

# HCT alignment modifications based on technical analysis

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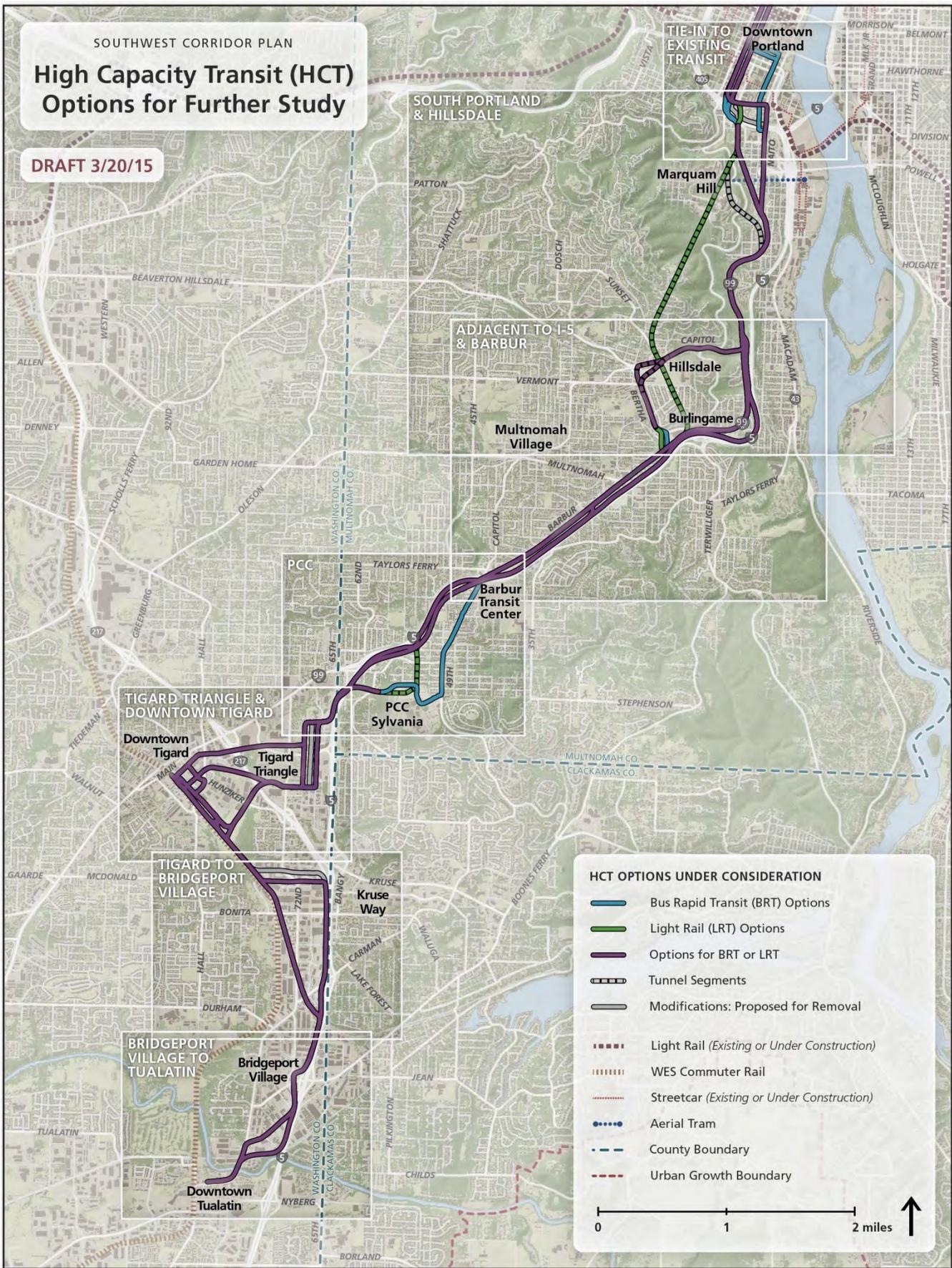
*Southwest Corridor Plan*

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SOUTHWEST CORRIDOR PLAN  
**High Capacity Transit (HCT)  
 Options for Further Study**

DRAFT 3/20/15



## Introduction

### *Overview of technical work completed during the focused refinement period*

In June 2014, the Southwest Corridor Steering Committee directed project staff to address the following questions regarding the high capacity transit (HCT) alignment options in a focused refinement period prior to beginning the Draft Environmental Impact Statement:

1. **Tie-in to existing transit:** Determine the best approach to tie in to downtown Portland and the existing transit system through additional traffic analysis and partner discussion.
2. **Marquam Hill access:** Explore options for pedestrian/bicycle access to Marquam Hill from a surface alignment on Barbur or Naito.
3. **Tunnels to Marquam Hill:** Explore replacing the short tunnel that serves Marquam Hill with the medium tunnel that also serves Hillsdale.
4. **Hillsdale access:** Explore the benefits as compared to the costs and travel time of directly serving the town center, and look at enhanced pedestrian/bicycle connections from Barbur Boulevard.
5. **Adjacent to I-5:** Further explore and discuss the tradeoffs of providing HCT adjacent to I-5 rather than on Barbur Boulevard.
6. **PCC Sylvania access:** Assess the potential of a more robust pedestrian connection from Barbur Boulevard to PCC along SW 53<sup>rd</sup> Ave while working with PCC and the neighborhood to understand the trade-offs of direct service for future campus plans.
7. **HCT branch service to Tigard and Tualatin:** Explore opportunities to implement branched service to downtown Tigard and south to Tualatin to achieve operational efficiencies.

Since the June 2014 Steering Committee meeting, project staff completed additional traffic analysis, technical drawings, and transit demand model runs, focusing in particular on the tie-in to existing transit, tunnels to Marquam Hill, adjacent to I-5 routing and Barbur center-running alignments, and downtown Tigard and branch service options.

In addition to the questions presented by the Steering Committee, project staff responded to concerns raised with the existing alignments by further examining the existing options and developing new alignments as needed. Some new options emerged and some previously removed options resurfaced during this further technical analysis.

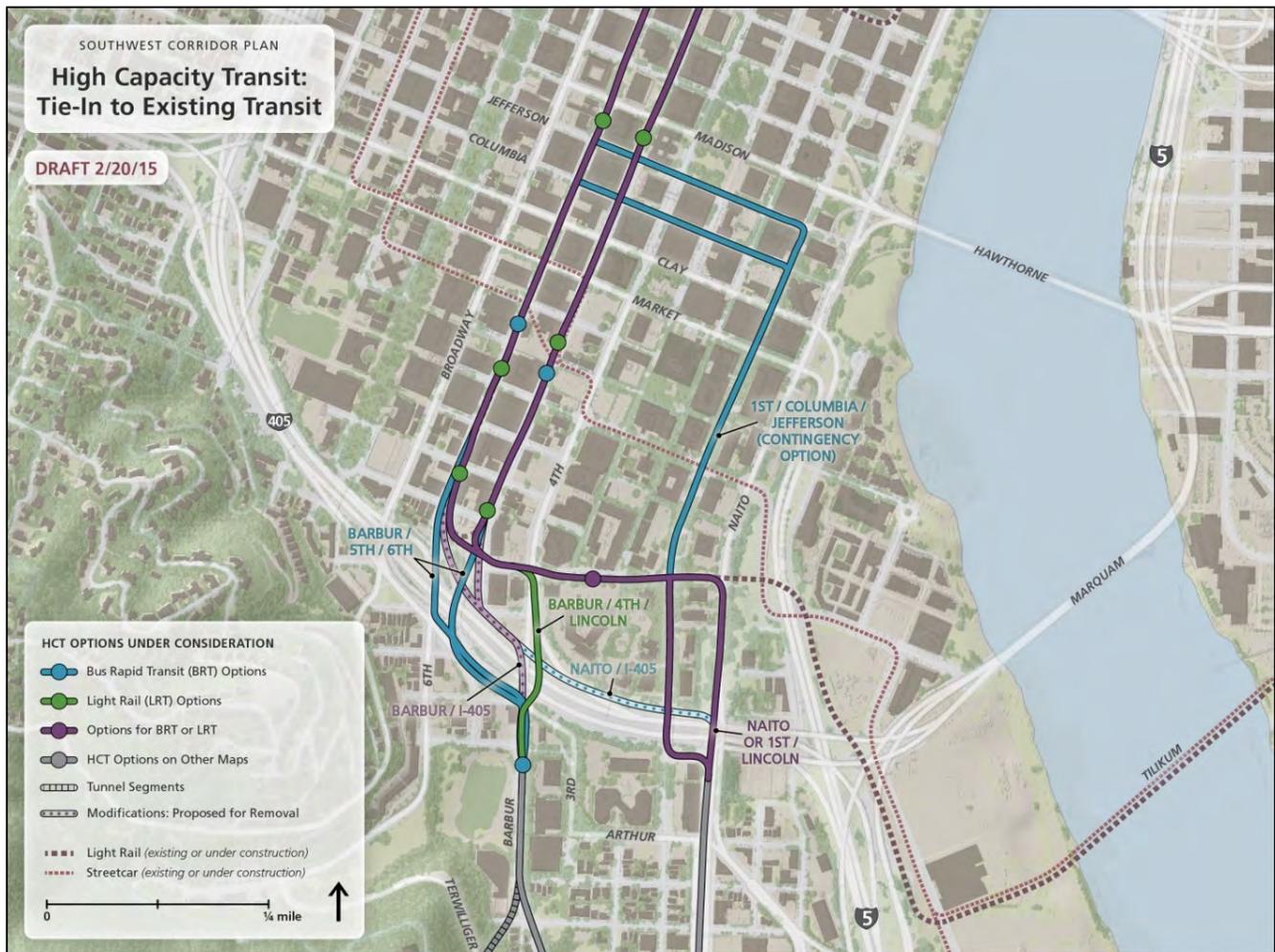
As a result of this technical work, project staff propose several modifications to the list of HCT alignment options currently under consideration, including removing, replacing, revising and adding options. Note that the alignments shown in this memo are subject to change upon further analysis and discussion, including changes in station locations.

Public input on these recommended changes will be gathered in May and June, leading up to a July 2015 Steering Committee decision. This memo outlines both the project team's response to Steering Committee questions and additional staff recommendations based on further technical analysis.

## Project team response to Steering Committee questions

1. **Tie-in to existing transit:** recommend removing BRT and LRT options parallel to I-405 and keeping 1<sup>st</sup> Ave BRT as contingency option
2. **Marquam Hill access:** produced five different concepts for providing pedestrian/bicycle access from a surface alignment station on Barbur or Naito
3. **Tunnels to Marquam Hill:** recommend replacing Marquam Hill LRT tunnel (formerly “short tunnel”) with Marquam Hill-Hillsdale LRT tunnel (formerly “medium tunnel”)
4. **Hillsdale access:** have studied costs and benefits of direct service to Hillsdale; will continue to explore how Shared Investment Strategy projects help enhance a connection to Hillsdale if HCT is routed along Barbur Boulevard
5. **Adjacent to I-5 at mid-Barbur:** further evaluated cost, travel time, and property impacts of three segments of adjacent to I-5 alignment; identified new segment to evaluate between Barbur Transit Center and 60<sup>th</sup> Avenue; will release fall Key Issues memo with additional information
6. **PCC Sylvania access:** hired a design firm to work with PCC Sylvania staff and the surrounding neighborhood on a redesign of 53<sup>rd</sup> Avenue; will continue to communicate with PCC regarding the future land use vision for the campus and how HCT service relates to those plans
7. **HCT branch service to Tigard and Tualatin:** recommend adding branch service and Beveland to Ash options for both BRT and LRT

## Tie-in to existing transit



### Alignment options evaluated during focused refinement

In June 2014, the Steering Committee directed project staff to further evaluate the options under consideration for connecting to the downtown Portland Transit Mall, and to verify that the Transit Mall has capacity for Southwest Corridor BRT or LRT vehicles. Project staff completed more detailed analysis on the following options:

- A. **Barbur-Broadway (BRT only):** BRT would run along Broadway in between Barbur Boulevard and the 5<sup>th</sup>/6<sup>th</sup> Avenue Transit Mall. BRT would run within the existing 5<sup>th</sup> and 6<sup>th</sup> Avenue bridges over I-405. The southernmost BRT stations on the Transit Mall would be near Mill Street. BRT would also include a station at Barbur and Sheridan Street, near the existing athletic field, because of the long distance between the Mill and Gibbs Street stations.
- B. **Barbur-4<sup>th</sup>-Lincoln (LRT only):** LRT would run on a new structure parallel to the 4<sup>th</sup> Avenue bridge over I-405. At Lincoln, LRT would connect to the Transit Mall via the Portland-Milwaukie light rail (PMLR) tracks currently under construction. The southernmost LRT stations on the Transit Mall would be the existing PSU South stations at 5<sup>th</sup>/Jackson and 6<sup>th</sup>/College.

- C. **Barbur-I-405:** HCT would cross I-405 on a new structure parallel to the 4<sup>th</sup> Avenue bridge, then briefly parallel I-405 on the northwest side to connect to the Transit Mall at 5<sup>th</sup>/6<sup>th</sup>. BRT or LRT would include the same stations described for the Barbur-Broadway and Barbur-4<sup>th</sup>-Lincoln alignments.
- D. **Naito/1st-Lincoln:** HCT would cross I-405 on 1<sup>st</sup> Avenue or Naito Parkway, then run along Lincoln Street to the Transit Mall. LRT would tie into the PMLR tracks currently under construction and share the PMLR station at Lincoln. BRT would include a station nearby the light rail station on Lincoln. BRT could also run on 1<sup>st</sup> from Sheridan to Lincoln instead of Naito.
- E. **Naito-I-405 (BRT only):** BRT would cross I-405 on Naito Parkway, and then run parallel to I-405 on the northwest side to connect to the Transit Mall at 5<sup>th</sup>/6<sup>th</sup>.
- F. **Naito-1<sup>st</sup>-Columbia/Jefferson:** BRT would turn off Naito at Sheridan to cross I-405 on the 1<sup>st</sup> Avenue bridge, then continue along 1<sup>st</sup> until Columbia and Jefferson Street. BRT would connect to the Transit Mall eastbound on Columbia and westbound on Jefferson.

***Proposed modification: remove options parallel to I-405 and keep BRT alignment on 1st Avenue as a contingency option***

Project staff recommend removing the two alignment options that parallel I-405, C and E above, which have engineering challenges that may be very difficult to overcome and could hinder potential future modifications of I-405 ramps. Additionally, the Naito-I-405 alignment has limited options for a station to be located near the PMLR Lincoln station.

BRT on 1<sup>st</sup> north of Lincoln is recommended only as a contingency option for BRT on Naito due to the poor connection to PSU and slow travel times resulting from running in mixed traffic on 1<sup>st</sup> Avenue, Columbia and Jefferson. This alignment will only be evaluated further if running BRT on Lincoln is later found to be unfeasible.

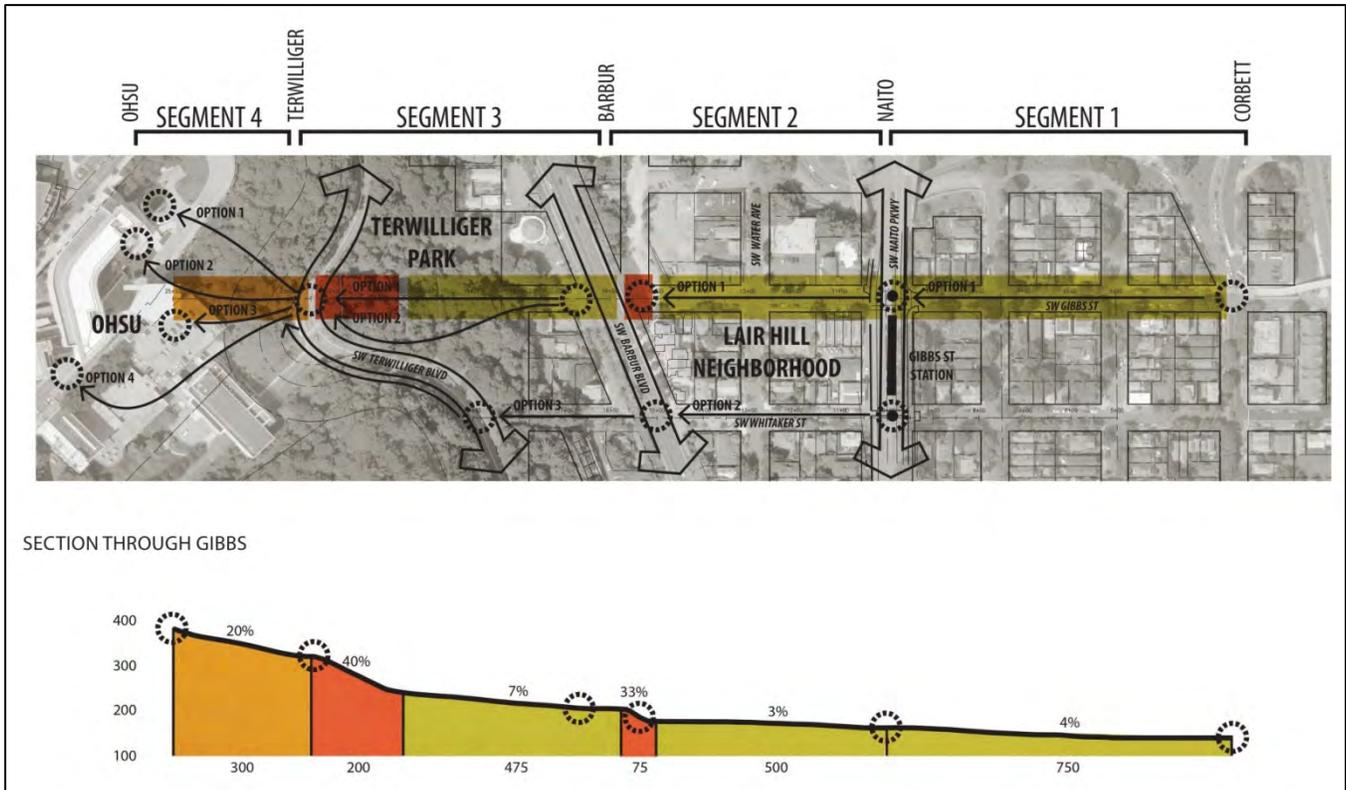
The remaining four alignments would have more direct connections to the Transit Mall with the fewer impacts. These four alignments provide each mode an option to tie in to existing transit from both the Barbur and Naito South Portland alignments.

***Next steps***

Because BRT and LRT each have one preferred means of connecting to the Transit Mall from either Naito or Barbur, the tie-in alignments will no longer be evaluated or narrowed independently, but rather will be linked to the South Portland alignment options for each mode.

The Barbur, Naito and Marquam Hill-Hillsdale tunnel alignments are discussed in more detail in the South Portland Key Issues memo, which was presented at the March 9<sup>th</sup> Steering Committee meeting. In July the Steering Committee will decide whether to continue studying the Marquam Hill-Hillsdale tunnel, but a decision between Barbur and Naito may not be made until after January 2017, when the project is expected to enter the Draft Environmental Impact Statement (DEIS) phase. More detailed traffic analysis on the tie-in to existing transit will be completed during the DEIS, including examining the interactions between SW Corridor HCT and the Powell-Division bus rapid transit project currently being planned.

## Marquam Hill access



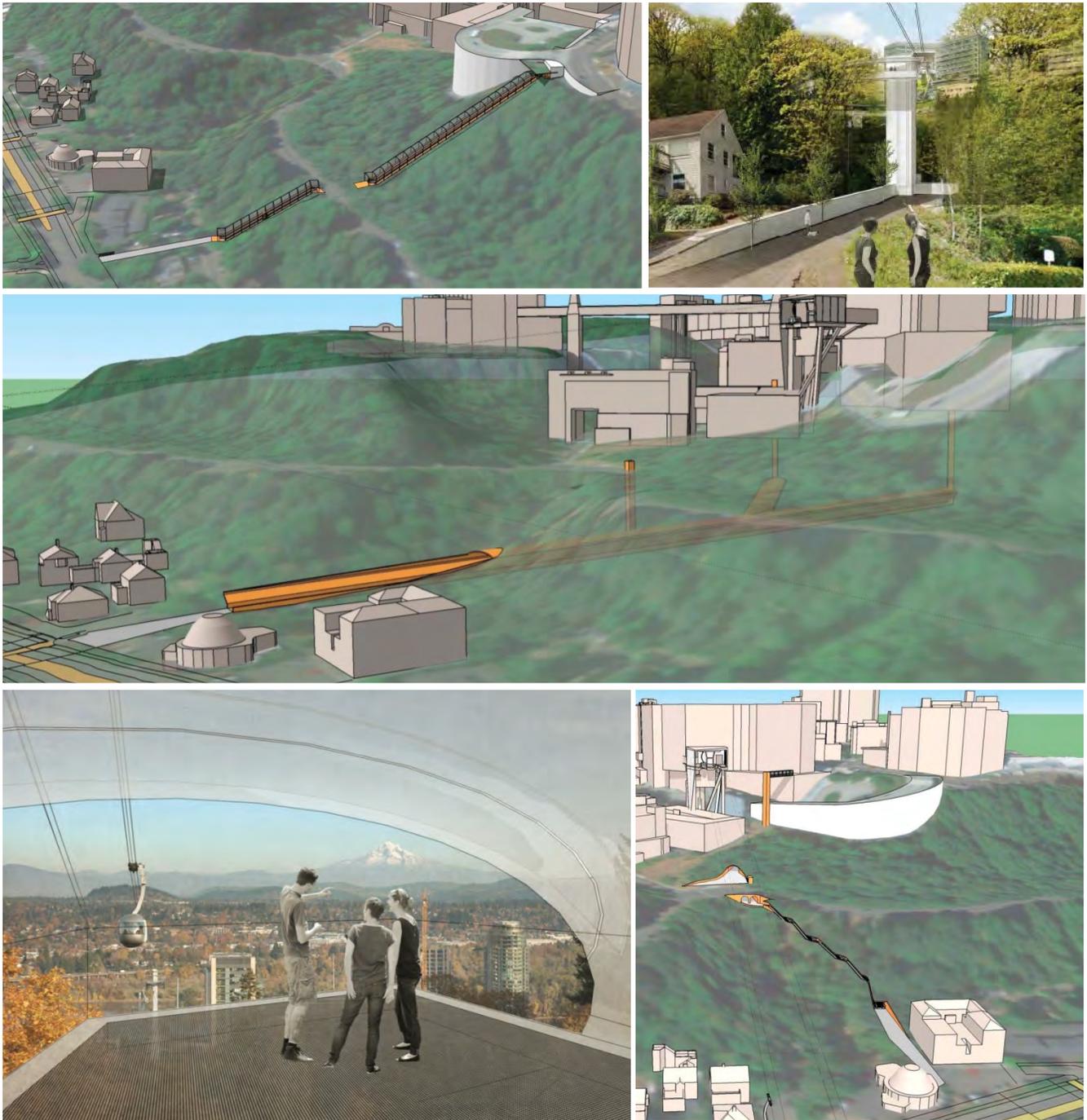
Otak diagram of the distance and elevation between OHSU Marquam Hill campus, Barbur Boulevard, and Naito Parkway.

### Summary of work completed

In June 2014, the Steering Committee directed project staff to further explore a bicycle and pedestrian connection between the Oregon Health & Science University (OHSU) and VA Medical Center on Marquam Hill and an HCT station at either Barbur Boulevard or Naito Parkway near Gibbs Street. The horizontal distance between Barbur Boulevard and the OHSU aerial tram station on Marquam Hill is only approximately 1,000 feet, or just under two tenths of a mile (see diagram above). However, there is currently no safe and accessible means of traversing the steep, wooded hillside between Barbur and Terwilliger Boulevard.

In August 2014, the Otak and Mayer-Reed design firms were hired to conceptually design a connection between a Barbur or Naito HCT station and Marquam Hill that would accommodate both bicyclists and pedestrians. For this exploratory design exercise, the project engaged the surrounding neighborhood groups, adjoining property owners, and several health care providers, including the VA Medical Center, National College of Natural Medicine (NCCNM), and OHSU.

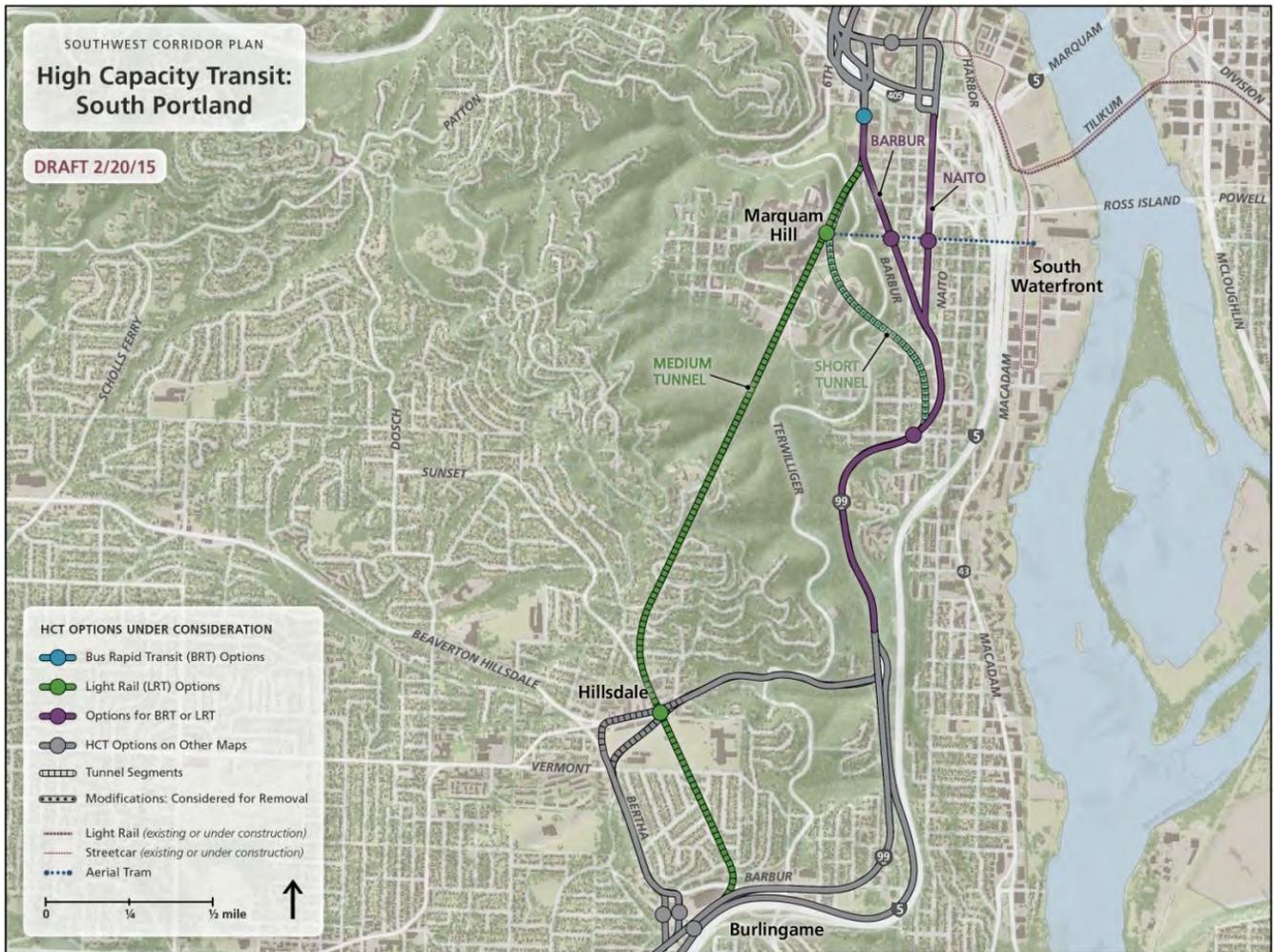
Options studied included elevators/bridges, escalators and a pedestrian tunnel, with access points at Terwilliger and/or within the OHSU campus (see images on opposite page for examples). From this work, it is clear that a well-designed connection from Barbur to the OHSU campus and beyond to the VA Medical Center is feasible, and it is assumed this connection would be constructed as part of a Barbur or Naito surface alignment.



**Next steps**

A summary of the Marquam Hill connection conceptual design work will be released by mid-May. The design process and further discussion of the trade-offs between different means of connecting Marquam Hill to a surface HCT station are now on hold while HCT alignment options are being evaluated and narrowed. Further design work will be undertaken during the DEIS phase.

## Tunnels to Marquam Hill



### Alignment options evaluated during focused refinement

In June 2014, the Steering Committee directed project staff to look into replacing the “short tunnel” to Marquam Hill with the “medium tunnel” to Marquam Hill and Hillsdale. These two light rail tunnel options were evaluated further during the 2014 focused refinement period:

- Marquam Hill tunnel (formerly “short tunnel”):** Light rail would exit Barbur Boulevard near Hooker Street, and enter into a tunnel portal in the hillside below Terwilliger Boulevard. Light rail would emerge from the tunnel at a portal near Hamilton Street. An underground station would serve the OHSU Marquam Hill campus and the VA Medical Center. A surface station near Hamilton would serve the lower Homestead area and a portion of South Portland.
- Marquam Hill-Hillsdale tunnel (formerly “medium tunnel”):** Light rail would exit Barbur Boulevard near Hooker Street, and enter into a tunnel portal in the hillside below Terwilliger Boulevard. Light rail would emerge from the tunnel at a portal near Barbur and Bertha Boulevard. One underground station would serve the OHSU Marquam Hill campus and the VA Medical Center, and another would serve the Hillsdale town center.

*Proposed modification: replace Marquam Hill tunnel with Marquam Hill-Hillsdale tunnel*

After further analysis, project staff recommend replacing the Marquam Hill tunnel with the Marquam Hill-Hillsdale tunnel due to the high fixed cost of bored tunnels, greater travel time savings, the opportunity to provide direct access to the Hillsdale town center, and community preference for the longer tunnel over the shorter tunnel.

The one-mile Marquam Hill tunnel would have a relatively high ratio of fixed to linear costs. The fixed costs, which include retaining walls at the portals, roadway modifications and a tunnel boring machine, would account for approximately 49 percent of the total cost of the tunnel (based on year 2014 dollars without financing or escalation costs). The remaining half of the cost would be from linear costs, including track, overhead wires, excavation and structural materials for the tunnel itself. In contrast, the total cost of the 2.8-mile Marquam Hill-Hillsdale tunnel would be composed of 24 percent fixed costs and 76 percent linear costs.

While the Marquam Hill tunnel would save approximately 24 seconds of travel time compared to light rail on Barbur Boulevard, the Marquam Hill-Hillsdale tunnel would save over one minute. These reductions in travel time would benefit riders beyond only those accessing Marquam Hill or Hillsdale. Model results show that the two tunnels would have a similar number of boardings at the Marquam Hill station, but the longer tunnel has a higher line ridership and more new system transit trips due to its greater travel time savings and direct access to Hillsdale.

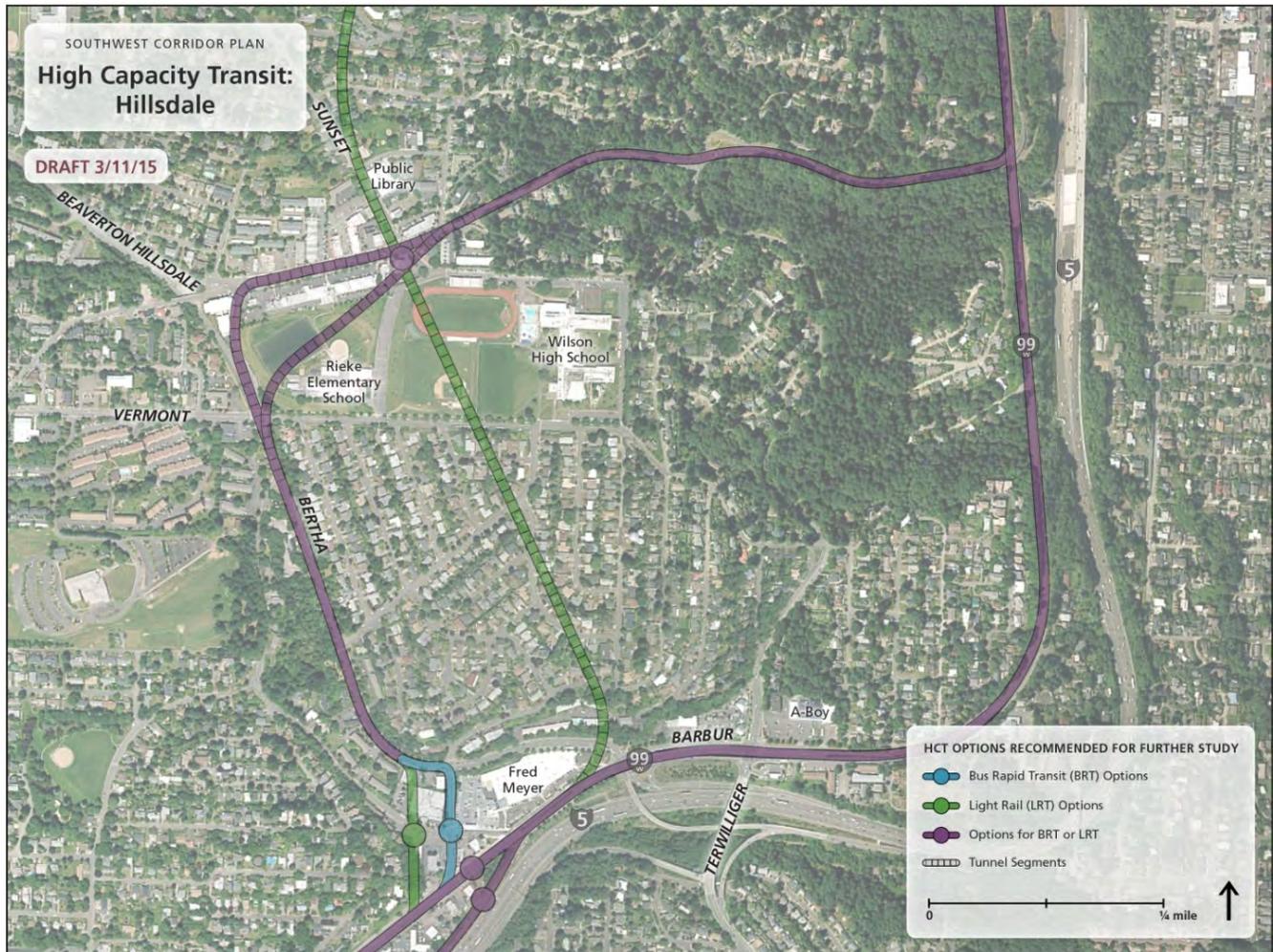
The Marquam Hill-Hillsdale tunnel, while more expensive than the shorter Marquam Hill tunnel, would provide greater benefits. During spring 2014 public outreach, community members expressed stronger support for the longer Marquam Hill-Hillsdale tunnel than for the short Marquam Hill Tunnel. As a result, project staff recommend replacing the Marquam Hill tunnel with the Marquam Hill-Hillsdale tunnel for further consideration.

*Next steps*

The South Portland and Hillsdale Key Issues memos, which were presented to the Steering Committee at the March 9 meeting, discuss the tradeoffs of the Marquam Hill-Hillsdale tunnel relative to the surface alignments on Barbur and Naito and the cut and cover tunnel to Hillsdale. The information in these Key Issues memos will be combined with more detailed evaluation ratings in a Draft Evaluation Report to be released by mid-May 2015. In addition to the evaluation report, TriMet is coordinating with geotechnical consultants to further analyze the risks and impacts associated with the bored and cut-and-cover tunnels under consideration. Key findings from this geotechnical work will be presented at the May 11 Steering Committee meeting and in a technical memo to be released by mid-May.

In July 2015, the Steering Committee will decide both whether to accept this staff recommendation to replace the Marquam Hill tunnel with the Marquam Hill-Hillsdale tunnel and also whether to study the Marquam Hill-Hillsdale tunnel further in a Draft Environmental Impact Statement.

## Hillsdale access

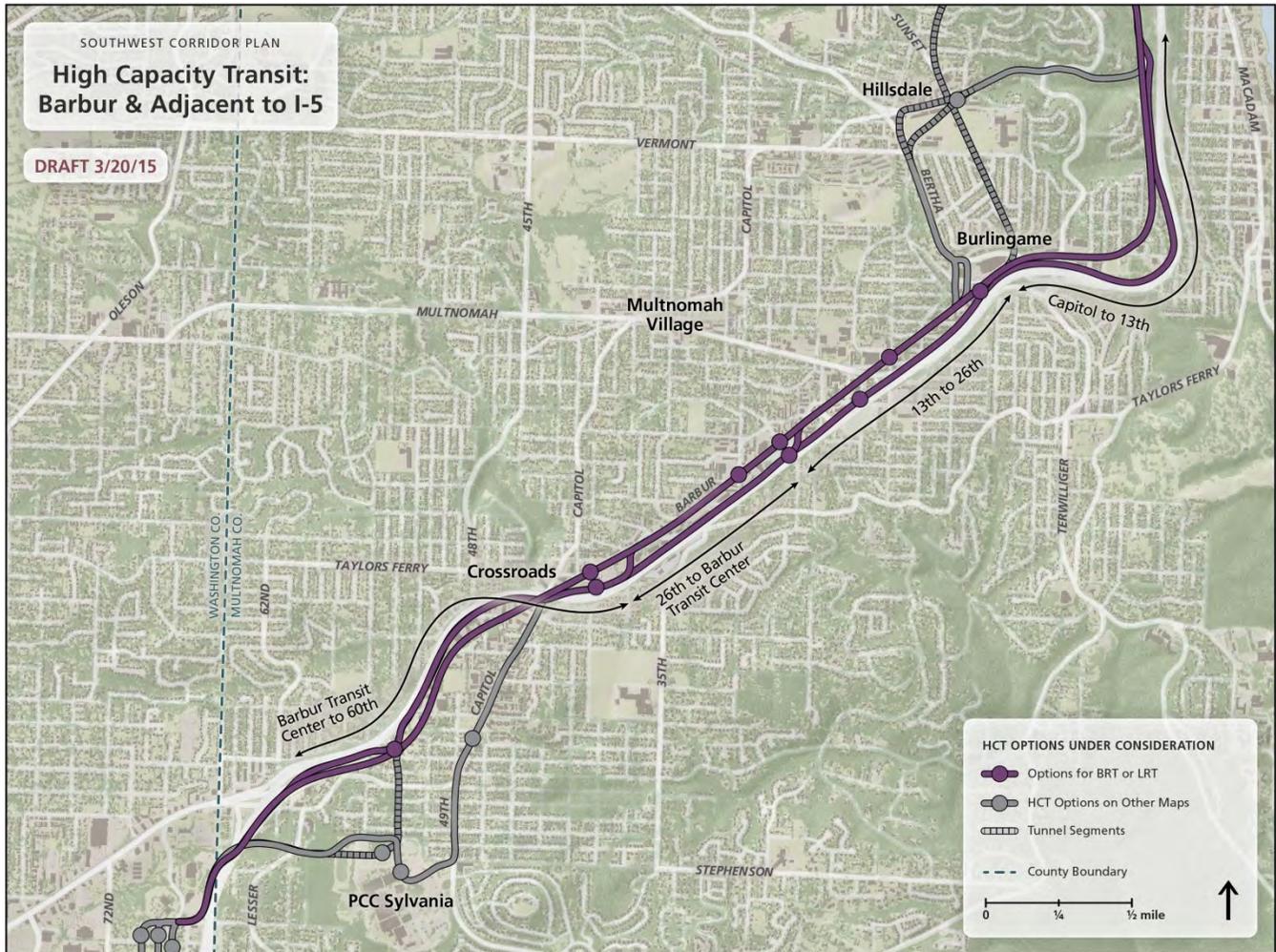


In June 2014, the Steering Committee directed project staff to further explore the costs and benefits of directly serving the Hillsdale town center, and to look at enhanced pedestrian/bicycle connections from a Barbur HCT alignment. In addition, project staff developed a modified cut-and-cover tunnel alignment option, described in more detail later in this memo. The Hillsdale Key Issues memo discusses the tradeoffs between the two cut-and-cover tunnel options, the Marquam Hill-Hillsdale tunnel, and the Barbur surface alignment in more detail.

The list of Shared Investment Strategy roadway and active transportation projects does not currently include an enhanced bicycle and pedestrian connection between Hillsdale and Burlingame HCT station. However, such a connection would be considered with a Barbur HCT alignment in addition to the local bus service improvements. Although Bertha Boulevard already has sidewalks and bike lanes, these could be further enhanced to improve the bike and pedestrian connection between Hillsdale and Burlingame. Bertha has a relatively wide and underutilized right-of-way, which could facilitate widening sidewalks and bike facilities.

In the Southwest Service Enhancement Plan, TriMet has identified promising potential upgrades to local bus lines in Hillsdale. These potential improvements include converting lines 44 and 54 to frequent service, which would include frequencies of 15 minutes or better throughout the weekday and improved service on weekends. These lines connect to Multnomah Village, PCC Sylvania, Beaverton Transit Center and downtown Portland.

## Adjacent to I-5



### *Alignment segments evaluated during focused refinement*

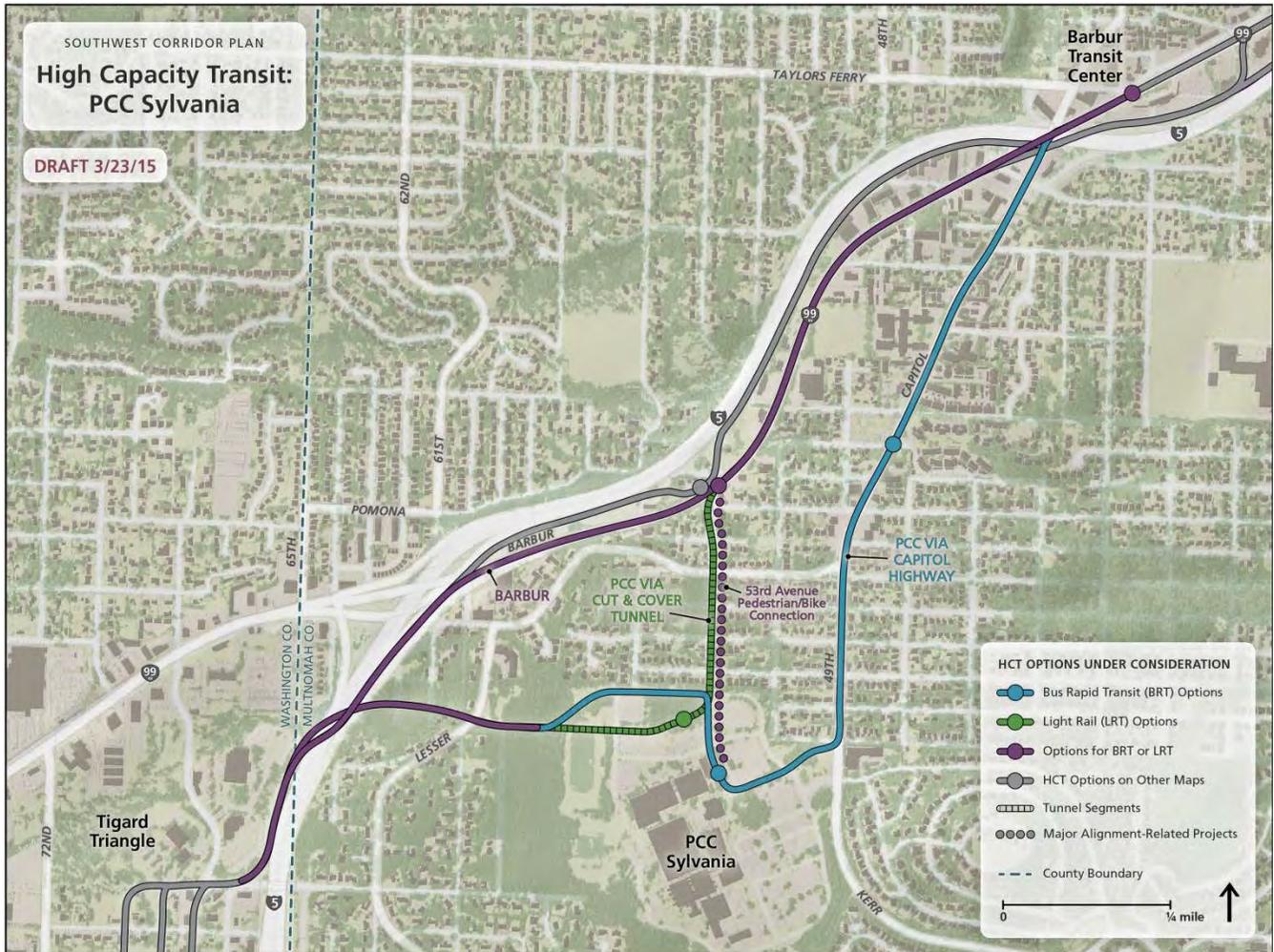
In June 2014, the Steering Committee directed project staff to study the adjacent to I-5 option in more detail than had been covered in the initial refinement phase. During the focused refinement period, the alignment was separated into three segments for further analysis. A new segment south of Barbur Transit Center was identified after the initial focused refinement analysis, resulting in the following four segments:

1. Capitol Highway to 13<sup>th</sup> Avenue
2. 13<sup>th</sup> Avenue to 26<sup>th</sup> Way
3. 26<sup>th</sup> Way to Barbur Transit Center
4. Barbur Transit Center to 60<sup>th</sup> Avenue

### *Next steps*

From the four adjacent to I-5 segments, project staff will develop alignment options to evaluate in a fall 2015 Key Issues memo along with the Barbur Boulevard alignment. Further analysis of the changes in traffic operations with a center-running Barbur Boulevard alignment will be included in the discussion of trade-offs in the Key Issues memo. In December, the Steering Committee will decide which adjacent to I-5 segments should be included in the Draft Preferred Package of transportation investments to study further in a DEIS.

## PCC Sylvania access



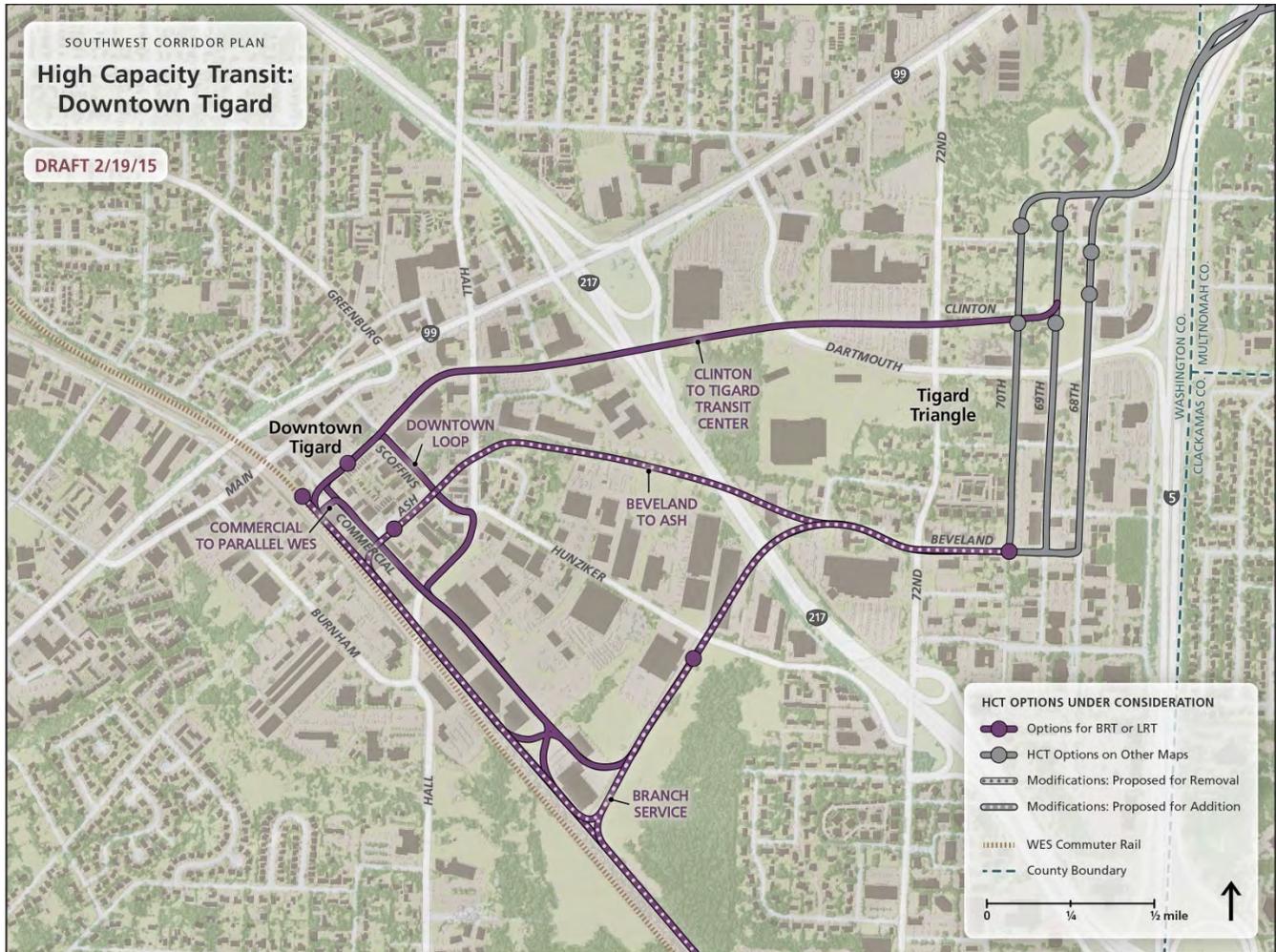
### Summary of work completed

In June 2014, the Steering Committee directed staff to explore the potential of a more robust pedestrian connection from Barbur Boulevard to PCC along SW 53<sup>rd</sup> Ave while also working with PCC and the neighborhood to understand the impacts and benefits of direct service to the campus. Metro has recently hired the Mayer-Reed design firm to develop a conceptual design for enhancing 53<sup>rd</sup> Avenue from Barbur to the PCC Sylvania campus. Project staff is coordinating with PCC as they undertake a visioning process for the Sylvania campus to inform the City of Portland's Comprehensive Plan update.

### Next steps

The 53<sup>rd</sup> Avenue design work is anticipated to be completed by mid-May, allowing for time to review the possibilities of enhanced surface connections to the campus. This design work will be performed concurrent with PCC's visioning work, allowing the public, policy makers and staff to gain a better understanding of transit needs and the benefits of direct transit access to the campus in the future. Options for an enhanced pedestrian and bike connection on SW 53<sup>rd</sup> will be included along with other analysis in the PCC Area Key Issues memo to be completed in May 2015.

## Downtown Tigard



### Alignment options evaluated during focused refinement

In June 2014, the Steering Committee directed project staff to explore opportunities for branched service to minimize travel time to Tualatin and reduce impacts to downtown Tigard. Project staff explored three potential branch service alignments and identified one of these alignments to evaluate further during the 2014 focused refinement period. Additionally, a promising new option emerged, which combined two options that had previously been removed in June 2014: “Beveland north” and “Ash Street.” Including these two new alignments, the options under consideration for downtown Tigard include:

- A. **Downtown loop:** HCT would cross OR-217 at a new bridge curving from Beveland Street to Wall Street, which would also include facilities for cars, bikes, and pedestrians. The alignment would include a station with a new park-and-ride lot near Hunziker Road and Wall. HCT would continue southwest on Wall, then turn towards downtown Tigard along a new street extending southeast from Commercial Street. In downtown Tigard, HCT vehicles would run in a one-way counter-clockwise loop along Commercial, a new road south of Main Street, Scoffins Street and Hall Boulevard. Southbound vehicles would then return to the extension of Commercial Street, and then shift over to parallel the WES tracks near Wall to head toward the Bonita station.

- B. *Commercial to WES alignment:*** As with the downtown loop, HCT would cross OR-217 at a new bridge between Beveland Street and Wall Street, which would include facilities for cars, bikes and pedestrians. The alignment would include a station with a new park-and-ride lot near Hunziker Road and Wall Street. HCT would continue south on Wall, then turn towards downtown Tigard along a new street extending from Commercial Street. Instead of looping through downtown, the Commercial to WES Alignment would run in a one-way counter-clockwise loop along Commercial and parallel to the WES tracks, with a sharp turn near the existing Tigard Transit Center. The downtown Tigard station would be located near this turn.
- C. *Clinton to Tigard Transit Center (TC):*** HCT would run on a structure from 70<sup>th</sup> Avenue and Clinton Street across OR-217 to Hall Boulevard, then along a new street from Hall to Commercial. The alignment would then turn southeast to parallel the WES alignment, with a station near the existing Tigard TC.
- D. *Beveland to Ash:*** HCT would cross OR-217 on a new bridge between Beveland Street, passing behind industrial properties fronting Hunziker and cross Hall at Knoll Drive. This new OR-217 crossing would be open to bicyclists and pedestrians in addition to transit. A new auto, bike, and pedestrian bridge could connect from Beveland to Hunziker near Wall Street, as with the downtown loop and Commercial to WES alignment. From Hall, the alignment would connect to Ash Avenue, with a station on Ash between Scoffins and Commercial, and then turn southeast to parallel the WES tracks. The alignment may provide an opportunity to extend Ash Avenue across the WES and freight rail tracks with a new crossing, pending negotiations with the regulating authorities of the rail corridor.
- E. *Branch Service:*** As with the downtown loop option, HCT would cross OR-217 at a new bridge between Beveland Street and Wall Street, which would include facilities for cars, bikes, and pedestrians. The alignment would include a station with a new park-and-ride lot near Hunziker and Wall. From there, every other HCT vehicle would parallel the WES tracks heading into a terminus in downtown Tigard. These vehicles would reverse direction at the downtown Tigard station, and then return to the Hunziker/Wall station heading northbound to Portland. The other vehicles would parallel the WES tracks heading south toward Tualatin, bypassing the downtown Tigard station.

### *Next steps*

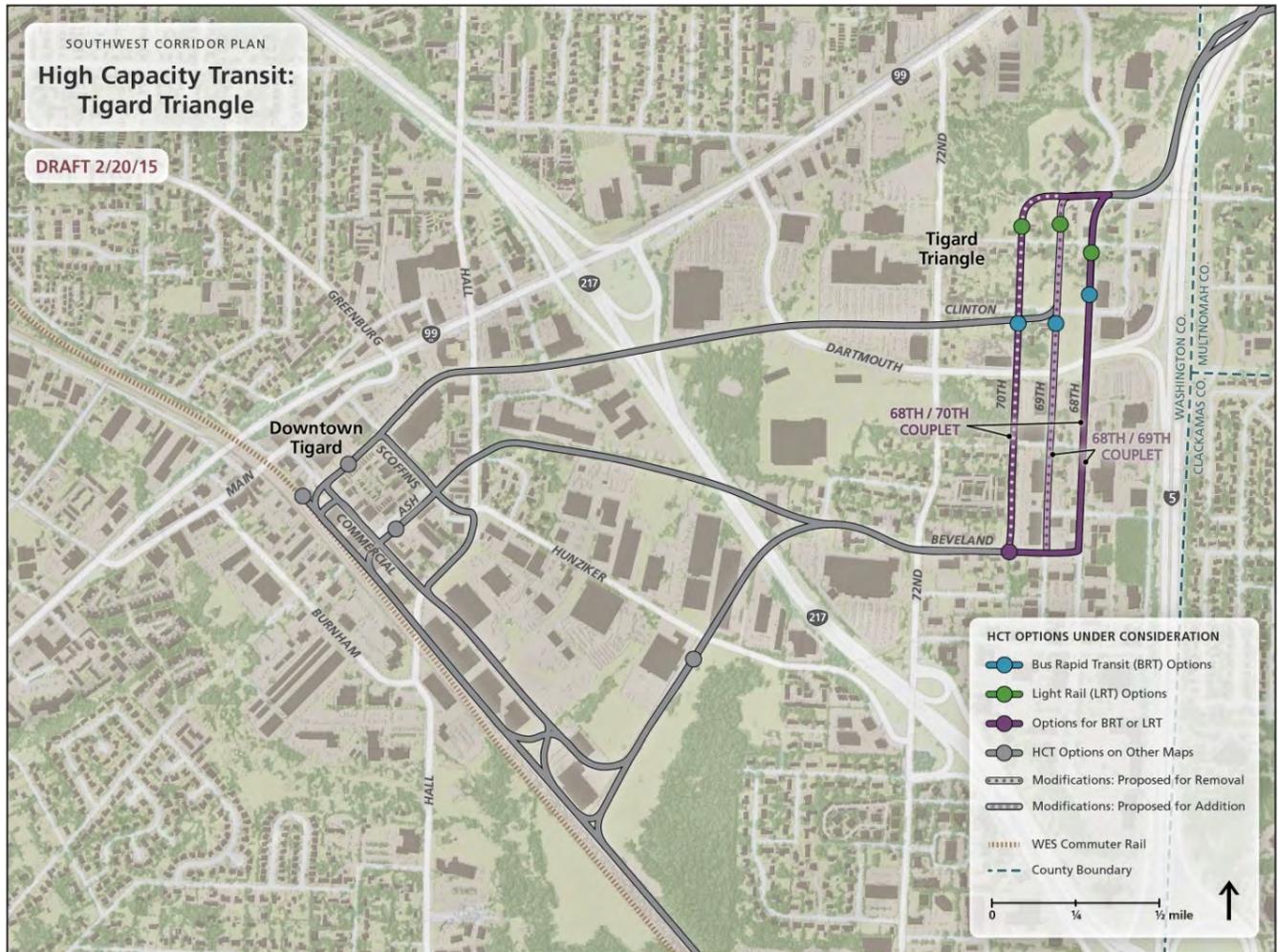
A Key Issues memo with additional information on these five alignment options will be released in July 2015. In December 2015, the Steering Committee will identify the most promising Tigard alignment to include in the draft Preferred Package of transportation investments to study in a Draft Environmental Impact Statement.

## Additional recommended modifications based on technical analysis

1. **Hillsdale:** add cut and cover tunnel alignment south of town center through play fields for both BRT and LRT
2. **Tigard Triangle:** replace 68<sup>th</sup>/69<sup>th</sup> Couplet with 68<sup>th</sup>/70<sup>th</sup> Couplet for both BRT and LRT
3. **Tigard to Bridgeport Village:** shift Tech Center option slightly to the south for both BRT and LRT
4. **Bridgeport Village to Tualatin:** add adjacent to I-5 and freight rail alignment option for both BRT and LRT



## Tigard Triangle



***Proposed modification: replace 68th/69th Avenue couplet with 68th/70th Avenue couplet***

In June 2014, the Steering Committee recommended to continue studying a 68<sup>th</sup>/69<sup>th</sup> Avenue couplet option in the Tigard Triangle and to remove the two-way 68<sup>th</sup> Avenue and 68<sup>th</sup>/70<sup>th</sup> couplet alignments from consideration. Following that decision, significant concerns were raised about how that decision impacted local land use planning that was underway in the Tigard Triangle. After carrying out further analysis during the project's 2014 focused refinement period, project staff recommend that the 68<sup>th</sup>/70<sup>th</sup> couplet alignment replace the 68<sup>th</sup>/69<sup>th</sup> couplet for further study.

The preliminary drawings of the 68<sup>th</sup>/69<sup>th</sup> couplet envisioned 68<sup>th</sup> running northbound and 69<sup>th</sup> running southbound, with HCT along the left side of each street, one lane of auto traffic in the middle, and a bike lane on the right. With this street configuration, access to properties between 68<sup>th</sup> and 69<sup>th</sup> would be limited to driveways connecting to the east-west cross-streets, which would have signalized intersections to allow vehicles to cross the HCT guideway. By shifting the southbound HCT alignment from 69<sup>th</sup> to 70<sup>th</sup>, properties located in between 68<sup>th</sup> and 69<sup>th</sup> would be able to maintain driveway access points along 69<sup>th</sup> as well as the cross-streets. This is an important consideration when viewed through the lens of the ongoing work of the Tigard Triangle Strategic Plan. This planning document identifies 69<sup>th</sup> Avenue as a pedestrian focused street, with wide sidewalks, bike lanes and on-street parking and a focus on ground floor retail uses. The plan specifically calls for

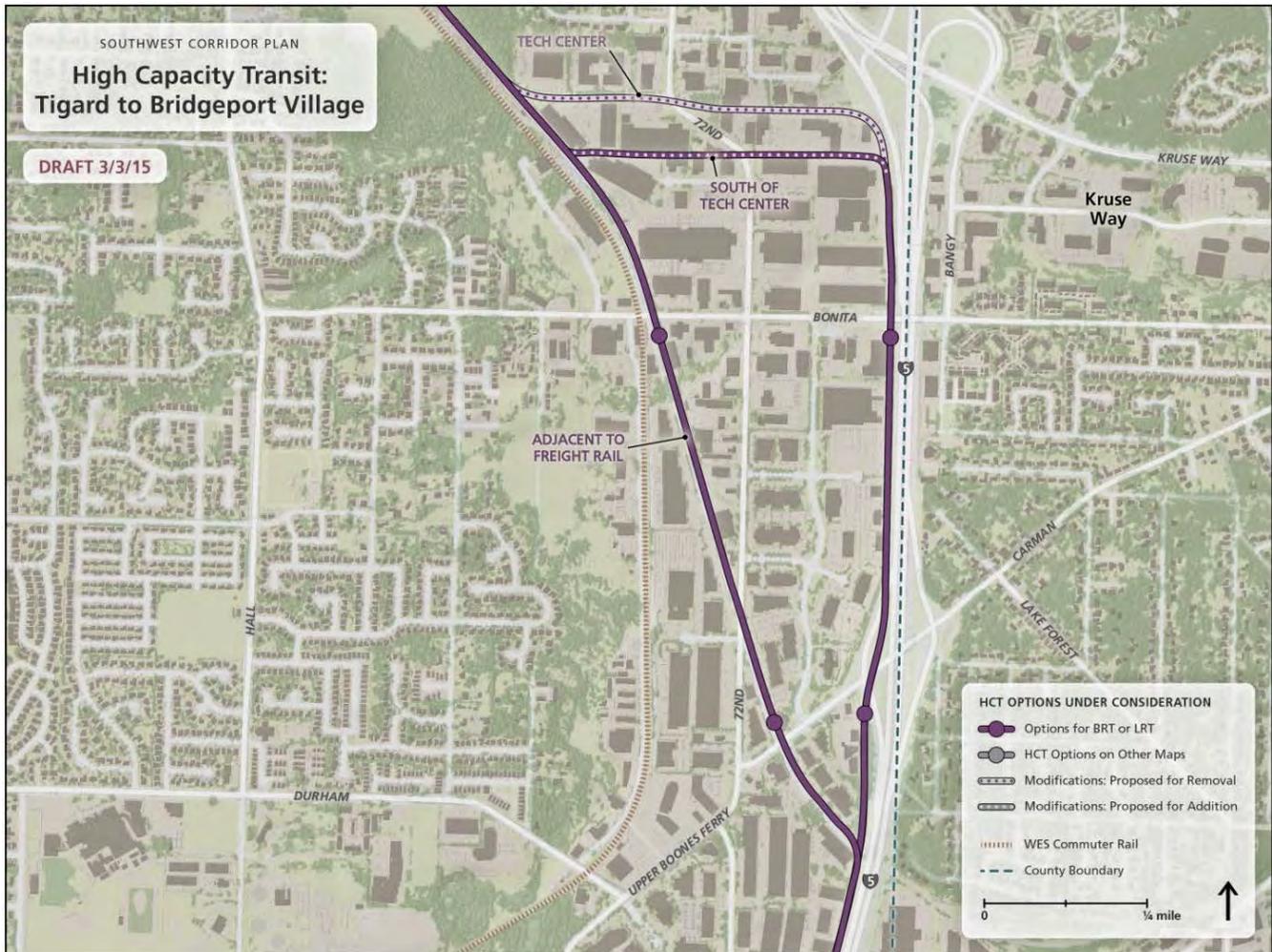
69<sup>th</sup> to be free of any form of HCT, allowing for a focus on slower traffic and a more enjoyable pedestrian and cycling experience. The removal of 69<sup>th</sup> Avenue as a consideration for HCT supports the land uses envisioned in the Tigard Triangle Strategic Plan along the street to become more viable.

In the June 2014 Draft Recommendation, the 68<sup>th</sup>/70<sup>th</sup> couplet option was not recommended for further consideration because it “would require significantly more structure and property acquisition compared to the 68<sup>th</sup>/69<sup>th</sup> couplet due to the narrow width and steep slopes on 70<sup>th</sup> Avenue.” Because 70<sup>th</sup> is not fully connected through the Triangle, and features a narrower right-of-way than 69<sup>th</sup>, the cost of converting 70<sup>th</sup> to a full street would indeed be greater than 69<sup>th</sup>. However, the City of Tigard’s Tigard Triangle Strategic Plan, which is currently under review, also recommends building these new connections along 70<sup>th</sup>. Routing HCT on 70<sup>th</sup> instead of 69<sup>th</sup> would provide an opportunity to leverage federal transit funds for the City’s broader goals for the Tigard Triangle area.

***Next steps***

Further analysis will be completed to confirm the technical feasibility of the 68<sup>th</sup>/70<sup>th</sup> couplet alignment and refine the preliminary cost estimates. In July, the Steering Committee will decide whether to replace the 68<sup>th</sup>/69<sup>th</sup> couplet with the 68<sup>th</sup>/70<sup>th</sup> couplet for further consideration.

## Tigard to Bridgeport Village



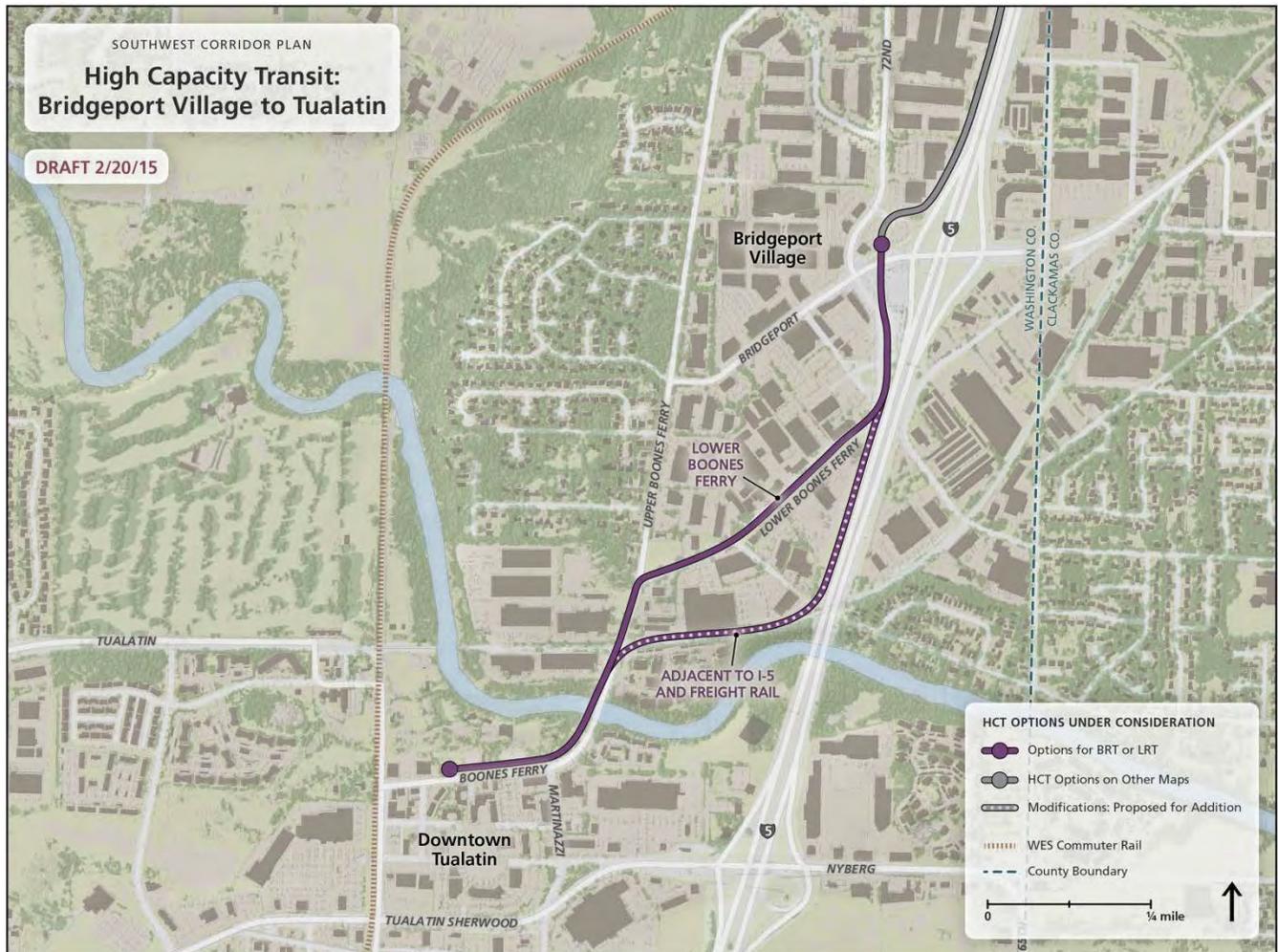
### *Proposed modification: shift Tech Center Drive alignment south to cut between industrial buildings*

After further review, project staff recommend modifying the Tech Center option running from Tigard to Tualatin. The preliminary drawings showed HCT running along Tech Center Drive between the WES tracks and 72<sup>nd</sup> Avenue, then continuing directly west of Tech Center toward I-5. However, access impacts to adjacent properties and the steep slopes along this path added to the engineering complexity and cost of the alignment. Since these initial drawings, project staff have found that running HCT in between the industrial buildings just south of Tech Center, where the slopes are flatter and impacts to access of the adjacent parcels can be minimized, is a more promising alignment.

### *Next steps*

In further study, the alignment will be renamed accordingly: south of Tech Center. This alignment will be evaluated in more detail in the second half of 2015. A Key Issues memo will be released in the fall in anticipation of a December Steering Committee decision on whether to include the south of Tech Center or adjacent to freight rail options in a draft Preferred Package of transportation investments to study in a DEIS.

## Bridgeport Village to Tualatin



### *Proposed modification: add adjacent to I-5 and freight rail option*

In Tualatin, the adjacent to I-5 and freight rail alignment has been developed as an option that avoids impacts to Lower Boones Ferry Road south of Bridgeport Village. This alignment continues along the west side of I-5 from Bridgeport Village, and then turns west to parallel the freight rail tracks between I-5 and Boones Ferry Road. At Boones Ferry the HCT alignment crosses over the freight rail tracks, Boones Ferry, and the Tualatin River on a new bridge. As with the Lower Boones Ferry alignment option, HCT terminates at a station just north of Boones Ferry and the Tualatin Commons.

### *Next steps*

More detailed drawings of the alignment will be developed in the coming months, followed by a cost estimate to consider relative to the Lower Boones Ferry alignment. These two Tualatin options will be evaluated in more detail in a fall 2015 Key Issues memo, in anticipation of a December Steering Committee recommendation on the draft Preferred Package of transportation investments to study in a DEIS.