would acquire up to 3 parcels with higher risk for remaining hazardous materials • Segment C alternatives would acquire 2 to 5 parcels with higher risk for remaining hazardous materials, with C5 having the least
Safety and Security	• Car prowls could occur with new or expanded park and rides • Some station locations in Segment C would be in areas that currently experience property and nuisance crimes, particularly in downtown Tigard
Land Use, Air Quality, Energy, Utilities, Public Services	• No adverse long-term impacts

S.6 Effects of a Full-Corridor Alternative and Minimum Operable Segments (MOS)

A full-corridor alternative adds the effects by segment, including for the O&M facility, for an overall total for the project. Transportation effects, particularly the effects that span the full corridor or are regional in nature, such as increased transit ridership and reduced vehicle trips and miles traveled, are greatest for a full-length alternative. These regional transportation effects are generally positive.

The totals for impacts related to the conversion of land ("project footprint impacts" corresponding to property-related impacts and impacts to natural resources) are at their maximum levels with a full-corridor alternative, as shown in Table S-4.

The MOS options could either avoid or defer the impacts of converting some of the existing land uses for use by the transportation project. However, the MOS options would also have less frequent trains than a full-length alternative, which would reduce noise and vibration impacts.

A shorter project involving lower train frequencies and fewer stations would still bring transportation benefits, but these benefits would be reduced (about 9,200 fewer daily trips than a full-length alternative). Other benefits, such as improvements in air quality, would be lower, and a shorter project would have reduced consistency with regional plans for land use and the transportation system.

S.7 Other Environmental Factors

Environmental Justice

FTA has preliminarily concluded that the Southwest Corridor Light Rail Project would not result in disproportionately high and adverse effects on minority and low-income populations, after mitigation and offsetting benefits have been considered. The primary source of impacts would result from residential and business acquisitions and related displacements and relocations. For all alternatives, these impacts would be mitigated through TriMet's real property acquisition policy, including its compensation and relocation assistance program. The number of people affected could be lowered by choosing alternatives with lower impacts, by applying design refinements that avoid or minimize impacts to properties where low-income or minority individuals are present, or by applying other mitigation or benefits to offset the impacts. After the Draft EIS public comment period concludes, FTA, Metro and TriMet will continue to identify and evaluate measures to minimize the impacts to low-income and minority populations, and they will seek additional ways to maximize benefits to help offset remaining impacts. More details are in Appendix C – Environmental Justice Compliance.

Section 4(f) and Section 6(f) of the Land and Water Conservation Fund Act

Section 4(f) is a federal regulation[2] that restricts FTA's ability to approve a project that adversely affects parks and recreation resources. The Land and Water Conservation Fund (LWCF) Act authorized a federal grant program, and Section 6(f) of the Act places-requirements on projects that impacts parks bought through the fund. This Draft EIS analysis has identified potential adverse impacts to historic resources in Segments A and B, as well as impacts to several parks, including the Terwilliger Parkway, which has a parcel acquired through the LWCF. Therefore, in preparing the Final EIS, FTA, Metro and TriMet will need to continue to review avoidance measures and further define mitigation, working closely with other agencies that have jurisdiction over the affected properties. These regulations, as well as the comments of other agencies with jurisdiction over affected resources, could affect the

[2] Section 4(f) refers to a U.S. Department of Transportation (USDOT) statute that restricts FTA's ability to approve a project that adversely affects significant parks, recreation resources, fish and wildlife refuges, and historic properties, unless no other feasible and prudent alternative is available. Section 6(f) of the Land and Water Conservation Act requires that the conversion of lands or facilities acquired with Land and Water Conservation Act funds be coordinated with the Department of Interior. Usually replacement in kind is required.

definition of the project that advances to the Final EIS. Additional details are in Appendix D – Draft Section 4(f) Evaluation and Draft Section 6(f) of the Land and Water Conservation Fund Evaluation.

S.8 Evaluation of Alternatives

Chapter 5 – Evaluation of Alternatives evaluates the ability of the light rail alternatives to meet the project's Purpose and Need statement, comparing the environmental, transportation and cost differences among the alternatives. While all of the light rail alternatives would meet the Purpose and Need, Chapter 5 highlights areas where the initial route proposal and its design refinements would best meet the Purpose and Need, reduce impacts, maximize benefits, and create the most cost-effective project to build and operate. Environmental effects due to property acquisitions and resulting building removals, including historic properties, as well as impacts to businesses and employees are the primary differentiating factors. There are also differences in how various alignment and station configurations affect travel times, multimodal access, constructability and construction impacts.

The chapter also covers capital and operating costs and finances, which are summarized in Table S-5 for the full corridor and MOS for both the Draft EIS alternatives and the initial route proposal with design refinements. Comparative capital costs for the alignment alternatives by segment are shown in Table S-6. Chapter 5 – Evaluation of Alternatives has more details and an illustrative finance plan.

Table S-5. Estimated Project Capital and Operating Costs

	Total Capital Cost Range[1]	Annual O&M Cost[2]
Draft EIS Alternatives		
Through Route	$3,270 to $3,590 million	$22 million
Branched Route	$3,390 to $3,630 million	$30 million
Tigard Transit Center MOS	$2,920 to $3,160 million	$19 million
Bridgeport MOS	$2,970 to $3,170 million	$22 million
Initial Route Proposal (with design refinements)		
Full corridor	$2,640 to $2,860 million	$22 million
MOS	$2,170 to $2,410 million	$19 million

Note: MOS = minimum operable segment; O&M = operating and maintenance.

[1] Capital costs are in year-of-expenditure (2024) dollars and include finance costs.

[2] Operating costs assume 2035 service frequencies.

Table S-6. Capital Cost Differences Between Alignment Alternatives

Alignment Alternative	Capital Cost Difference[1] *Compared to lowest cost*
Segment A: Inner Portland	
A1: Barbur	lowest cost
A2-BH: Naito Bridgehead	+$140 million
A2-LA: Naito Limited Access	+$160 million
Segment B: Outer Portland	
B1: Barbur	+$40 million
B2: I-5 Barbur TC-60th	+$30 million
B3: I-5 26th-60th	lowest cost
B4: I-5 Custer-60th	lowest cost
Segment C: Tigard and Tualatin	
C1: Ash-I-5	+$60 million
C2: Ash-RR	lowest cost
C3: Clinton-I-5	+$120 million
C4: Clinton-RR	+$60 million
C5: Ash-I-5 Branched	+$20 million
C6: Wall-I-5 Branched	+$60 million

[1] Costs are in year of expenditure (2024) dollars and include finance costs.

S.9 Next Steps and the Project Timeline

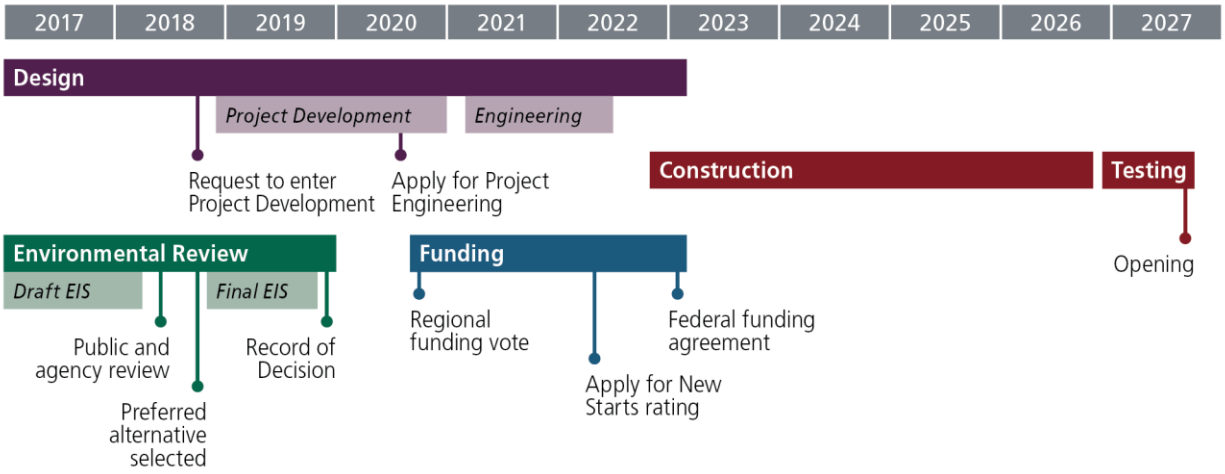
The project schedule, with this Draft EIS being a major milestone, is shown on Figure S-8. A 45-day public review period of the Draft EIS begins once it is published in the Federal Register. After the close of the review period, the Southwest Corridor Steering Committee will recommend a single route—the Preferred Alternative—considering the information from this Draft EIS and comments from the public, staff and the Community Advisory Committee. The Metro Council will also consider the recommendations, the Draft EIS, and comments from the public, agencies and Tribes before adopting the Preferred Alternative.

Certain project components (Marquam Hill connection, PCC-Sylvania shuttle, and station access improvements) may not be defined in the Preferred Alternative, due to the need for further public process, but will be identified prior to development of the Final EIS. FTA, Metro and TriMet will prepare a Final EIS to respond to the substantive comments received on this Draft EIS, and state the complete Southwest Corridor Light Rail Project, environmental findings and mitigation requirements.

Once the federal environmental review concludes, the Portland region will need to identify and commit local funds to the project and request federal matching funds. Construction would take approximately four years once funding is secured.

Figure S-8

Project Schedule



Help plan MAX light rail in the Southwest Corridor

Alternatives for a new MAX light rail line serving southwest Portland, Tigard and Tualatin were studied in the Southwest Corridor Light Rail Project Draft Environmental Impact Statement. The study is available for review and comment June 15–July 30. Your comments can improve the study and help determine which route is pursued for further study, design and funding.

Read the study online at *swcorridorplan.org*, or review hard copies at Metro's office (600 NE Grand Ave, Portland, Oregon 97232) or at the following libraries: Hillsdale, Capitol Hill, Tigard, Tualatin, PSU and PCC Sylvania.

Comment online at *swcorridorplan.org* or at:

Open House
Tuesday, June 26, 2018, 6–8:30 p.m.
Markham Elementary School
10531 SW Capitol Hwy, Portland, OR 97219

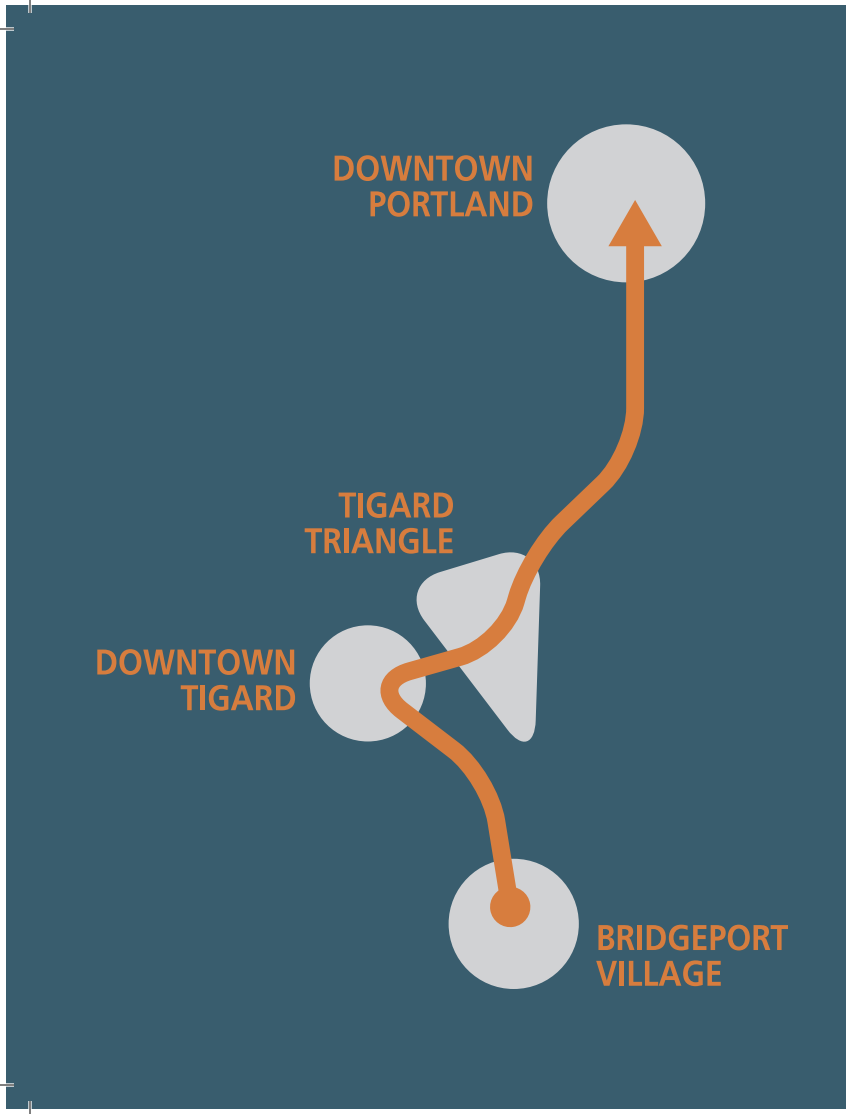
Open House
Thursday, July 12, 2018, 6–8:30 p.m.
Tigard Public Library
13500 SW Hall Blvd, Tigard, OR 97223

Public Hearing
Thursday, July 19, 2018, 6 p.m.
Tigard Town Hall
13125 SW Hall Blvd, Tigard 97223

Call or write: 503-797-1881, *swcorridordeis@oregonmetro.gov*, SW Corridor, 600 NE Grand Ave, Portland, Oregon 97232

Ayude a planear el tren ligero de MAX en el Corredor Suroeste

Comuníquese por: 503-797-1888, *swcorridordeis@oregonmetro.gov*, o a SW Corridor, 600 NE Grand Ave, Portland, Oregon 97232



GREAT PLACES
SW Corridor

600 NE Grand Avenue
Portland, OR 97232

List of DEIS comment period public meetings

June 12	10 am to 2 pm	OHSU Farmer's Market	OHSU - Sam Jackson Park Road
June 21	4:30-6:30 p.m.	DEIS information hours with staff – Come ask questions	Hillsdale Library
June 25	6:15-8:45 pm	Community Advisory Committee meeting	Multnomah Arts Center
June 26	6:00 - 8:30 pm	DEIS Open House in SW Portland	Markam Elementary School
June 28	4:30-6:30 p.m.	DEIS information hours with staff – Come ask questions	1900 SW 4th Avenue, Portland
July 2	4:30 -6:30 p.m.	DEIS Staff information station	Tualatin Library
July 10	6:30 - 9 pm	Unite Oregon and Metro Host "Housing, Transit, and You" En Español & In English	St. Anthony's Church
July 12	6-8:30 pm	Tigard/Tualatin Open House	Tigard Library (community auditorium and computer lab)
July 16	4:30-6:30 pm	DEIS information hours with staff – Come ask questions	Capitol Hill Library
July 19	6-8:30 p.m.	DEIS Public Hearing and Steering Committee meeting	Tigard Town Hall
July 30	6:15-8:15 p.m.	Community Advisory Committee meeting	Multnomah Arts Center