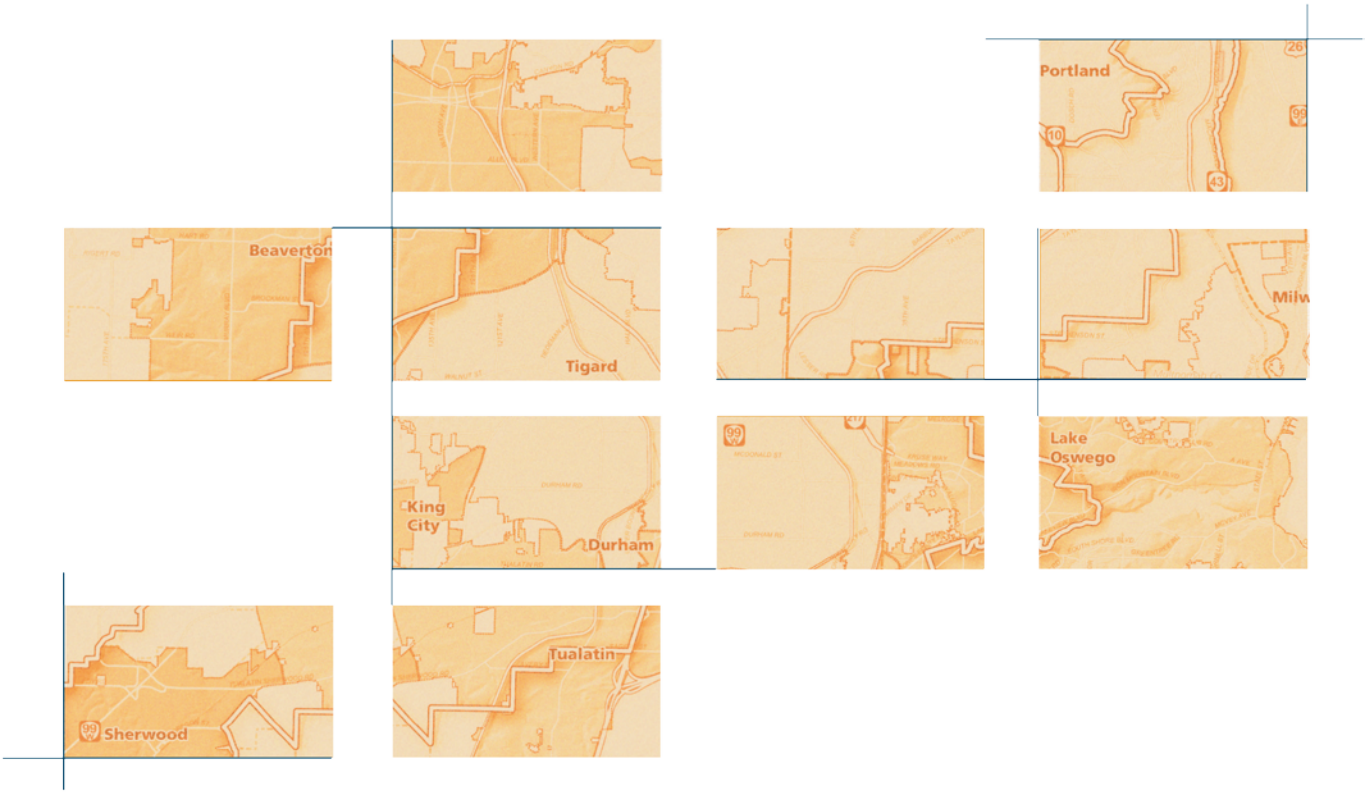


GREAT PLACES
SW Corridor Plan

Appendix C: HCT Options Analysis

May 28, 2014

PROJECT PARTNERS

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

Appendix C: HCT Design Options Analysis

I. PTL recommendation for April removal of HCT design options

This March 31, 2014 memo details the 14 HCT options recommended for early removal by the Project Team Leaders (PTL) group. The recommendation was unanimously endorsed by the Steering Committee at its April 7, 2014 meeting. Page 2.

II. HCT impact assessment documentation

This section includes more complete details of the HCT options analysis summarized in the May 6, 2014 Draft PTL recommendation on HCT design options. It also includes a brief description of preliminary traffic impact analysis. Page 8.

600 NE Grand Ave.
Portland, OR 97232-2736
www.oregonmetro.gov

Metro | *Memo*

Date: Monday, March 31, 2014
To: SW Corridor Plan Steering Committee
From: Matt Bihn, Metro
Subject: PTL recommendation for early removal of HCT design options

Recommendation
The Project Team Leaders group (PTL) recommends the removal of 14 HCT design options from further consideration based on design considerations and public comment.

The attached map and matrix illustrate all options and identify those recommended for removal, and descriptions follow in this memo.

Background
Much of the refinement phase preliminary conceptual design for potential HCT options has been completed. While the design serves as the foundation for additional analysis such as modeling and impacts analysis, the initial design process itself has identified some options to be clearly less viable than competing alternative options. Several Steering Committee representatives recommended that the project team identify options for early removal which appear unlikely to be forwarded into the DEIS based on the design progress.

Public Input
Please refer to *March 2014 Southwest corridor design workshops report* for a summary of public comments regarding this recommendation.

Next Steps
The remaining design options will receive more comprehensive analysis that addresses the following:

- **capital cost magnitudes** – relative cost of construction including design elements such as tunnels, structure, length, and built environment;
- **impacts to the natural environment –** impacts to natural resources including trees, parks, watersheds, including considerations of potential opportunities for improvements;
- **impacts to the built environment –** impacts to existing infrastructure such as bridges and tracks, and assessment of fit with the character of surrounding existing area;
- **development/redevelopment potential –** potential to support the SW Corridor land use vision;
- **property impacts** - effects on buildings and private property;
- **traffic/bike/pedestrian impacts** – effects on roadway operations, bikeways, and sidewalks;
- **transit performance** – assessment of ridership potential and operating costs based on design characteristics such as distance and speed, and household and employment access.

This assessment will inform the May PTL recommendation to the Steering Committee for options to be carried into the Draft Environmental Impact Statement.

Reasons for Proposed Early Removal by Design Option

Tie-In to Existing Service-Downtown: Fourth & Fifth Avenue Couplet (light rail only)

Reasons for proposed removal:

- **impacts to the built environment**
- **high capital costs**

In order for a light rail transit (LRT) option to align with the transit mall the SW 5th Avenue bridge over I-405 would require reconstruction to lower the north abutment by at least five feet, impacting required vehicle clearance on the freeway and ramps below. In addition, a significant portion of the newly constructed Portland-Milwaukie LRT (PMLR) alignment would need to be rebuilt.

Alternative options: Options on Fourth Avenue, First Avenue, and Naito Parkway would require much less extensive modifications to existing infrastructure. For BRT, this option would not require bridge or PMLR reconstruction.

Tie-In to Existing Service - South Waterfront: Long (Bridge)

Reasons for proposed removal:

- **high capital costs, impacts to the built environment**
- **traffic/bike/ped impacts**
- **low development/redevelopment potential**

Extensive structures would be required to connect South Waterfront to SW Barbur Boulevard, including construction of bridges adjacent to and crossing over I-5 and of tunnels to reach grade at SW Barbur Boulevard. An HCT alignment would be squeezed between I-5 and SW Macadam Avenue, potentially constraining future I-5 lane expansion or modifications. Traffic impacts would occur at the southern portal of the tunnel on SW Hamilton Street. The option would provide out-of-direction routing between most of the corridor and the transit mall. Finally, service through already well- served South Waterfront (streetcar, PMLR), would not support redevelopment on SW Naito Parkway or on SW Barbur Boulevard.

Alternative options:
Options using SW Barbur Boulevard or SW Naito Parkway would require much less structure, would provide a more direct path to tie into the transit mall, and would provide more redevelopment opportunities.

PCC Area: Circumferential around south end (Upper Haines)

Reasons for proposed removal:

- **property impacts**
- **impacts to the natural environment**

BRT routing along upper Haines Road would result in significant property impacts and natural environment impacts, affecting private landscaping and old-growth trees along the very narrow roadway, as well as Lesser City Park. LRT routing in this section was removed from consideration previously due to steep grade changes between PCC and the Tigard Triangle, but would also impact the properties, trees, and the park.

Alternative options:
Options with BRT routed to the north of the campus would provide comparable travel times and access, without affecting the upper Haines Road area and with far fewer natural and property impacts.

OR-217 Crossing: Parallel to 72nd

Reasons for proposed removal:

- **traffic/bike/ped impacts**
- **transit performance**
- **high capital costs**

Significant traffic impacts would occur with HCT traveling through or near three currently congested intersections: SW 72nd Avenue & SW Hampton Street, SW 72nd Avenue & OR-217 northbound ramps, and SW 72nd Avenue & SW Hunziker Street. Significant capital costs would result from structure needed to operate on the sharp curve between SW 72nd Avenue and SW Hunziker Street. Transit performance would suffer relative to other options due to slow speeds required to travel through two sharp curves, without providing access to additional riders.

Alternative options:
Any of the four OR-217 crossing options to the north would avoid these intersections completely and would provide faster travel times without compromising access to HCT.

OR-217 Crossing: Irving to Hunziker

Reasons for proposed removal:

- **property impacts**
- **traffic/bike/ped impacts, transit performance**

Property impacts would be significant on the east side of OR-217 due to lack of right-of-way. Traffic impacts would be significant as the HCT bridge would land in or near the currently congested intersection of SW 72nd Avenue & OR-217 ramps and would require an additional traffic signal, further disrupting traffic and violating ODOT standards. Alternative options in this segment could create a new auto connection between downtown Tigard and the Triangle, improving access where this option would impair existing access. Transit performance would be worse relative to alternative HCT options in the Tigard Triangle as this longest option, resulting in out-of-direction travel with longer travel times but without attracting additional riders.

Alternative options:
Any of the four OR-217 crossing options to the north of the SW Hunziker Street bridge would avoid these intersections completely and would provide faster travel times without compromising access to HCT.

Downtown Tigard – Hunziker (LRT only)

Reasons for proposed removal:

- **property impacts**
- **traffic/bike/ped impacts**

Multiple industrial businesses along SW Hunziker Street would be impacted by elimination of access by left turning vehicles due to LRT tracks on SW Hunziker Street. Lack of parallel or crossing streets in this area prevents alternative access to these businesses. The inability to accommodate left turns or to provide reasonable locations for U-turns for larger vehicles would result in trucks circulating through the OR-217 interchange and the SW Hall Boulevard & SW Hunziker Street intersection in order to reach these businesses, causing traffic impacts. BRT could be considered in this segment if operating in mixed traffic, though this option would provide slower service compared to options with BRT in exclusive right of way.

Alternative options:
All other options accessing the Tigard Transit Center would avoid impacts along SW Hunziker Street.

Tigard to Durham: 72nd (out and back on Hunziker)

Reasons for proposed removal:

- **property impacts**
- **traffic/bike/ped impacts**
- **transit performance**

HCT would cross the intersections of SW Hunziker Street & SW 72nd Avenue and SW Varns Street & SW 72nd Avenue, resulting in traffic impacts to an already very congested area including OR-217 ramps. The out-and-back design of this alignment would negatively impact transit performance relative to other options, as travel times would be slower and fewer locations would be served. Property impacts would be incurred by industrial businesses along SW 72nd Avenue, as HCT in exclusive right-of-way would eliminate access by left-turning vehicles. The inability to accommodate left turns or to provide reasonable locations for U-turns for larger vehicles would result in trucks circulating through the area to enter and leave their bases using right turns, exacerbating current congestion. While BRT would theoretically be able to operate in mixed traffic here to avoid those impacts, transit performance would suffer with buses trapped in congestion, and so only BRT in exclusive right-of-way is considered reasonable for this option. Finally, this portion of SW 72nd Avenue was not identified as a key station location.

Alternative options:
Options using the WES alignment or SW Hall Boulevard (to SW Durham Road) would provide faster service without duplicating service area, would avoid the OR-217 ramps, and would avoid SW 72nd Avenue near downtown Tigard.

Tigard to Durham: WES alignment to 85th

Reasons for proposed removal:

- **low development/redevelopment potential**
- **impacts to the natural environment**

HCT operating on an extension of SW 85th Avenue over the Tualatin River and into Tualatin would not serve Bridgeport Village, identified as a key HCT station location in the Southwest Corridor Plan. An extension of SW 85th Avenue as a roadway crossing the Tualatin River was strongly opposed by the community of Tualatin, and the project was removed from the Tualatin Transportation System Plan (TSP). There would be potential impacts to the natural environment including portions of Cook Park, Durham City Park and Tualatin Community Park.

Alternative options:
Options using the WES alignment or SW Hall Boulevard (to SW Durham Road) would serve Bridgeport Village and would not include a Tualatin River crossing near the three parks.

Tigard to Durham: Hall to Bonita to 74th

Reasons for proposed removal:

- **impacts to the built environment (LRT)**
- **high capital costs**
- **low development/redevelopment potential**
- **property impacts**

With LRT, crossing of heavy rail just south of downtown Tigard would require grade separation either by a long tunnel or bridge, as well as changes to the elevation of the SW Hall Boulevard & SW Commercial Street intersection, resulting in very high capital costs. SW Hall Boulevard and SW Bonita Road are mainly low density residential neighborhoods with little or no development/redevelopment opportunities with LRT or BRT. LRT or BRT on SW Bonita would result in property impacts several buildings, and to

landscaping of most properties, along with some impacts to Bonita Park. Additional significant property impacts and constraints to access would occur on SW 74th Avenue due to narrow rights of way.

Alternative options:
Options using the WES alignment would avoid SW Hall Boulevard and SW Bonita Road. BRT on SW Hall Boulevard would not require grade separation crossing heavy rail tracks, and options using SW Durham Road instead of SW Bonita Road would reduce property impacts.

Tigard to Durham: Hall to 85th

Reasons for proposed removal:

- **impacts to the built environment (LRT)**
- **high capital costs**
- **low development/redevelopment potential**
- **impacts to the natural environment**

For LRT, crossing of heavy rail just south of downtown Tigard would require grade separation either by a long tunnel or bridge, as well as changes to the elevation of the SW Hall Boulevard & SW Commercial Street intersection, resulting in very high capital costs. SW Hall Boulevard travels through mainly low density residential neighborhoods with little or no development/redevelopment opportunities with LRT or BRT. HCT LRT or BRT operating on an extension of SW 85th Avenue over the Tualatin River and into Tualatin would not serve Bridgeport Village, identified as a key HCT station location in the Southwest Corridor Plan. An extension of SW 85th Avenue as a roadway crossing the Tualatin River was strongly opposed by the community of Tualatin, and the project was removed from the Tualatin TSP. There would be potential impacts to the natural environment including portions of Cook Park, Durham City Park and Tualatin Community Park.

Alternative options:
Options utilizing the WES right-of-way would not cross the heavy rail line, would avoid SW Hall Boulevard, and would serve Bridgeport Village. These options would not include a Tualatin River crossing near the three parks.

Bridgeport Village: Bridgeport Road via 72nd

Reasons for proposed removal:

- **property impacts, high capital costs**
- **impacts to the natural environment**

With HCT, extensive property impacts would be required to maintain the existing number of lanes on SW Bridgeport Road, with all buildings on one side of the street removed. If the alternative were to include structure to avoid property impacts, high capital costs relative to competing at-grade options would result. This option would continue onto Upper Boones Ferry Road, which would result in natural environment impacts with the removal of many large trees.

Alternative options:
All other options in this segment would avoid Bridgeport Road and associated property impacts. The options on SW 72nd Avenue would also avoid Upper Boones Ferry Road and the impacts to trees.

Tualatin: Adjacent to I-5 and behind Nyberg Rivers

Reasons for proposed removal:

- **impacts to the built environment**
- **high capital costs**

This option requires substantial amounts of structure to tunnel under the heavy rail north of the Tualatin River, as well as a bridge over the river and over the circulation and loading areas located behind the proposed future development at Nyberg Rivers. Additionally, to site a station in downtown Tualatin, the alignment must tunnel under Boones Ferry Road. The option also potentially impacts a planned bike/pedestrian path behind the future development and precludes a potential station location to serve the southern edge of the Bridgeport Village area near Upper and Lower Boones Ferry Roads.

Alternative options:
The options crossing the Tualatin River adjacent to the Lower Boones Ferry Road bridge and turning west would require far less structure and would result in lower costs and fewer visual impacts to the built environment.

Tualatin: Mohawk Park and Ride Terminus

Reasons for proposed removal:

- **impacts to the built environment**
- **high capital costs**

This option would require a very long structure (approximately 2/3 mile long) stretching from the intersection of Upper and Lower Boones Ferry Roads to the north to SW Martinazzi Avenue near SW Warm Springs Street to the south. Such a large structure would result in high capital costs relative to other options without commensurate benefits. A large structure would also impact the built environment as it would not fit with the character of downtown Tualatin.

Alternative options:
The options crossing the Tualatin River adjacent to the Lower Boones Ferry Road bridge and turning west instead of continuing south would require far less structure and would result in lower costs and fewer visual impacts to the built environment.

Appendix C, II: HCT options impact assessment documentation

1. HCT Options

Appendix C, II includes more complete details of the HCT options analysis summarized in the May 6, 2014 Draft PTL recommendation on HCT design options.

It is organized into sections representing nine geographic segments:

1. Tie-in to existing transit;
2. South Portland to Barbur Transit Center;
3. PCC Area;
4. Tigard Triangle;
5. OR-217 Crossing;
6. Downtown Tigard;
7. South Tigard;
8. Bridgeport Village;
9. Tualatin.

Each section includes the following:

- **HCT design option map(s)**: These maps identify all of HCT design options under consideration along with recommended station locations. HCT design options are classified by recommendation status: recommended for advancement into the Draft Environmental Impact Statement (DEIS), not recommended, or requiring more discussion. Sections 1, 2, 3, and 6 include separate maps for BRT and LRT options; the remaining sections, where BRT and LRT options are identical, include a single map representing options for both modes.
- **A brief narrative** characterizing the HCT options in the geographic segment.
- **A list of options by category:** HCT options are grouped by category: recommended, not recommended, or flagged for further discussion. Each option lists of identified opportunities and constraints learned through design, analysis, and public input.

2. Traffic Impacts

As part of the refinement work for SW Corridor, a preliminary traffic impact analysis was performed for the potential transit project. The purpose of the preliminary traffic impact analysis was to evaluate the potential traffic impacts and identify both areas of expected traffic impact and preliminary solutions to address the impacts. The traffic analysis was conducted following the documented Methods and Assumptions for the project, as agreed upon with the Oregon Department of Transportation. The analysis was focused on key intersections of concern based on a wide range of conceptual high-capacity transit (HCT) alignments.

The traffic impact analysis evaluated approximately 50 key intersections along the corridor between Portland and Tualatin. Each intersection was evaluated for existing and future (year 2035) conditions during the PM peak hour, and approximately 15 of the intersections were also evaluated during the AM peak hour. For each intersection, the volume-to-capacity (V/C) ratio, or percentage of the available capacity used by traffic, was determined for 2013 existing conditions, 2035 no-build (also called low-build) conditions, and 2035 build conditions (with the transit project). The 2035 build conditions were assumed to include modifications to traffic lane configurations as needed to accommodate high-capacity transit.

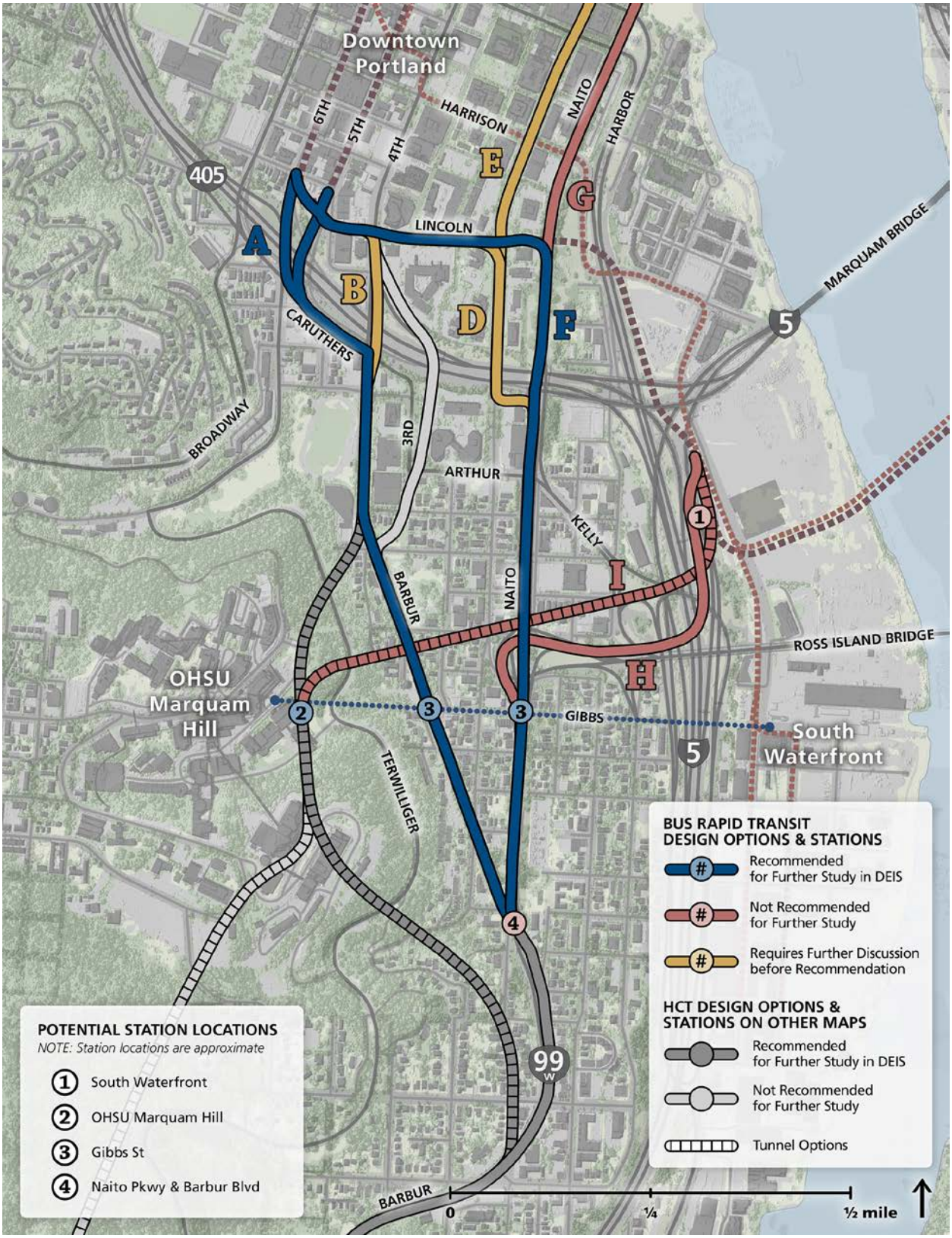
The evaluation identified several locations where the design during the DEIS phase should carefully consider traffic patterns to avoid negatively impacting the transportation system. These locations include:

- Access to downtown Portland
- West end of Ross Island Bridge
- Intersection of Barbur Boulevard & SW Hamilton Street
- Intersection of Barbur Boulevard & SW Capitol Highway & I-5 SB on-ramp, also called "Crossroads"
- Intersection of SW 72nd Avenue and SW Beveland Street

In general, traffic is expected to operate acceptably in 2035 with the addition of high capacity transit. In cases where traffic demand is expected to exceed capacity in 2035, the addition of high capacity transit is not expected to worsen conditions compared to the no-build in most cases, and in some cases results in improved operations. In several instances, more detailed analysis during the DEIS will be required to determine whether traffic impacts will be acceptable with the addition of high capacity transit, or whether additional traffic mitigation would be necessary to maintain acceptable operations. In all cases, potential solutions are available, such as intersection or roadway reconfiguration, the addition or reconfiguration of travel lanes, or grade separation of transit.

A report will be completed in June 2014 summarizing the results of the traffic impact analysis.

1. Tie-In to Existing Transit – BRT



1. Tie-In to Existing Transit – BRT

The design options recommended for further study would have two distinctly different goals: Barbur via a 5th/6th Avenue couplet would provide the fastest connection to the transit mall, while the Naito option would support redevelopment of the South Portland neighborhood. All Barbur and Naito options would include an elevator/bridge serving Marquam Hill/OHSU/VA Hospital from the vicinity of SW Barbur and SW Gibbs Street. The elevator/bridge along with an improved crossing of Naito would complete the connection between OHSU's Marquam Hill and South Waterfront campuses and allow HCT on Barbur or Naito to serve both campuses.

Recommended for Further Study

A.Barbur via 5th/6th Avenue couplet

This design option would connect SW Barbur Boulevard to the transit mall using SW 5th and 6th Avenues. Southbound buses from the transit mall would cross the 5th Avenue Bridge over I-405 and continue south on Broadway to SW 4th Avenue, connecting to SW Barbur. Currently, Broadway and SW 4th Avenue are eastbound- and northbound- only, respectively; a new bus-only lane would provide access to BRT and avoid most traffic issues on the area. Northbound buses would travel from SW 4th (south of I-405) to SW Broadway in the far right lane in mixed traffic to the SW 6th Avenue bridge to the transit mall.

Opportunities – the option would:

- Provide the fastest connection to CBD and transit mall with the highest proportion of dedicated guideway at the peak load point of the line (the highest ridership location);
- Provide the least expensive BRT connection;
- Avoid Ross Island Bridgehead traffic;
- Provide a connection to tunnel options;
- Cost an estimated $34M (2014$) less than Naito to transit mall, excluding a Ross Island Bridgehead project.

Constraints – the option would:

- Not include Naito or Ross Island Bridgehead multimodal improvements.

F. Naito to Transit Mall

This design option would utilize roadway adjacent to Portland-Milwaukie LRT tracks between transit mall and SW Naito Parkway Avenue. At SW Naito Parkway, the alignment would diverge from SW Lincoln Street to the south, crossing over the existing SW Naito Parkway I-405 overpass and continuing along SW Naito Parkway to SW Barbur Boulevard.

Opportunities – the option would:

- Potentially redesign SW Naito Parkway and the Ross Island Bridgehead to change traffic patterns, establish complete multimodal facilities in the context of a reconnected grid of streets and convert land for redevelopment;
- Avoid intersections along SW Broadway south of I-405.

Constraints – the option would:

- Provide a less direct connection to transit mall compared to Barbur options, using SW Lincoln Street or a substitute route, with less potential for traffic-segregated BRT routing;
- Convert a southbound travel lane to an exclusive HCT lane on Naito from Ross Island Bridge to Barbur, according to current design;
- Potentially impact traffic through Ross Island Bridgehead area if roadway realignments not completed in conjunction with HCT project.

Further Discussion Required

B. Barbur via 4th Avenue

This design option would connect SW Barbur Boulevard to the transit mall via the SW 4th Avenue bridge.

Opportunities – the option would:

- Avoid SW Broadway intersections with SW 5th and 6th Avenues;
- Provide a connection for tunnel options.

Constraints – the option would:

- Not provide a direct and dedicated connection to the transit mall;
- Not include Naito or Ross Island Bridgehead multimodal improvements.

D. Naito to transit mall via SW 1st Avenue

This option would be similar to the Naito to Transit Mall option, but diverting from SW Naito Boulevard onto SW 1st Avenue between SW Sheridan Street and SW Lincoln Street.

Opportunities – the option would:

- Potentially redesign SW Naito Parkway and the Ross Island Bridgehead and SW Naito Parkway;
- Avoid traffic on Naito north of Sheridan (but not with Ross Island Bridgehead project, which would increase traffic on SW 1st Avenue):
- Would result in relatively few property impacts on SW 1st Avenue to SW Sheridan Street due to wide right-of-way

Constraints – the option would:

- Provide a less direct connection to transit mall compared to Barbur options, using SW Lincoln Street or a substitute route, with less potential for a dedicated HCT alignment at the peak load point;
- Convert a southbound travel lane to an exclusive HCT lane on Naito from Ross Island Bridge to Barbur, according to current design;

- Slow BRT operations and create some rider discomfort due to number of tight turns from Naito to Sheridan to 1st to Lincoln
- Potentially impact traffic through Ross Island Bridgehead area if roadway realignments not completed in conjunction with HCT project.

E. Naito to transit mall via SW 1st Avenue extended downtown

South of SW Lincoln Street, this design option would be identical to the Naito to transit mall via SW 1st Avenue Option. Instead of utilizing SW Lincoln Street to access the transit mall, the option would continue BRT along SW 1st Avenue, using an unspecified alternative to Lincoln Street (potentially Jefferson and Columbia) to access the transit mall.

Opportunities – the option would:

- Use an alternative to SW Lincoln Street, which will have increased bus traffic when the Tillikum Crossing is in operation (Fall 2015), and to portions of the transit mall;
- Support the City of Portland's Central City Plan;

Constraints – the option would:

- Affect traffic operations on SW 1st Avenue, which is currently one-way southbound;
- Likely require BRT to operate in mixed traffic, resulting in slower travel times and less reliable service at the peak load point;
- Provide less convenient transfer opportunities compared to transit mall options;
- Serve less employment compared to transit mall options and would not serve PSU directly;
- Constrain ability to make modifications to Ross Island bridgehead which would use SW 1st Avenue to distribute traffic displaced on SW Naito Parkway;
- Convert a southbound travel lane to an exclusive HCT lane on Naito from Ross Island Bridge to Barbur, according to current design;
- Potentially impact traffic through Ross Island Bridgehead area if roadway realignments not completed in conjunction with HCT project.

Not Recommended

H. South Waterfront – bridge/tunnel to Naito

The alignment would travel from the transit mall to South Waterfront via SW Harrison Street and SW River Parkway or via SW Lincoln Street and the new Portland-Milwaukie LRT Harbor structure, entering a tunnel under I-5 ramps near the new OHSU/OUS Collaborative Life Sciences building and PMLR station. The BRT would travel generally west in the tunnel underneath the Ross Island Bridgehead and south under SW Naito Parkway and Barbur Boulevard, surfacing near SW Barbur Boulevard and SW Abernathy Street.

Opportunities – the option would:

- Provide a direct connection between the corridor and South Waterfront;
- Provide opportunity for a station near Gibbs/Whitaker and Naito

Constraints – the option would:

- Provide an indirect connection between the transit mall and the corridor;
- Require significant structure (bridges and/or tunnels) that would be very expensive;
- Cause significant construction impacts near OHSU's Collaborative Life Sciences Building and planned Schnitzer campus, streetcar, Portland-Milwaukie LRT, I-5 mainline and ramps, and the Ross Island bridgehead ramps.

I. South Waterfront – tunnel to OHSU

The alignment would travel from the transit mall to South Waterfront via SW Harrison Street and SW River Parkway or via SW Lincoln and the new Portland-Milwaukie LRT Harbor structure, entering a tunnel north of the new OHSU/OUS Collaborative Life Sciences building and PMLR station. The BRT would travel west in the tunnel and connect to one of the other tunnel options (in Segment 2: South Portland to Barbur Transit Center) at an OHSU station.

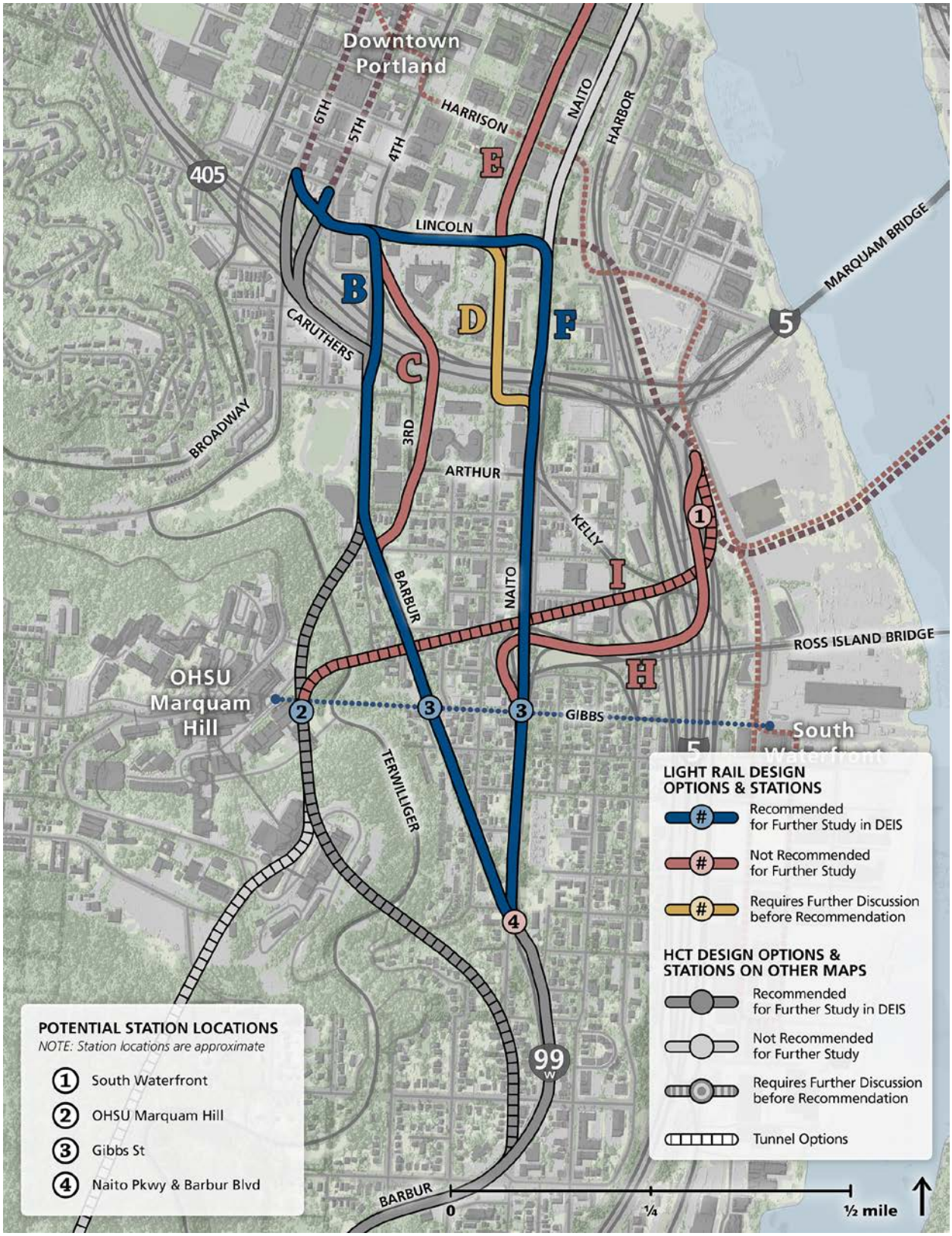
Opportunities – the option would:

- Provide a connection between the corridor and South Waterfront that avoids SW Barbur and SW Naito;
- Provide a direct transit connection between OHSU campuses in addition to the tram;
- Provide a potential future BRT connection between the corridor and the eastside via the new Tillikum Crossing.

Constraints – the option would:

- Provide an indirect connection between the transit mall and the corridor;
- Result in very high costs;
- Cause significant construction impacts near OHSU's Collaborative Life Sciences Building and planned Schnitzer campus, streetcar, and Portland-Milwaukie LRT, I-5 mainline and ramps, and the Ross Island bridgehead ramps.
- Not provide a station to serve the Lair Hill neighborhood in South Portland.

1. Tie-In to Existing Transit – LRT



1. Tie-In to Existing Transit – LRT

The design options recommended for further study would have two distinctly different goals: Barbur via SW 4th Avenue would provide the fastest connection to the transit mall, while the Naito option would support redevelopment of the South Portland neighborhood. All Barbur and Naito options would include an elevator/bridge serving Marquam Hill/OHSU from the vicinity of SW Barbur and SW Gibbs Street. The elevator/bridge along with an improved crossing of Naito would complete the connection between OHSU's Marquam Hill and South Waterfront campuses and allow HCT on Barbur or Naito to serve both campuses. Naito options would be incompatible with OHSU tunnel options.

Recommended for Further Study

B. Barbur via 4th Avenue

This design option would utilize Portland-Milwaukie LRT tracks for one block between the transit mall and SW 4th Avenue, where it would turn south and travel on a new structure parallel to the existing SW 4th Avenue overpass. South of I-405, it would travel on SW Fourth Avenue to SW Barbur Boulevard

Opportunities—the option would:

- Provide the fastest connection to the CBD and transit mall at the peak load point of the line (the highest ridership location);
- Provide the least expensive LRT connection;
- Provide the best connection for tunnel options;
- Avoid Ross Island Bridgehead traffic.

Constraints – the option would:

- Require a new transit-only bridge over I-405 to accommodate HCT

F. Naito to Transit Mall

This design option would utilize Portland-Milwaukie LRT tracks between transit mall and SW Naito Parkway Avenue, sharing the SW Lincoln Street station. At SW Naito Parkway, the alignment would diverge from SW Lincoln Street to the south, crossing over the existing SW Naito Parkway overpass over I-405 and continuing along SW Naito Parkway to SW Barbur Boulevard.

Opportunities – the option would:

- Potentially redesign SW Naito Parkway and the Ross Island Bridgehead to change traffic patterns, establish complete multimodal facilities in the context of a reconnected grid of streets and convert land for redevelopment;
- Avoid intersection along SW Broadway south of I-405.

Constraints – the option would:

- Provide a less direct connection to transit mall compared to Barbur options;
- Require reconstruction of PMLR track and change of elevation of Naito; this could also affect streetcar tracks to the north or require a design exception for the steepness of the roadway ;

- Convert a southbound travel lane to an exclusive HCT lane on Naito from Ross Island Bridge to Barbur, according to current design;
- Potentially impact traffic through the Ross Island Bridgehead area if roadway realignments are not completed in conjunction with HCT project.

Further Discussion Required

D. Naito to transit mall via SW 1st Avenue

This option would be similar to the Naito to Transit Mall option, but diverting from SW Naito Boulevard onto SW 1st Avenue between SW Sheridan Street and SW Lincoln Street.

Opportunities – the option would:

- Potentially redesign SW Naito Parkway and the Ross Island Bridgehead;
- Avoid traffic on Naito north of Sheridan (but not with Ross Island Bridgehead project, which would increase traffic on SW 1st Avenue).

Constraints – the option would:

- Provide a less direct connection to transit mall compared to Barbur options;
- Require reconstruction of PMLR track at SW 1st Avenue and SW Lincoln Street. Track modifications could result in more significant impacts to existing PMLR track work than Naito options due to need for establishing a vertical tangent at the switch point.
- Potentially have a ROW landscape impact on the 300 unit condo development to south of the Lincoln alignment at SW 4thAvenue.
- Slow LRT operations and create some rider discomfort due to number of tight turns from Naito to Sheridan to 1st to Lincoln
- Convert a southbound travel lane to an exclusive HCT lane on Naito from Ross Island Bridge to Barbur, according to current design;
- Potentially impact traffic through Ross Island Bridgehead area if roadway realignments not completed in conjunction with HCT project.

Not Recommended

C. Barbur via 4th Ave/Second Ave

The design option would utilize Portland-Milwaukie LRT tracks between transit mall and SW 4th Avenue, where it would turn to the southeast, travelling parallel to the I-405-SW 4th Avenue off-ramp. It would cross I-405 on a new bridge and continue south parallel to SW 3rd Avenue, entering a tunnel near the intersection of SW 3rd Avenue and SW Arthur Street. The tunnel would either connect to an OHSU tunnel or would surface near SW Barbur Boulevard near SW Woods Street.

This option was originally developed as an alternative to the Barbur via 4th Avenue option if that option were deemed untenable due to potential conflicts with traffic in the vicinity of SW Broadway and SW 4th

Avenue. Preliminary traffic analysis, however, indicates that both HCT and traffic could operate functionally with the Barbur via 4th Avenue option.

Opportunities – the option would:

- Provide a good connection to transit mall for LRT;
- Avoid intersections along SW Broadway south of I-405;
- Provide a good connection to OHSU tunnel options.

Constraints – the option would:

- Require a new long bridge over I-405 and a tunnel at high cost without significant advantages over alternative options;
- Result in significant property impacts along SW 3rd Avenue.

E. Naito to SW 1st Avenue extended downtown

South of SW Lincoln Street, this design option would be identical to the Naito to SW First Avenue option. Instead of utilizing SW Lincoln Street to access the transit mall, however, light rail would continue along SW 1st Avenue to the north, until it tied in to existing Blue/Red LRT line tracks at SW 1st Avenue and SW Morrison/ SW Yamhill Streets.

Opportunities – the option would:

- Supports City of Portland's Central City Plan, which promotes household growth near the waterfront in downtown Portland;
- Could potentially result in faster travel times through downtown Portland to eastside by providing a more direct path to Steel Bridge if transit signal priority is given over autos at the Hawthorne Bridgehead.

Constraints – the option would:

- Cause traffic impacts on SW 1st Avenue, which is currently one-way southbound, with conversion of auto lanes for transit use;
- Cause conflicts with auto traffic in the CBD, especially at the Hawthorne Bridgehead where either LRT or outbound traffic would lose signal priority;
- Provide less convenient transfer opportunities compared to transit mall options, which could affect ridership;
- Serve less employment compared to transit mall options;
- Constrain ability to make modifications to Ross Island bridgehead which would use SW 1st Avenue to distribute traffic displaced on SW Naito Parkway;
- Convert a southbound travel lane to an exclusive HCT lane on Naito from Ross Island Bridge to Barbur, according to current design;
- Potentially impact traffic through Ross Island Bridgehead area if roadway realignments not completed in conjunction with HCT project.

H. South Waterfront – bridge/tunnel to Naito

The alignment would utilize Milwaukie LRT tracks between the transit mall and South Waterfront, diverging from Milwaukie LRT north of the new OHSU/OUS Collaborative Life Sciences building and PMLR station. The alignment would enter a tunnel under I-5 ramps that would travel generally west underneath the Ross Island Bridgehead and south under SW Naito Parkway and Barbur Boulevard, surfacing near SW Barbur Boulevard and SW Abernathy Street.

Opportunities – the option would:

- Provide a direct connection between the corridor and South Waterfront
- Provide opportunity for a station near Gibbs/Whitaker and Naito
- Tie into Portland-Milwaukie LRT tracks under construction

Constraints – the option would:

- Provide an indirect connection between the transit mall and the corridor;
- Require significant structure (bridges and/or tunnels) that would be very expensive;
- Cause significant construction impacts near OHSU's Collaborative Life Sciences Building and planned Schnitzer campus, streetcar, Portland-Milwaukie LRT, I-5 mainline and ramps, and the Ross Island bridgehead ramps.

<u>I. South Waterfront – tunnel to OHSU</u>

The alignment would utilize Portland-Milwaukie LRT tracks between the transit mall and South Waterfront, diverging from Milwaukie LRT north of the new OHSU/OUS Collaborative Life Sciences building and PMLR station. The alignment would enter a tunnel turning west and connecting to one of the other tunnel options (in Segment 2: South Portland to Barbur Transit Center) at an OHSU station.

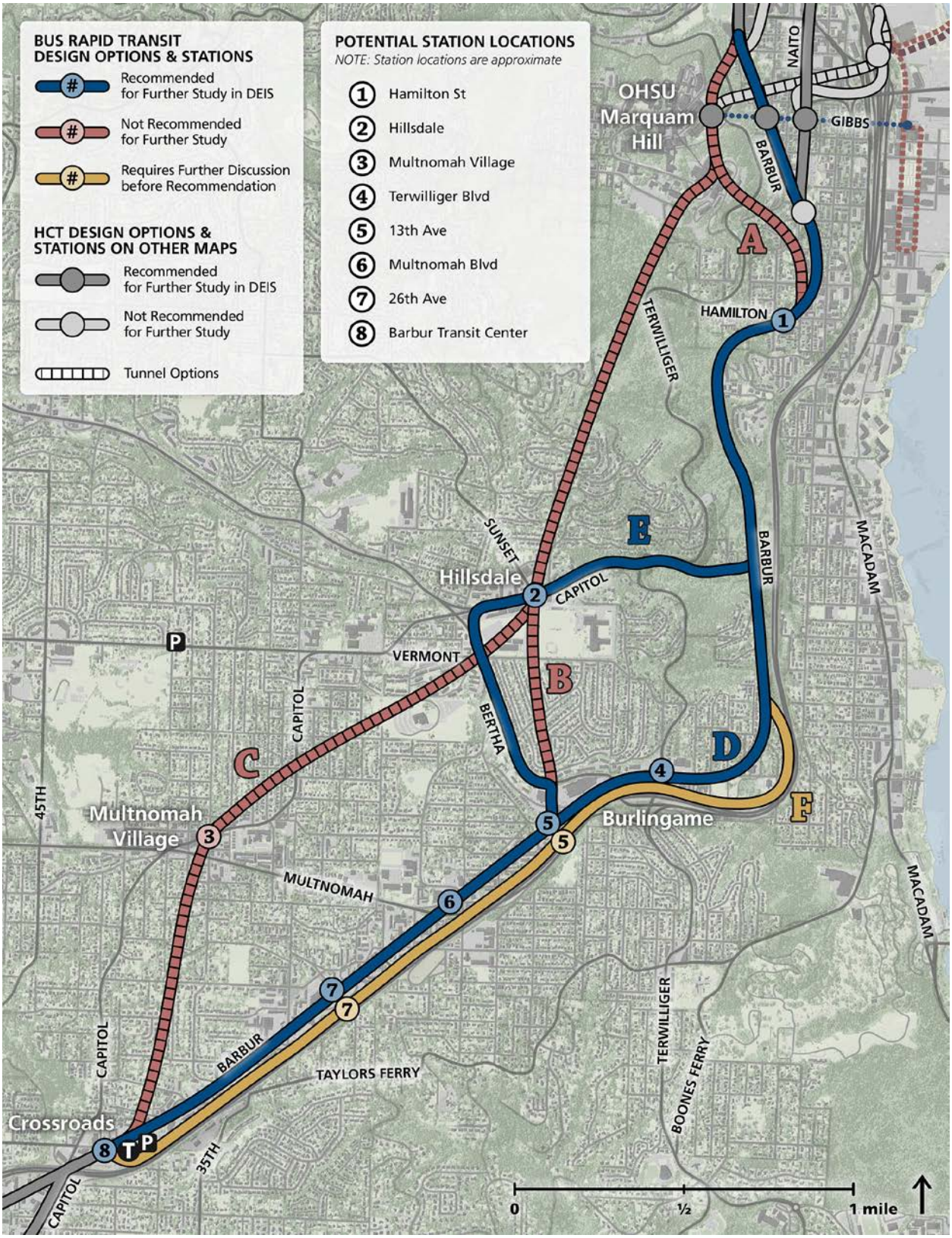
Opportunities – the option would:

- Provide a connection between the corridor and South Waterfront that avoids SW Barbur and SW Naito;
- Tie into Portland-Milwaukie LRT tracks under construction;
- Provide a direct transit connection between OHSU campuses in addition to the tram;
- Provide a potential future LRT connection between the corridor and Portland-Milwaukie LRT corridor via the new Tillikum Crossing.

Constraints – the option would:

- Provide an indirect connection between the transit mall and the corridor;
- Result in very high costs;
- Cause significant construction impacts near OHSU's Collaborative Life Sciences Building and planned Schnitzer campus, streetcar, and Portland-Milwaukie LRT, I-5 mainline and ramps, and the Ross Island bridgehead ramps;
- Not provide a station to serve the Lair Hill neighborhood in South Portland.

2. South Portland to Barbur Transit Center – BRT



2. South Portland to Barbur Transit Center – BRT

Options in this section prioritize either development potential and accessibility (Barbur, Hillsdale Loop options) or physical separation of HCT from traffic (Adjacent to I-5 option, tunnel options).

Recommended for Further Study

D. Barbur Boulevard

The segment of Barbur Boulevard between SW Hamilton Street and SW Brier Place includes the section known as "the Woods," an area with little development and few intersections. Here SW Barbur Boulevard crosses over two wooden structures, the Newberry Viaduct and the Vermont Viaduct, which would not be replaced with BRT. Instead, new parallel bike/pedestrian bridges would be added to the existing structures.

Between Brier Place and the Barbur Transit Center, BRT would travel through several key locations identified in the Barbur Concept Plan. Current designs assume BRT operations in mixed traffic north of the SW Terwilliger Boulevard intersection and over the existing wood viaducts to the Capitol Hwy intersection. While current designs consider conversion of one northbound auto lane north of Capitol Hwy where it connects to northbound Barbur, it is currently assumed that there would be no reduction of auto capacity on SW Barbur Boulevard between SW Capitol Hwy in "the Woods" and the Barbur Transit Center.

Opportunities – the option would:

- Support the City of Portland's Barbur Concept Plan, which identifies HCT as a necessary component of the vision for Barbur Boulevard;
- Include the addition or improvement of sidewalks, bike facilities, storm water features, and other streetscaping;
- Include addition of bike and pedestrian bridges adjacent to the Newbury and Vermont viaducts, which would not require replacement with BRT;
- Cost significantly less than tunnel options and an estimated $44M (2014$) less than the Hillsdale loop BRT option;
- Result in fewer construction impacts to the neighborhood compared to tunnel options that would include significant impacts at both portals—near Duniway Park to the north and near Hamilton Street to the south.

Constraints – the option would:

- Utilize available auto capacity with conversion of one lane in a section of SW Barbur Boulevard between northbound Capitol Highway at Barbur and Hamilton as currently designed;
- Travel through and potentially require mitigation for impacts at key intersections;
- Restrict left-turning vehicle access to some businesses.

E. Barbur – Hillsdale loop using Capitol Hwy & Bertha

This option would diverge from SW Barbur Boulevard between SW Capitol Highway and SW Bertha Boulevard to serve Hillsdale. BRT would travel in mixed traffic through the commercial section of Hillsdale to avoid property impacts or reduction of auto capacity.

Opportunities – the option would:

- Provide HCT service to Hillsdale without a tunnel and without bypassing significant numbers of households or employment where the alignment would diverge from SW Barbur Boulevard;
- Avoid difficult intersections (Terwilliger and Bertha) along SW Barbur Boulevard;
- Potentially include the addition of a new pedestrian/bicycle structure parallel to the Newbury and Vermont viaducts despite the alignment bypassing them.

Constraints – the option would:

- Result in slower travel times compared to the SW Barbur Boulevard option in free-flow conditions, but significantly worse and less reliable travel times when congestion occurs in Hillsdale during peak hours.

Further Discussion Required

F. Adjacent to I-5

BRT would operate on structure to the east of SW Barbur Boulevard in right-of-way parallel to I-5.

Opportunities – the option would:

- Avoid key intersections, traffic, and business accesses along SW Barbur Boulevard;
- Result in faster travel times compared to the SW Barbur option.

Constraints – the option would:

- Require significant structure and bridges to avoid steep slopes, I-5 ramps and bridge crossings;
- Cost more than the Barbur option;
- Provide more limited support for the Barbur Concept Plan;
- Result in more difficult pedestrian connections to stations;
- Not include pedestrian and bike improvements to Barbur Boulevard or along the BRT alignment.

Not Recommended

A. Short Tunnel – Exit at Hamilton

The north portal of this tunnel option would occur near the intersection of SW Barbur Boulevard and SW Hooker Street. The south portal would occur on SW Barbur Boulevard south of SW Hamilton Terrace.

Opportunities – the option would:

- Serve Marquam Hill/OHSU/VA Hospital with a deep station similar to the MAX station at the Oregon Zoo, providing direct access to the upper campus of OHSU;
- Avoid traffic congestion in the northern section of SW Barbur Boulevard;
- Result in reliable travel times.

Constraints – the option would:

- Be very expensive compared to surface options, compromising BRT's capital costs savings compared to LRT;
- Not serve the Lair Hill neighborhood, in contrast to surface options that would include an elevator between Marquam Hill/OHSU and SW Barbur Boulevard in the vicinity of Gibbs Street;
- Preclude walk access to South Waterfront and OHSU's growing South Waterfront Campus (access would require transfer to/from the tram, which is operating near capacity during peak periods);
- Result in severe construction impacts.

B. Medium Tunnel –exit at Bertha

The north portal of the tunnel option would occur near the intersection of SW Barbur Boulevard and SW Hooker Street. The south portal would occur on SW Barbur Boulevard near SW 13th Avenue south of Fred Meyer store.

Opportunities – the option would:

- Serve Marquam Hill/OHSU with a deep station similar to the MAX station at the Oregon Zoo, providing direct access to the upper campus of OHSU;
- Serve Hillsdale;
- Avoid traffic congestion in the northern section of SW Barbur Boulevard but still serve the historic section of SW Barbur Boulevard in support of the Barbur Concept Plan;
- Result in faster and more reliable travel times compared to surface options.

Constraints – the option would:

- Be very expensive compared to surface options;
- Not serve the Lair Hill neighborhood, in contrast to surface options that would include an elevator between Marquam Hill/OHSU and SW Barbur Boulevard in the vicinity of Gibbs Street;
- Preclude walk access to South Waterfront and OHSU's growing South Waterfront Campus (access would require transfer to/from the tram, which is operating near capacity during peak periods);
- Result in severe construction impacts.

C. Long Tunnel-exit at Barbur Transit Center

The north portal of the tunnel option would occur near the intersection of SW Barbur Boulevard and SW Hooker Street. The south portal would occur at the Barbur Transit Center.

Opportunities – the option would:

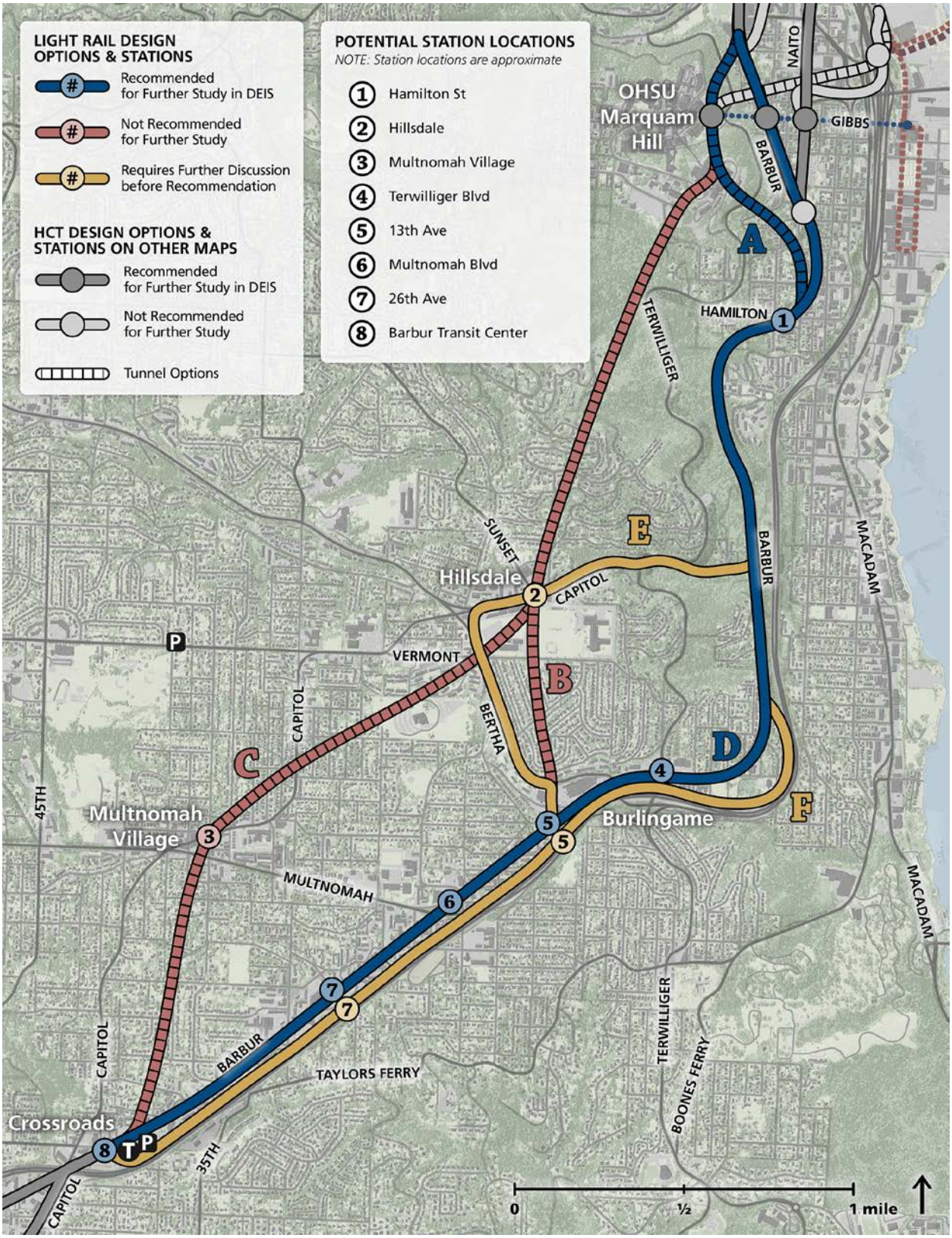
- Serve Marquam Hill/OHSU with a deep station similar to the MAX station at the Oregon Zoo, providing direct access to the upper campus of OHSU;
- Serve Hillsdale and Multnomah Village;
- Avoid traffic congestion on SW Barbur Boulevard between South Portland and the Barbur Transit Center;

- Result in faster and more reliable travel times compared to surface options.

Constraints – the option would:

- Be very expensive compared to surface options;
- Not serve the Lair Hill neighborhood, in contrast to surface options that would include an elevator between Marquam Hill/OHSU and SW Barbur Boulevard in the vicinity of Gibbs Street;
- Not support the Barbur Concept Plan as HCT would bypass the historic section of the boulevard;
- Preclude walk access to South Waterfront (access would require transfer to/from the tram);
- Result in severe construction impacts.

2. South Portland to Barbur Transit Center – LRT



2. South Portland to Barbur Transit Center – LRT

Options in this section prioritize either development potential and accessibility (Barbur, Hillsdale Loop options) or physical separation of HCT from traffic (Adjacent to I-5 option, tunnel options).

Recommended for Further Study

D. Barbur Boulevard

The segment of Barbur Boulevard between SW Hamilton Street and SW Brier Place includes the section known as "the Woods," an area with little development and few intersections. Here SW Barbur Boulevard crosses over two wooden structures, the Newberry Viaduct and the Vermont Viaduct, both of which would need to be replaced to accommodate the width required for dedicated transit lanes and to maintain existing roadway capacity and to add bicycle and pedestrian facilities. Between Brier Place and the Barbur Transit Center, LRT would travel through several key locations identified in the Barbur Concept Plan. While current designs consider conversion of a northbound auto lane between Capitol Hwy and Hamilton in "the Woods", there would be no reduction of auto capacity on SW Barbur Boulevard between SW Capitol Highway (north of the Terwilliger Curves) and the Barbur Transit Center.

Opportunities – the option would:

- Support the City of Portland's Barbur Concept Plan, which identifies HCT as a necessary component of the vision for Barbur Boulevard;
- Include the addition or improvement of sidewalks, bike facilities, storm water features, and other streetscaping;
- Include replacement of the Newbury and Vermont viaducts, complete with sidewalks and bike lanes.
- Cost an estimated $481M (2014$) less than the short tunnel option;
- Result in fewer construction impacts to the neighborhood, compared to tunnel options that would include significant impacts at both portals—near Duniway Park to the north and near Hamilton Street to the south.

Constraints – the option would:

- Utilize available auto capacity with conversion of one lane in a section of SW Barbur Boulevard between northbound Capitol Hwy at Barbur and Hamilton as currently designed;
- Travel through and potentially require mitigation for impacts at key intersections;
- Restrict left-turning vehicle access to some businesses.

A. Short Tunnel – Exit at Hamilton

The north portal of this tunnel option would occur near the intersection of SW Barbur Boulevard and SW Hooker Street. The south portal would occur on SW Barbur Boulevard south of SW Hamilton Terrace.

Opportunities – the option would:

- Serve Marquam Hill/OHSU with a deep station similar to the MAX station at the Oregon Zoo, providing direct access to the upper campus of OHSU;
- Avoid traffic congestion in the northern section of SW Barbur Boulevard;
- Result in reliable travel times.

Constraints – the option would:

- Be very expensive compared to surface options, with an estimated $623M cost
- Not serve the Lair Hill neighborhood, in contrast to surface options that would include an elevator between Marquam Hill/OHSU and SW Barbur Boulevard in the vicinity of Gibbs Street;
- Preclude walk access to South Waterfront (access would require transfer to/from the tram which is operating near capacity during peak periods);
- Result in severe construction impacts.

Further Discussion Required

E. Barbur – Hillsdale loop using Capitol Hwy & Bertha

This option would diverge from SW Barbur Boulevard between SW Capitol Highway and SW Bertha Boulevard to serve Hillsdale. LRT would travel through a cut-and-cover tunnel through the commercial section of Hillsdale to avoid property impacts or reduction of auto capacity.

Opportunities – the option would:

- Provide HCT service to Hillsdale without bypassing significant numbers of households or employment where the alignment would diverge from SW Barbur Boulevard;
- Avoid difficult intersections (Terwilliger and Bertha) along SW Barbur Boulevard;
- Potentially include the addition of a new pedestrian/bicycle structure parallel to the Newbury and Vermont viaducts despite the alignment bypassing them.

Constraints – the option would:

- Result in high construction costs and impacts to businesses during construction due to the tunnel;
- Result in slightly slower travel times compared to the SW Barbur Boulevard option.

F. Adjacent to I-5

LRT would operate on structure to the east of SW Barbur Boulevard in right-of-way parallel to I-5.

Opportunities – the option would:

- Avoid key intersections, traffic, and business accesses along SW Barbur Boulevard;
- Result in faster travel times compared to the SW Barbur option.

Constraints – the option would:

- Require significant structure and bridges to avoid steep slopes, I-5 ramps and bridge crossings;
- Cost an estimated $87M (2014$) more than Barbur option (D.);
- Provide more limited support for the Barbur Concept Plan;
- Result in more difficult pedestrian connections to stations;

- Not include pedestrian and bike improvements to Barbur Boulevard or along the LRT alignment.

Not Recommended

B. Medium Tunnel –exit at Bertha

The north portal of the tunnel option would occur near the intersection of SW Barbur Boulevard and SW Hooker Street. The south portal would occur on SW Barbur Boulevard near SW 13th Avenue south of Fred Meyer store.

Opportunities – the option would:

- Serve Marquam Hill/OHSU/VA Hospital with a deep station similar to the MAX station at the Oregon Zoo, providing direct access to the upper campus of OHSU;
- Serve Hillsdale with a deep station ;
- Avoid traffic congestion in the northern section of SW Barbur Boulevard but still serve the historic section of SW Barbur Boulevard in support of the Barbur Concept Plan;
- Result in faster and more reliable travel times compared to surface options.

Constraints – the option would:

- Be very expensive compared to surface options;
- Not serve the Lair Hill neighborhood, in contrast to surface options that would include an elevator between Marquam Hill/OHSU and SW Barbur Boulevard in the vicinity of Gibbs Street;
- Preclude walk access to South Waterfront (access would require transfer to/from the tram which is operating near capacity during peak periods);
- Result in severe construction impacts near portals at Duniway Park and Bertha/Barbur.

C. Long Tunnel-exit at Barbur Transit Center

The north portal of the tunnel option would occur near the intersection of SW Barbur Boulevard and SW Hooker Street. The south portal would occur at the Barbur Transit Center.

Opportunities – the option would:

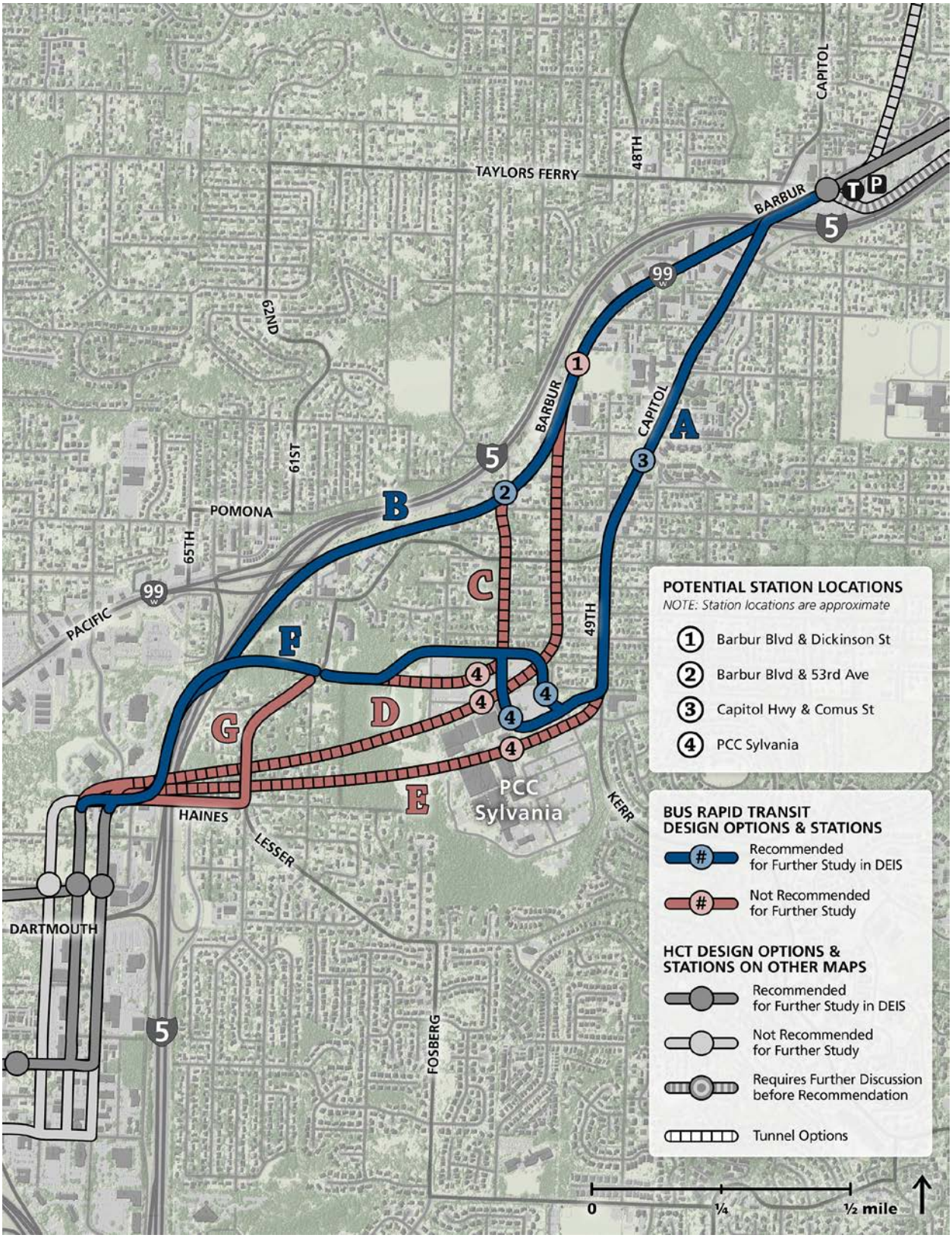
- Serve Marquam Hill/OHSU with a deep station similar to the MAX station at the Oregon Zoo, providing direct access to the upper campus of OHSU;
- Serve Hillsdale and Multnomah Village with deep stations;
- Avoid traffic congestion on SW Barbur Boulevard between South Portland and the Barbur Transit Center;
- Result in faster and more reliable travel times compared to surface options.

Constraints – the option would:

- Be very expensive compared to surface options;
- Not serve the Lair Hill neighborhood, in contrast to surface options that would include an elevator between Marquam Hill/OHSU and SW Barbur Boulevard in the vicinity of Gibbs Street;
- Not support the Barbur Concept Plan as HCT would bypass the historic section of the boulevard;
- Preclude walk access to South Waterfront (access would require transfer to/from the tram which is operating near capacity during peak periods);

- Result in severe construction impacts.

3. PCC Area – BRT



3. PCC Area – BRT

Options in this section are differentiated by how they serve the PCC-Sylvania campus. BRT could serve the campus directly (front door or very short walk) by a surface option via Capitol Highway or by tunnel; the surface option via Barbur would require a longer walk to campus, but would result in a much faster alignment compared to Capitol Highway options, and a much less expensive alignment compared to tunnel options.

Recommended for Further Study

B. Barbur – Crossroads to Tigard (with improved PCC walk via SW 53rd Avenue)

Opportunities – the options would:

- Prioritize travel time, saving approximately four minutes over BRT routes to the PCC campus;
- Feature an improved walk connection to the PCC campus from SW 53rd Avenue, with a raised station, and paving and sidewalks on SW 53rd Avenue. The walk would be slightly less than 1/3 mile uphill to the edge of the PCC property, and nearly ½ mile to PCC buildings;
- Support a new park and ride lot on vacant property north of SW Barbur Boulevard at SW 55th Avenue;
- Support redevelopment opportunities along Barbur Boulevard between Crossroads and SW 60th Avenue.

Constraints – the option would:

- Provide the least direct access to the PCC campus among BRT options;
- Be the least likely to spur redevelopment at the PCC campus.

A. PCC Campus (Front Door or Circumferential around north end)

BRT would diverge from SW Barbur Boulevard at Crossroads, traveling up SW Capitol Highway and SW 49th Avenue. A station would be located directly at the PCC main entrance ("front door"), requiring a transit way through what is currently a campus parking lot, or at the northern edge of the parking lot with a transit way constructed around the existing parking lot. From the campus toward the Tigard Triangle, the route would either use existing roads (Lesser Road and Lower Haines/Atlanta) or a new bridge to cross I-5.

Opportunities – the options would:

- Prioritize accessibility and development potential, serving the PCC-Sylvania campus directly;
- Include an additional station to serve the neighborhood on SW Capitol Highway;

Constraints – the option would:

- Result in longer travel times compared to a Barbur option or tunnel options.

F. New bridge over I-5 (crossing required for Barbur, optional for campus options)

BRT would cross the interstate at a new bridge curving from the intersection of G Street and SW Lesser Road southwest to SW Atlanta Street and 68th Avenue.

Opportunities – the options would:

- Provide faster travel times compared to Lesser/Haines option;
- Minimize disruptions to residential neighborhoods near PCC.

Constraints – the option would:

- Cost more than using existing roads.

Not Recommended

C. Short Tunnel via Barbur, D. Tunnel via Barbur, and E. Tunnel via Capitol Highway

The portals for the short cut-and-cover tunnel would be in the vicinity of SW Barbur Boulevard and SW 53rd Avenue below PCC-Sylvania, and along SW G Street between SW Lesser Road and SW H Street. The option would utilize a new bridge crossing over I-5 to reach the northern section of the Tigard Triangle.

The tunnel via Barbur would have a northern portal in the vicinity of SW Barbur Boulevard and SW 51st Avenue below PCC-Sylvania, and a southern portal near SW 68th Parkway and SW Atlanta Street in the northern section of the Tigard Triangle. It would tunnel under I-5 to reach the Tigard Triangle. This would be a bored tunnel.

The tunnel option via Capitol Highway would diverge from SW Barbur Boulevard at Crossroads, continuing south on SW Capitol Highway toward PCC before entering a tunnel portal near SW 49th Avenue and SW Coronado Street. The southern portal of the bored tunnel would be near SW 68th Parkway and SW Atlanta Street in the northern section of the Tigard Triangle. It would tunnel under I-5 to reach the Tigard Triangle. This would be a bored tunnel.

Opportunities – the options would:

- Serve PCC-Sylvania campus directly;
- Potentially support potential redevelopment of PCC-Sylvania campus.

Constraints – the option would:

- Be very expensive compared to surface options and compromise the cost-savings advantage of the BRT mode over LRT;
- Likely be contingent on changes to the PCC Sylvania Campus Master Plan to accommodate future redevelopment of the campus area.

3. PCC Area – LRT

3. PCC Area – LRT

Options in this section are differentiated by how they serve the PCC-Sylvania campus. Because of the steep topography, LRT could only provide direct service (front door/short walk on campus) to the campus by tunnel. The surface option via Barbur would require a longer walk to campus, but would be much less expensive and disruptive to the neighborhood to construct and would provide a more direct route for riders not accessing PCC.

Recommended for Further Study

B. Barbur – Crossroads to Tigard (with improved PCC walk via SW 53rd Avenue)

Between Crossroads and the Tigard Triangle, HCT would travel entirely along Barbur Boulevard, with a potential park and ride facility located on vacant land between Barbur Boulevard and I-5. PCC would be reached via improved bike/pedestrian access from a station on Barbur Boulevard in the vicinity of SW 53rd Avenue. The station could be raised with a pedestrian bridge across the road to facilitate crossing and to minimize the grade changes. The walk would be slightly less than 1/3 mile uphill to the edge of the PCC property, and nearly ½ mile to PCC buildings. This option would cross I-5 on a new LRT bridge to the northern edge of the Tigard Triangle.

Opportunities – the option would:

- Be the least expensive and fastest LRT option;
- Feature an improved walk and bike connection to the PCC campus from a station near SW 53rd Avenue, potentially with a raised station, and paving and sidewalks on SW 53rd Avenue. The walk would be slightly less than 1/3 mile uphill to the edge of the PCC property, and nearly ½ mile to PCC buildings;
- Support a new park and ride lot on vacant property north of SW Barbur Boulevard at SW 55th Avenue;
- Support redevelopment opportunities along Barbur Boulevard between Crossroads and SW 60th Avenue.

Constraints – the option would:

- Provide the least direct access to the PCC campus among LRT options;
- Utilize available auto capacity on SW Barbur Boulevard south of Crossroads to convert travel lanes for HCT use if traffic analysis is supportiveBe the least likely to spur redevelopment at the PCC campus.

Further Discussion Required

C. Short Tunnel via Barbur

The portals for this cut-and-cover tunnel would be in the vicinity of SW Barbur Boulevard and SW 53rd Avenue below PCC-Sylvania, and along SW G Street between SW Lesser Road and SW H Street. It would utilize a new bridge crossing over I-5 to reach the northern section of the Tigard Triangle.

Opportunities – the option would:

- Serve PCC-Sylvania campus directly;
- Support potential redevelopment of PCC-Sylvania campus;
- Be less expensive compared to longer PCC tunnel options;

Constraints – the option would:

- Result in significant impacts to the neighborhood during construction, as some homes fronting on SW 53rd Avenue would be inaccessible for a period of time;
- Be expensive compared to surface options, costing an estimated $243M (2014$) more than the Barbur option;
- Likely be contingent on changes to the PCC Sylvania Campus Master Plan to accommodate future redevelopment of the campus area.

Not Recommended

D. Tunnel via Barbur and E. Tunnel via Capitol Highway

The bored tunnel via Barbur would have a northern portal in the vicinity of SW Barbur Boulevard and SW 51st Avenue below PCC-Sylvania, and a southern portal near SW 68th Parkway and SW Atlanta Street in the northern section of the Tigard Triangle. It would tunnel under I-5 to reach the Tigard Triangle.

The tunnel option via Capitol Highway would diverge from SW Barbur Boulevard at Crossroads, continuing south on SW Capitol Highway toward PCC before entering a tunnel portal near SW 49th Avenue and SW Coronado Street. The southern portal of the bored tunnel would be near SW 68th Parkway and SW Atlanta Street in the northern section of the Tigard Triangle. It would tunnel under I-5 to reach the Tigard Triangle.

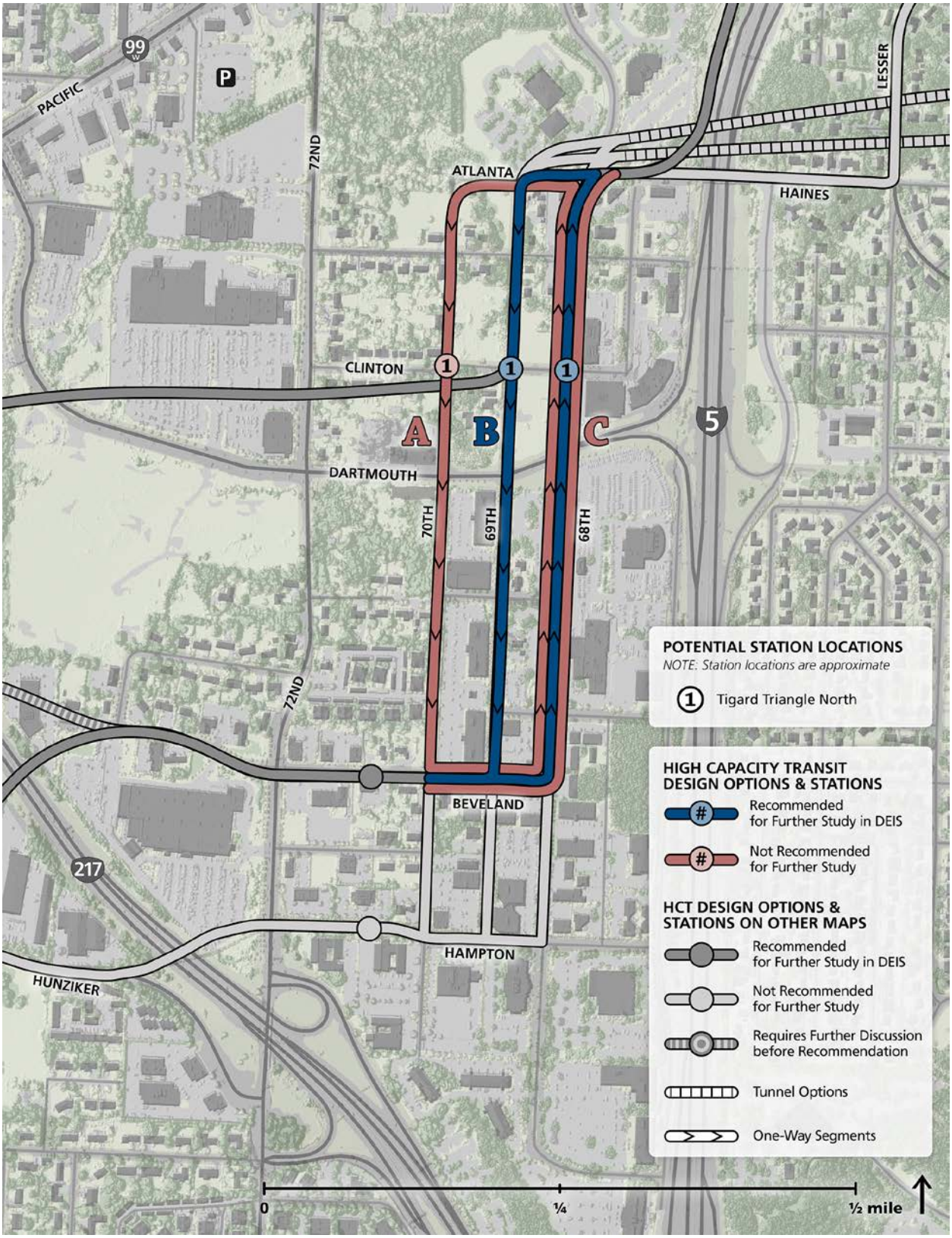
Opportunities – the options would:

- Serve PCC-Sylvania campus directly;
- Support potential redevelopment of PCC-Sylvania campus;

Constraints – the option would:

- Be very expensive compared to surface options and more expensive than the short tunnel options without providing significantly more benefit;
- Likely be contingent on changes to the PCC Sylvania Campus Master Plan to accommodate future redevelopment of the campus area.

4. Tigard Triangle – BRT and LRT



4. Tigard Triangle – BRT and LRT

The options in this section are differentiated mainly by their locations and footprints within the Tigard Triangle, including couplet options and choices of using SW 68th, SW 69th, and SW 70th Avenues to connect the northern and southern areas of the Triangle. Of the three options under consideration, one is recommended for further study. The three Tigard Triangle options do not apply to the Clinton to Tigard Transit Center option in the following section (OR-217 Crossing), which would operate on only a short segment of SW 69th Avenue in the northern section of the Triangle.

Recommended for Further Study

B. 68th/69th Couplet (BRT & LRT)

HCT would split into a couplet running through the Tigard Triangle, with the southbound line running along SW 69th Avenue and the northbound line running along SW 68th Avenue.

Opportunities—the option would:

- Result in more efficient transit and auto travel compared to the two-way option;
- Require less right-of-way, resulting in fewer property impacts compared to other options;
- Best support Tigard's High Capacity Transit Land Use Plan.

Constraints—the option would:

- Potentially result in higher capital costs compared to the two-way street option because of additional street improvements, bollards, catenaries and equipment, etc.

Not Recommended

C. 68th Two-Way (BRT & LRT)

HCT would run in both directions along SW 68th Avenue.

Opportunities—the option would:

- Potentially result in lower capital costs compared to couplet options.

Constraints—the option would:

- Have greater right-of-way impacts compared to couplet options due to width of right of way required to accommodate two lanes of transit and two lanes of vehicles with turn lanes.

A. 68th/70th Couplet (BRT & LRT)

HCT would split into a couplet running through the Tigard Triangle, with the southbound line running along SW 70th Avenue and the northbound line running along SW 68th Avenue.

Opportunities—the option would:

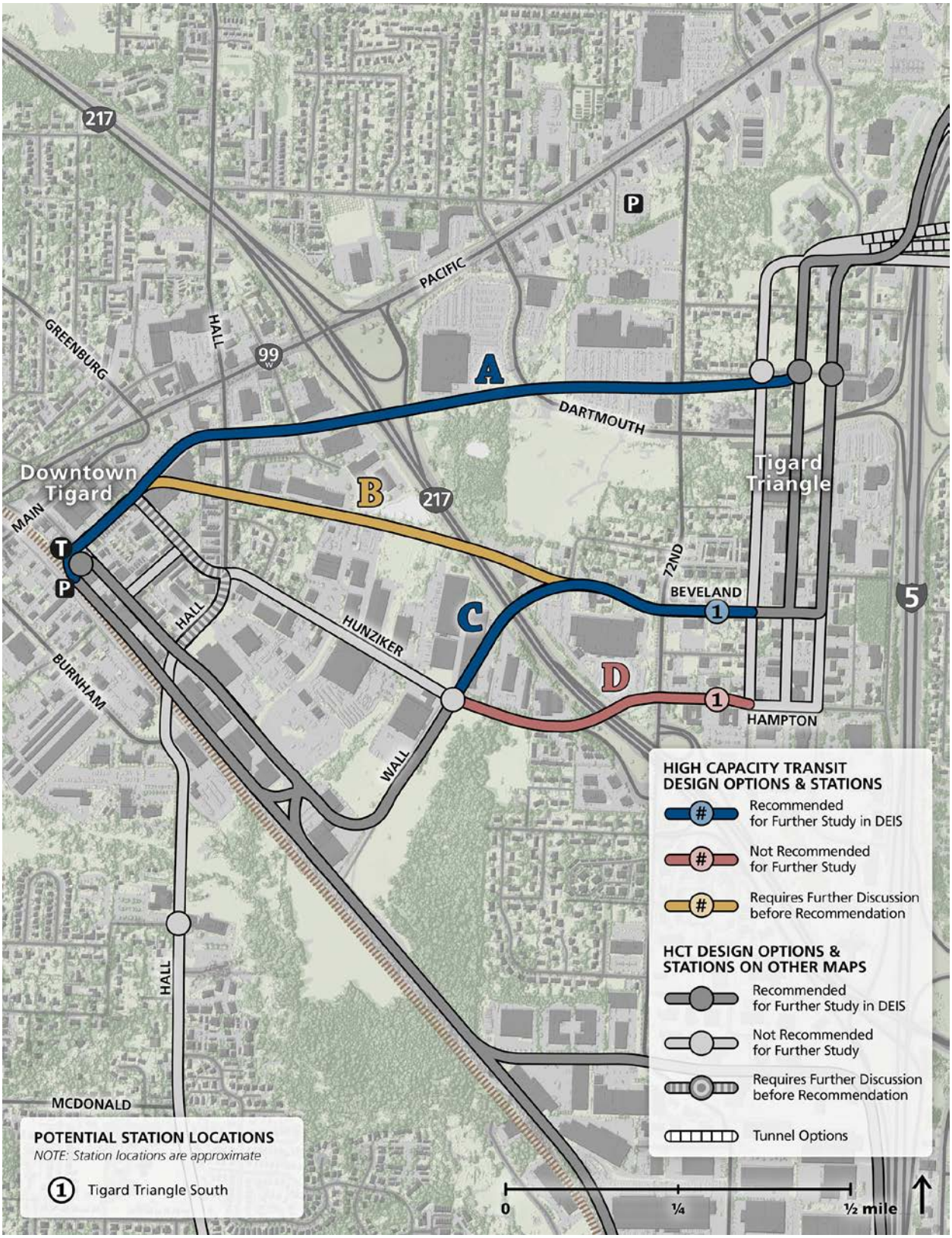
- Require little right-of-way along SW 68th Avenue;
- Increase distance from I-5 ramps for the southbound line of the couplet, resulting in fewer traffic impacts compared to SW 68th/69th Avenue couplet option;

- Increase connectivity in the Tigard Triangle with additional north/south street.

Constraints—the option would:

- Require significantly more structure and property acquisition compared to the SW 68th/69th Avenue couplet requiring considerable ROW acquisition along SW 70th Avenue. The SW 70th Avenue ROW is generally only 30' in width and is mostly unimproved;
- Potentially result in higher capital costs compared to the two-way street option because of additional street improvements, bollards, catenaries and equipment, etc;
- Not have land uses supportive of a fronting couplet street, given the residential character of SW 70th Avenue to the west and parking lots behind businesses on SW 69th Avenue to the east. Additionally, steep cross slopes make access to fronting lots difficult.

5. OR-217 Crossing – BRT and LRT



5. OR-217 Crossing – BRT and LRT

The proposed connections between the Tigard Triangle and downtown Tigard provide a choice between speed (travel time) and development opportunities. Of the four options, two are recommended for further study, one requires further discussion before recommendation, and one is not recommended. Clinton to Tigard Transit Center would be significantly faster than the other options and would result in a smaller footprint in downtown Tigard, but would serve only the northern portion of the Tigard Triangle and require a comparatively long structure. Other options would continue through the southern Triangle, an area with commuter students and redevelopment opportunities. Each crossing option could include a multimodal (auto/ped/bike) bridge at a higher cost; a new auto connection would be preferred in the southern portion of the Triangle to the northern portion. Wetlands impacts could be a concern for the Clinton to Tigard Transit Center and for the Beveland North options.

Recommended for Further Study

A. Clinton to Tigard Transit Center (BRT & LRT)

HCT would extend from SW Clinton Street, travelling south of Costco, across OR-217 on a new bridge (4000' long), crossing SW Hall Boulevard and SW Scoffins Street to reach the Tigard Transit Center.

Opportunities—the option would:

- Prioritize travel time, with a shorter alignment and higher speeds compared to other options;
- Avoid potentially congested intersections at the southern end of the Triangle;
- Avoid impacts to existing industrial properties that would be affected by other options.

Constraints—the option would:

- Potentially impact natural area/wetlands;
- Impact commercial parking lots in Triangle and in downtown Tigard;
- Provide less HCT access to southern portion of Tigard Triangle compared to other options.

C. Beveland South (BRT & LRT)

HCT would cross OR-217 on a new bridge (1100' long) extending from SW Beveland Street and curving south, merging with SW Wall Street near SW Hunziker Street. From here, it would continue either on SW Commercial Street, or or on SW Hunziker Street to the Tigard Transit Center.

Opportunities—the option would:

- Prioritize development with a second station in the Tigard Triangle, supporting the Tigard High Capacity Transit Land Use Plan and providing greater accessibility throughout the Triangle;
- Include a potential station, park & ride lot, and redevelopment opportunities near SW Hunziker Street;
- Include a multimodal facility that would provide an alternative to the existing crossings of OR-217 at SW 72nd Avenue or at OR-99W and could alleviate some auto congestion around these

interchanges by providing a route for local traffic to connect between the Triangle and Downtown Tigard.

Constraints—the option would:

- Impact industrial properties near SW Hunziker Street.

Further Discussion Required

B. Beveland North (BRT & LRT)

HCT would cross OR-217 on a 2200' long new bridge extending from SW Beveland Street and continuing west, crossing SW Hall Boulevard and curving southward to align with a new transit street between SW Main and SW Ash Streets identified in the Tigard TSP.

Opportunities—the option would:

- Provide a second station in the Tigard Triangle;
- Provide a more direct connection to the Tigard Transit Center compared to the Beveland South option;
- Avoid a congested area at the OR-217 interchange with SW 72nd Avenue and SW Hunziker Road;
- Provide opportunity for new auto/ped/bike connection between downtown Tigard and the Tigard Triangle.

Constraints—the option would:

- Potentially impact natural area/wetlands;
- Impact buildings and properties near 217 and in downtown Tigard;
- Miss opportunity to provide additional access to adjacent properties and leverage redevelopment opportunities due to grade separation of the alignment.

Not Recommended

D. Hampton (BRT & LRT)

HCT would cross OR-217 on a new bridge extending west from SW Hampton Street to connect with SW Hunziker Road.

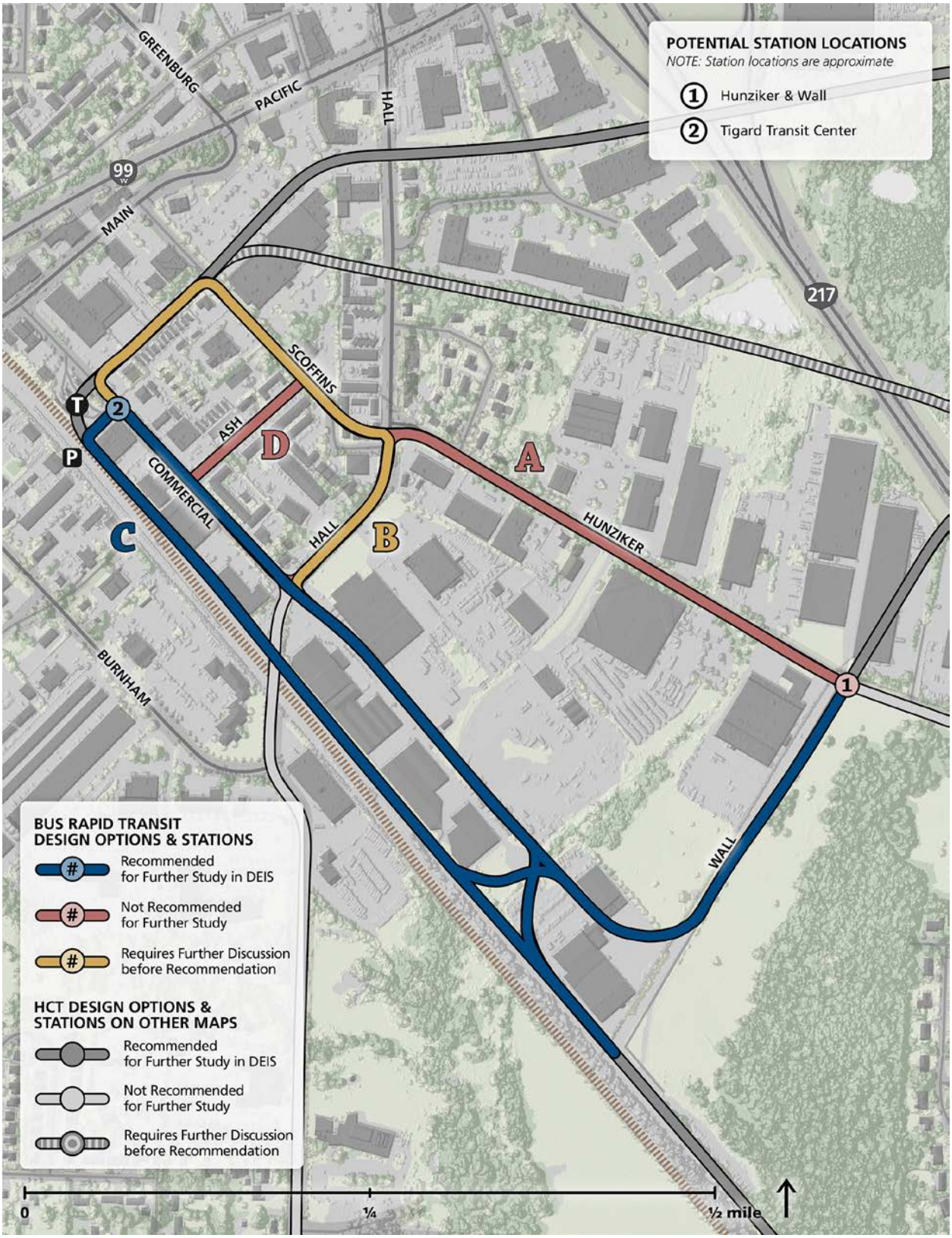
Opportunities—the option would:

- Include a station further south in the Triangle.

Constraints—the option would:

- Impact traffic at the OR-217 interchanges at SW Hunziker road and SW 72nd Avenue or;
- Require removal of several buildings to grade separate over SW 72nd Avenue to avoid impacts to the OR-217 interchange on a very long fly over structure;
- Be the least direct, slowest option without providing access to additional riders.

6. Downtown Tigard – BRT



6. Downtown Tigard – BRT

The following options in downtown Tigard correspond with the Beveland South or Hampton OR-217 Crossing options. The northern crossing options, Beveland North and Clinton to Tigard Transit Center, would connect to the WES alignment crossing SW Hall Boulevard via a new street between Main Street and Ash Avenue. The main difference between the downtown Tigard options connecting to the southern crossings is the footprint required to access the Tigard Transit Center in downtown Tigard.

Recommended for Further Study

C. Commercial Street to Tigard TC (tight loop)

Continuing from the Beveland Bridge along the general alignment of Wall Street to an extension of Commercial Street, LRT would come into downtown Tigard northbound along SW Commercial Street and loop into the Tigard Transit Center with a station by the existing WES station. Leaving the station area, HCT would continue to the south along the heavy rail ROW.

Opportunities—the option would:

- Have the smallest footprint of the through options on downtown streets in Tigard;
- Improve (auto/pedestrian/bike/freight) connectivity in Downtown Tigard and to the Triangle;
- Provide opportunities for access to large industrial properties currently accessed only by SW Hunziker Street.

Constraints—the option would:

- Impact several existing industrial and commercial buildings and properties;
- Potentially impact the existing Tigard Transit Center;

Further Discussion Required

B. Commercial Street with downtown loop via Hall

This option works with a connection from the Tigard Triangle via Beveland South and other more southern crossing options. From the SW Hunziker/SW Wall intersection, continuing south on SW Wall Street before angling toward SW Commercial Street, HCT would make a counter-clockwise loop with a single transit lane heading northeast on SW Hall Boulevard, northwest onto SW Scoffins Street, southwest onto a new street at the Tigard Transit Center, and finally southeast back onto SW Commercial Street.

Opportunities—the option would:

- Avoid the sharp curve included with the non-loop Commercial option that could be challenging for LRT and could create noise impacts;
- Avoid impacts to the existing Tigard Transit Center.

Constraints—the option would:

- Impact several existing industrial and commercial buildings and properties;

- Require one lane of right-of-way on SW Hall Boulevard, SW Scoffins Street, and SW Commercial Street in downtown Tigard resulting in widening and some property impacts;
- Result in a longer, slower alignment.

Not Recommended

D. Downtown loop via Ash Street instead of loop via Hall

This option would be similar to the Commercial or Hunziker Street loop options with a downtown loop via Hall Boulevard except that the northbound segment of the downtown loop would be on Ash Street instead of Hall Boulevard.

Opportunities—the option would:

- Avoid potential impacts of HCT running on Hall Boulevard between Hunziker and Commercial.

Constraints—the option would:

- Result in more property impacts to downtown Tigard compared to the alternative loop.

A. Hunziker

From the Tigard Triangle, after approaching downtown Tigard via SW Hunziker Road, BRT would make a counter-clockwise loop starting on SW Scoffins Street, then turning southwest onto a new street at the Tigard Transit Center, southeast onto SW Commercial Street. From Tualatin, BRT would use SW Hall Boulevard or SW Ash Street to make the same counter-clockwise loop, and then use SW Hall or SW Ash again to reach SW Hunziker to travel toward the Tigard Triangle.

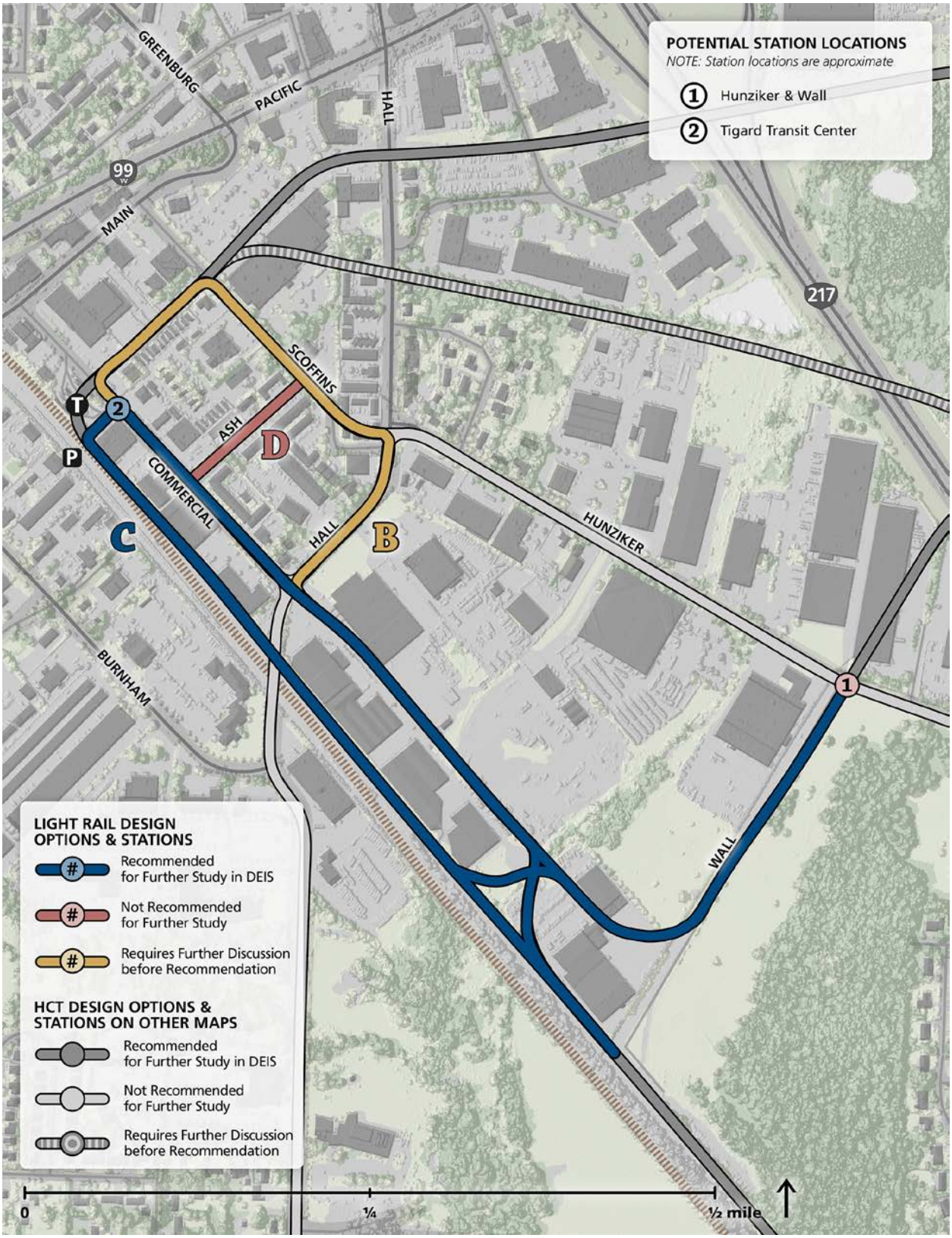
Opportunities—the option would:

- Result in lower capital costs compared to the other through options, which all include construction of a new street continuing from SW Commercial Street toward SW Wall Street.

Constraints—the option would:

- Require BRT operation in mixed traffic in order to avoid eliminating access to industrial business by left-turning trucks resulting in slower, less reliable service on SW Hunziker Street.

6. Downtown Tigard – LRT



6. Downtown Tigard – LRT

The following options in downtown Tigard correspond with the Beveland South or Hampton OR-217 Crossing options. The northern crossing options, Beveland North and Clinton to Tigard Transit Center, would connect to the WES alignment crossing SW Hall Boulevard via a new street between SW Main Street and SW Ash Avenue. The main difference between the downtown Tigard options connecting to the southern crossings is the footprint required to access the Tigard Transit Center in downtown Tigard. Of the three options, one is recommended for further study and one requires further discussion.

Recommended for Further Study

C. Commercial Street to Tigard TC (tight loop)

Continuing from the Beveland Bridge along the general alignment of SW Wall Street to an extension of SW Commercial Street, LRT would come into downtown Tigard NB along SW Commercial and loop into the Tigard Transit Center with a station by the existing WES station. Leaving the station area, HCT would continue to the south along the heavy rail ROW.

Opportunities—the option would:

- Have the smallest footprint of the through options on downtown streets in Tigard.
- Improve (auto/pedestrian/bike/freight) connectivity in Downtown Tigard and to the Triangle
- Provide opportunities for access to large industrial properties currently accessed only by SW Hunziker Street.

Constraints—the option would:

- Impact several existing industrial and commercial buildings and properties;
- Impact the existing Tigard Transit Center;
- Require a tight turning radius near the transit center, which could potentially have noise impacts.

Further Discussion Required

B. Commercial Street with downtown loop via Hall

This option works with a connection from the Tigard Triangle via Beveland South and other more southern crossing options. From the SW Hunziker/SW Wall intersection, continuing south on SW Wall before angling toward SW Commercial Street, HCT would make a counter-clockwise loop with a single transit lane heading northeast on SW Hall Boulevard, northwest onto SW Scoffins Street, southwest onto a new street at the Tigard Transit Center, and finally southeast back onto SW Commercial Street.

Opportunities—the option would:

- Avoid the sharp curve included with the non-loop Commercial option that could be challenging for LRT and could create noise impacts;
- Avoid impacts to the existing Tigard Transit Center.

Constraints—the option would:

- Impact several existing industrial and commercial buildings and properties;
- Require one lane of right-of-way on SW Hall Boulevard, SW Scoffins Street, and SW Commercial Street in downtown Tigard resulting in widening and some property impacts;
- Result in a longer, slower alignment.

Not Recommended

D. Downtown loop via Ash Street instead of loop via Hall

This option would be similar to the Commercial Street loop option with a downtown loop via SW Hall Boulevard except that the northbound segment of the downtown loop would be on SW Ash Street instead of SW Hall Boulevard.

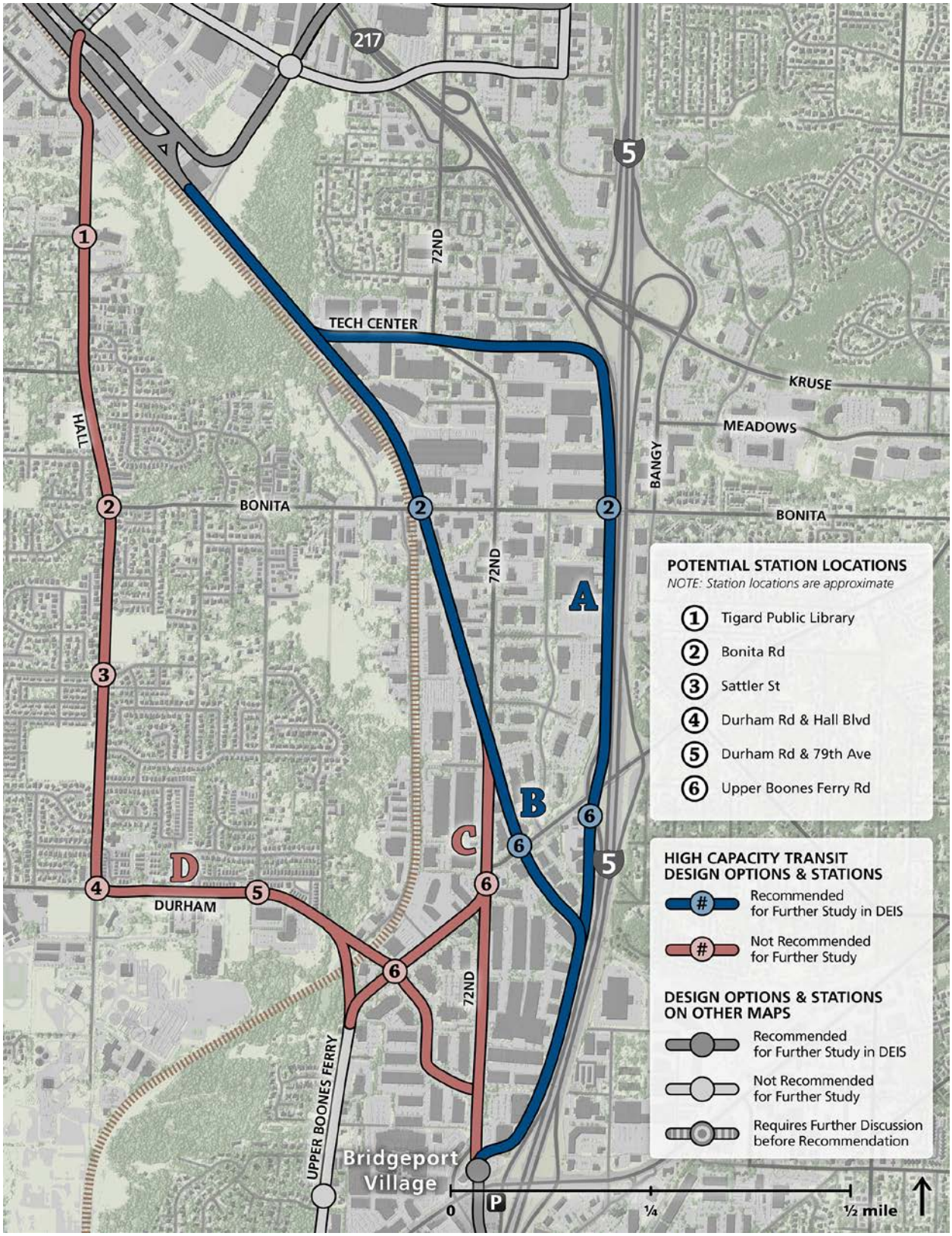
Opportunities—the option would:

- Avoid potential impacts of HCT running on SW Hall Boulevard between SW Hunziker Street and SW Commercial Street.

Constraints—the option would:

- Result in more property impacts to downtown Tigard compared to the alternative loop.

7. Tigard South – BRT and LRT



7. Tigard South – BRT and LRT

Three of the options in this segment would operate parallel to a portion of the WES alignment between Tigard and Tualatin before reaching Bridgeport Village by differing routes. For these options, if looping around the downtown streets and returning to the SW Commercial Street extension HCT would head out of town to the south again along SW Commercial Street and then cross between two industrial buildings to run southeast alongside the existing heavy rail and WES alignment. Options using SW Commercial Street with a single lane of transit would travel northwest and turn through the transit center (tight loop) coming parallel with the WES alignment to head southeast out of town. The Clinton to Tigard Transit Center and Beveland North OR-217 Crossing options would allow HCT to run directly from the new street between SW Main and SW Ash through the existing transit center to parallel the WES alignment. These WES alignment options would serve more employment compared to the remaining option, which would connect to Bridgeport Village via SW Hall Boulevard and SW Durham Road and serve mainly single-family households. The three WES alignment options are differentiated by right-of-way ownership and by varying impacts to industrial businesses.

Recommended for Further Study

B. WES alignment to parallel I-5 via PNWR freight rail ROW (BRT & LRT)

HCT would utilize the WES right-of-way to approximately Tech Center Drive, then use freight rail right-of-way until reaching the I-5 right-of-way (south of the SW Upper Boones Ferry Road/Carman Drive, I-5 interchange), where the alignment would cross over the heavy rail tracks on a structure to come parallel with the west side of I-5. Continuing south, the alignment would include an elevated station at RBridgeport Village over SW Bridgeport road, until traveling onto Lower Boones Ferry Road (south of Bridgeport Road).

Opportunities—the option would:

- Avoid impacts to the residential area directly south of downtown Tigard;
- Provide the most direct and efficient route to the Bridgeport area;
- Avoid impacts to industrial business accesses on SW 72nd Avenue;
- Avoid potentially congested intersections along SW 72nd Avenue;
- Require fewer property acquisitions compared to WES option utilizing Tech Center Drive, resulting in lower costs.

Constraints—the option would:

- Provide less access to SW 72nd Avenue employment area;
- Not provide development opportunities adjacent to I-5.

A. WES alignment to parallel I-5 via Tech Center Drive (BRT & LRT)

HCT would utilize the WES right-of-way to SW Tech Center Drive, where it would turn east and continue parallel to Tech Center Drive, cross SW 72nd Avenue, traveling between properties, and finally turn south

to travel adjacent to I-5. HCT running adjacent to I-5 would likely provide stations near SW Bonita Road and SW Carman Drive, before reaching a station at Bridgeport Village and merging onto Lower Boones Ferry Road (south of Bridgeport Road).

Opportunities—the option would:

- Avoid impacts to residential area directly south of downtown Tigard;
- Avoid impacts to industrial business accesses on SW 72nd Avenue;
- Avoid congested intersections along SW 72nd Avenue;
- Avoid freight rail right of way, south of Tech Center Drive, the use of which could require involved negotiations with rail owners;
- Provide connectivity to areas east of I-5 at the SW Bonita Road and SW Carman Drive/SW Upper Boones Ferry Road crossings.

Constraints—the option would:

- Provide less access to SW 72nd Avenue employment area;
- Provide limited development opportunity adjacent to I-5;
- Require less direct travel to Bridgeport Village;
- Impact several buildings and properties close to I-5.

Not Recommended

C. WES alignment and SW 72nd (BRT & LRT)

HCT would utilize the WES right-of-way to SW 72nd Avenue, where it would diverge from the rail line to join with 72nd heading south toward Bridgeport Village.

Opportunities—the option would:

- Avoid impacts to residential area directly south of downtown Tigard;
- Provide the most direct route to Bridgeport Village and potentially the fastest travel times among the South Tigard options.

Constraints—the option would:

- Impact industrial business accesses on SW 72nd Avenue;
- Potentially impact traffic on SW 72nd Avenue;
- Potentially be slowed by congestion at intersections along SW 72nd Avenue.

D. Hall to Durham (BRT & LRT)

HCT would travel south out of downtown Tigard along Hall Boulevard, and then head southeast onto Durham Road toward Bridgeport Village.

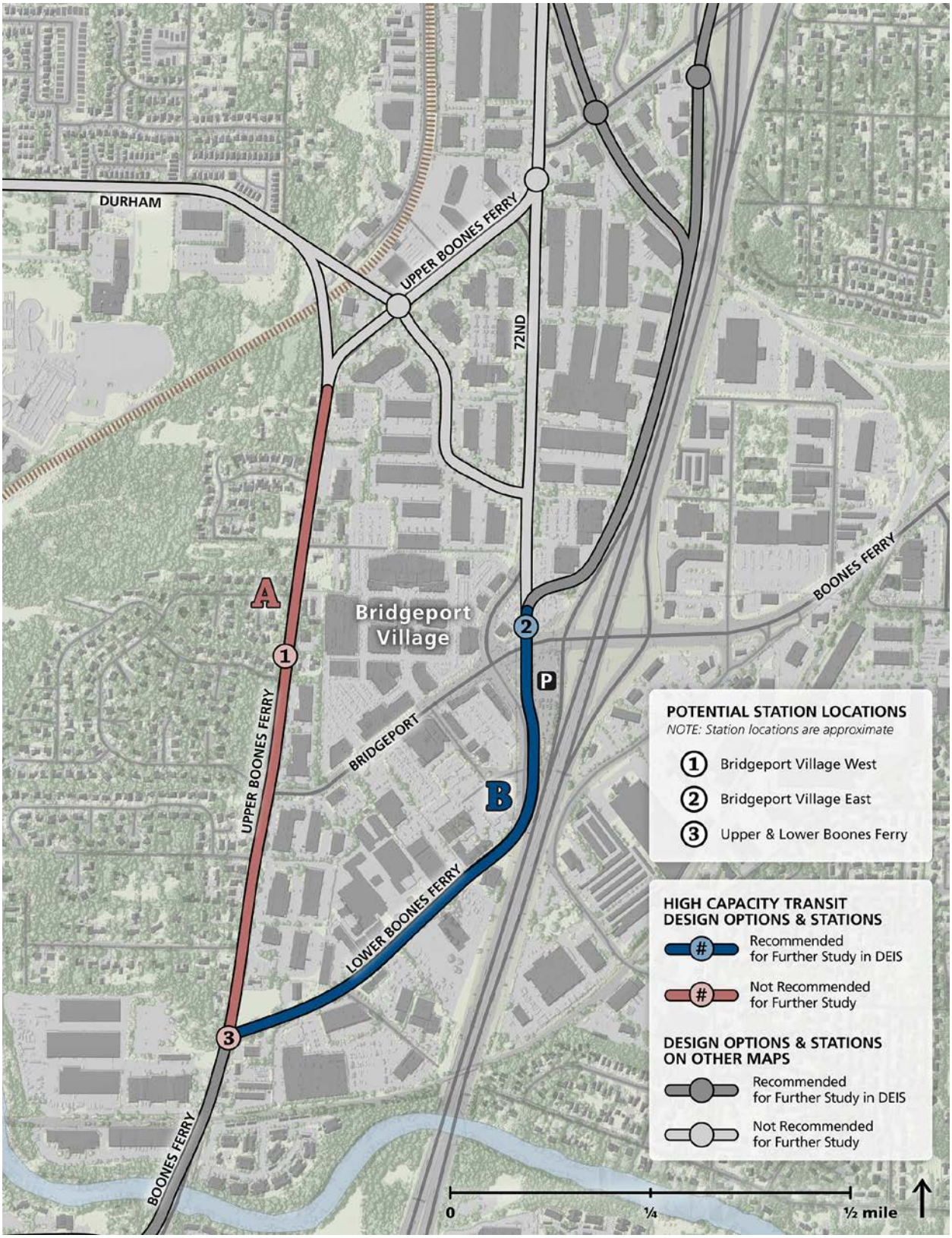
Opportunities—the option would:

- Serve Tigard library and municipal offices;
- Provide street improvements including bicycle and pedestrian facilities currently lacking in segments of SW Hall Boulevard and SW Durham Road.

Constraints—the option would:

- Travel through predominantly single-family residential areas with limited ridership and development potential;
- Result in slower travel times compared to WES/heavy rail alignment options;
- Require grade-separated crossings for LRT across heavy rail tracks south of downtown Tigard and near Durham Road and SW 74th Avenue, either with a long bridge or a tunnel;
- Not provide access to employment areas just west of I-5 in Tigard.

8. Bridgeport Village – BRT and LRT



8. Bridgeport Village – BRT and LRT

There are two options under consideration for this segment, of which one is recommended for further study. Lower Boones Ferry Road provides access to the "front" of the Bridgeport Village shopping area whereas Lower Boones Ferry Road runs along the "back" of Bridgeport Village.

Recommended for Further Study

B. Lower Boones Ferry Road (BRT & LRT)

Coming from any of the South Tigard design options, HCT would run east of Bridgeport Village along SW 72nd Avenue and Lower Boones Ferry Road to provide direct access to the "front" of the shopping area. The design option would include an elevated station at the Tualatin Park & Ride lot and a pedestrian crossing over SW 72nd Avenue to the shopping area.

Opportunities—the option would:

- Serve the main entrance of Bridgeport Village;
- Provide direct access to Tualatin Park & Ride lot;
- Include a pedestrian bridge crossing over SW Lower Boones Ferry/SW Bridgeport Road intersection;
- Be accessible to new housing developments south of Bridgeport Village.

Constraints—the option would:

- Impact some parking and landscaping along SW Lower Boones Ferry Road;
- Require structure to avoid impacts to traffic at the I-5 interchange with Lower Boones Ferry Road.

Not Recommended

A. Upper Boones Ferry Road (BRT & LRT)

Coming from either the SW Hall Boulevard or the WES Alignment to SW 72nd Avenue, South Tigard design options, HCT would run west of Bridgeport Village along Upper Boones Ferry Road to provide access to the "back" of the shopping area.

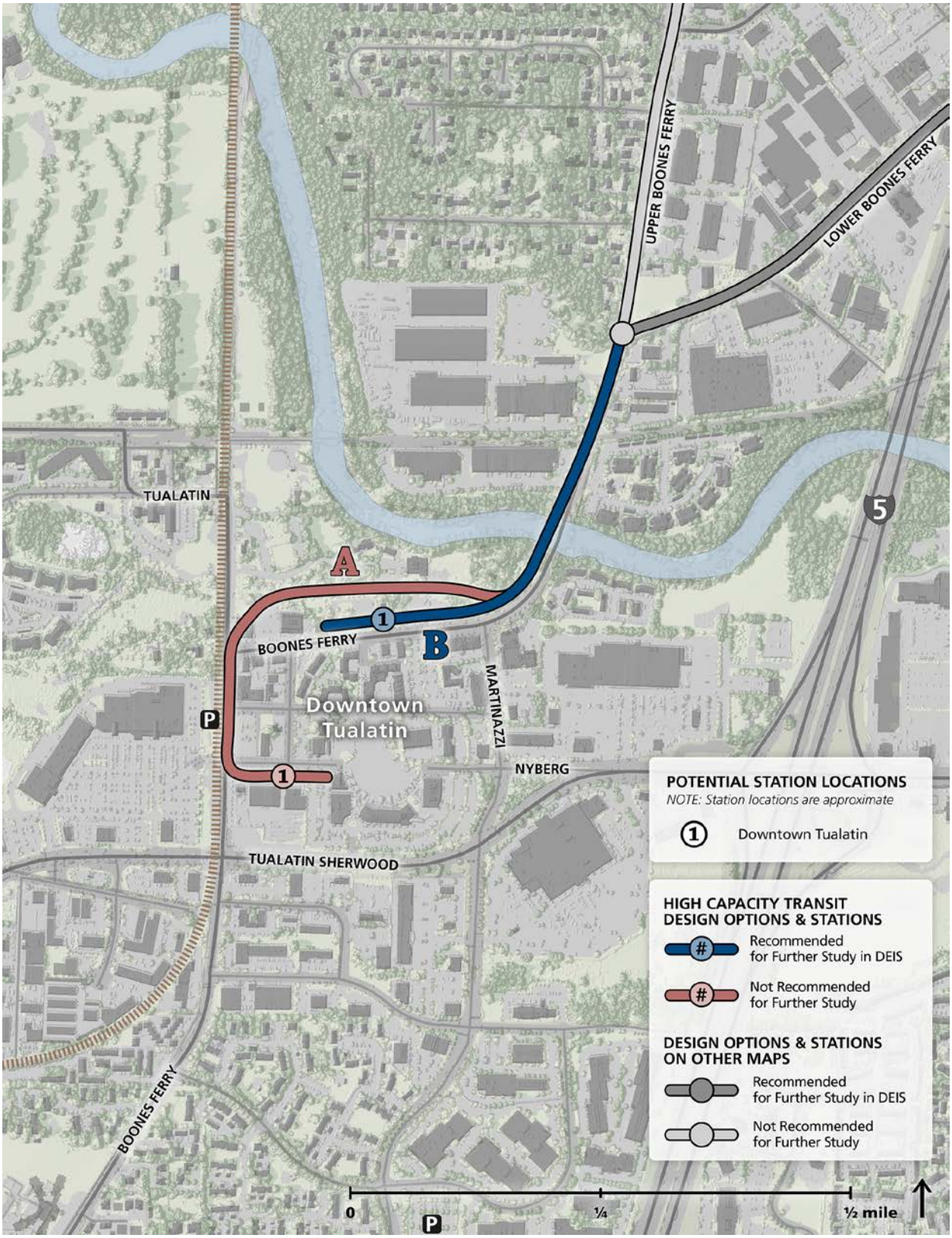
Opportunities—the option would:

- Avoid congested area at the I-5 interchange with Lower Boones Ferry Road, for both reduced traffic impacts and faster transit performance.

Constraints—the option would:

- Not serve the main entrance of Bridgeport Village;
- Require a long and indirect walk to utilize the Tualatin Park & Ride lot;
- Remove recent streetscaping installed by the City of Durham;
- Impact tree groves purchased by Durham residents through a bond measure or remove large proportions of parking at commercial buildings opposite the forested area;
- Be incompatible with the recommended parallel to I-5 options to the north.

9. Tualatin – BRT and LRT



9. Tualatin – BRT and LRT

There are two options under consideration in this segment, one of which is recommended for further study. Both options would include a new crossing parallel to the Boones Ferry Road Bridge over the freight rail tracks and the Tualatin River, and both would be aligned parallel to and north of Boones Ferry Road in downtown Tualatin (outside of the road right of way). The option that is not recommended would continue south into downtown to better connect with the WES station; however, a station directly adjacent to the WES platform would not be possible without widening Boones Ferry Road and impacting buildings/properties or moving the WES alignment.

Recommended for Further Study

B. Parallel to Boones Ferry Road (north of downtown) (BRT & LRT)

Continuing from any Bridgeport Village alignment, HCT would enter downtown on a new bridge crossing over the heavy rail line and the Tualatin River parallel to Boones Ferry Road. After crossing the river, HCT would turn west to a station parallel to and north of Boones Ferry Road.

Opportunities—the option would:

- Provide walk access to downtown Tualatin and to the WES station;
- Result in fewer property impacts and traffic impacts compared to the alternative option.

Constraints—the option would:

- Potentially impact access to properties north of Boones Ferry on northern edge of downtown Tualatin.

Not Recommended

A. WES connection via Boones Ferry Road near Nyberg Road (BRT & LRT)

Continuing from any Bridgeport Village alignment, HCT would enter downtown Tualatin on a new bridge crossing over the heavy rail line and the Tualatin River parallel to Boones Ferry Road. After crossing the river, HCT would travel west along Boones Ferry Road (behind existing businesses) and would turn south on SW Tualatin Road with a station near the intersection of Nyberg and Tualatin Road.

Opportunities—the option would:

- Provide the closest connection to WES station.

Constraints—the option would:

- Result in impacts buildings and commercial properties in downtown;
- Likely require elimination of left turn pockets or other lanes on SW Boones Ferry Road at SW Nyberg Road due to inadequate available width.