CITY OF BELLEVUE
TRANSPORTATION DEPARTMENT

MOUNTAINS TO SOUND GREENWAY
TRAIL STUDY

DECEMBER 2012

ACKNOWLEDGEMENTS

CITY OF BELLEVUE

CHRIS MASEK, PE
FRANZ LOEWENHERZ
TRESA BERG
GEOFFREY BRADLEY
DAN DEWALD
KURT LATT, PE
RAID TIRHI, PE
PAUL INGHRAM
JEN BENN
MIKE MATTAR, PE

MOUNTAINS TO SOUND GREENWAY TRUST

CYNTHIA WELTI
AMY BROCKHAUS

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

BILL JAMES, PE
KURT STILES
RON JONES

KING COUNTY

ROBERT FOXWORTHY, AICP
DALE CUMMINGS
LG HAHN

JS URBAN & GRAPHIC DESIGN

JESSICA HARTMANN

GLACIER AVIATION

TABLE OF CONTENTS

01
INTRODUCTION

INTRODUCTION

The Mountains to Sound Greenway Trail is approximately a 100 mile regional trail system that connects the Seattle waterfront with Central Washington (see Figure 1). This important trail system is used by both pedestrians and cyclists for recreational and commuting purposes. Within the City of Bellevue, there are significant gaps and barriers to use of the Mountains to Sound Greenway trail. The trail ends abruptly at Factoria Boulevard and the next trail access is located about two miles east at the Sunset Trail (located east of SE 35th Pl and SE Eastgate Way).

In 2011, the Mountains to Sound Greenway Trust obtained a $158,312 Federal Highway Administration Scenic Byways grant to undertake design feasibility analysis of the future trail alignment. The City of Bellevue provided $40,000 in matching funds to obtain the grant. The Greenway Trust and City worked together with other stakeholders to prepare this trail study. The Trail Design study will be based off of the preferred alignments identified in the **Eastgate/I-90 Land Use and Transportation Study** which calls for a trail on the south side of I-90 between Factoria Blvd SE and Lakemont Blvd SE (see Figure 2 on page 5).

PROJECT VISION

The purpose of this trail design study is to develop details and guidance to fill the 3.6 mile "Bellevue Gap" in the Mountains to Sound Greenway Regional Trail System. The proposed alignment presented provides a framework and guidance for design and construction when funding becomes available in the future.

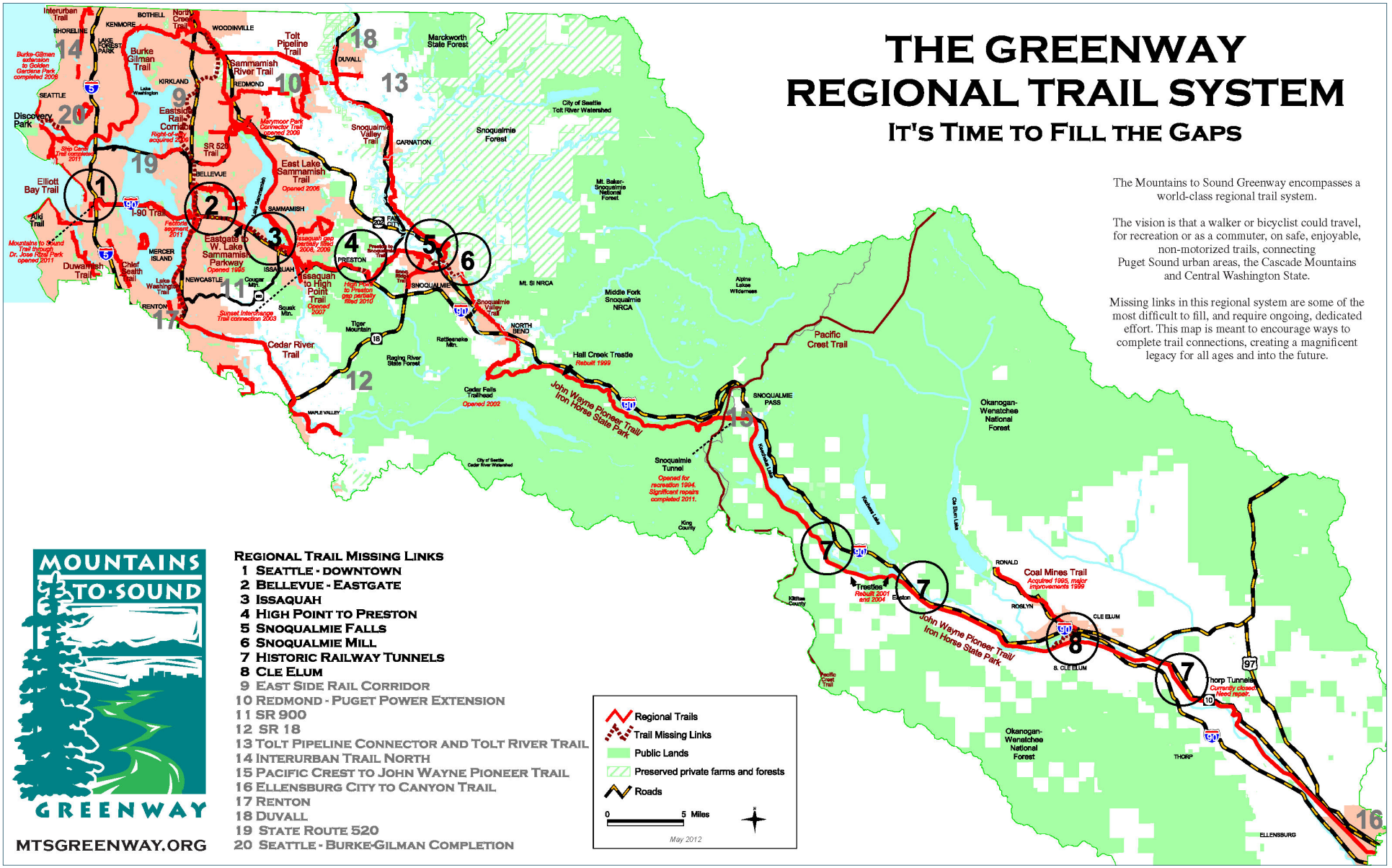


FIGURE 1 Missing links in the regional Mountains to Sound Greenway Trail System are some of the most difficult to fill, and require ongoing, dedicated effort.

The design study is based on stakeholder involvement and feedback, identifying right of way needs and permit requirements, and the identification of broad environmental impacts. The report also includes a planning level cost estimate for the proposed trail based on the final alignment, recommended design standards, and a financing plan.

STUDY PROJECT TEAM AND STAKEHOLDERS

Two study project teams were formed which consisted of City Bellevue staff, Mountains to Sound Greenway Trust staff, Washington State Department of Transportation (WSDOT) Northwest Region staff, and staff from King County. The broader Review team was responsible for reviewing plans and documents and providing feedback. The Technical team was a subset of the Review team, which worked through the technical and operational details of the conceptual design.

Project stakeholders include the following:

Ag*encies/Institutions:* WSDOT, Mountains to Sound Greenway Trust, King County Metro, and Bellevue College

Businesses/Companies: Factoria Village, Bellevue Honda, T-Mobile, Newport Corporate Center, Sterling Realty, M&H Investments, Panos Enterprises, Paccorp Center, Group Health, Sun Life Assurance, Trailer, Inns, Inc., 14-205 Building, and Eastgate Plaza.

Bellevue Citizens/Property Owners: Adjacent property owners, residents within ½ mile of the project limits, and other community associations.

Other Potentially Affected Interests: Bicyclists, Cascade Bicycle Club, Pedestrians, and recreational users.

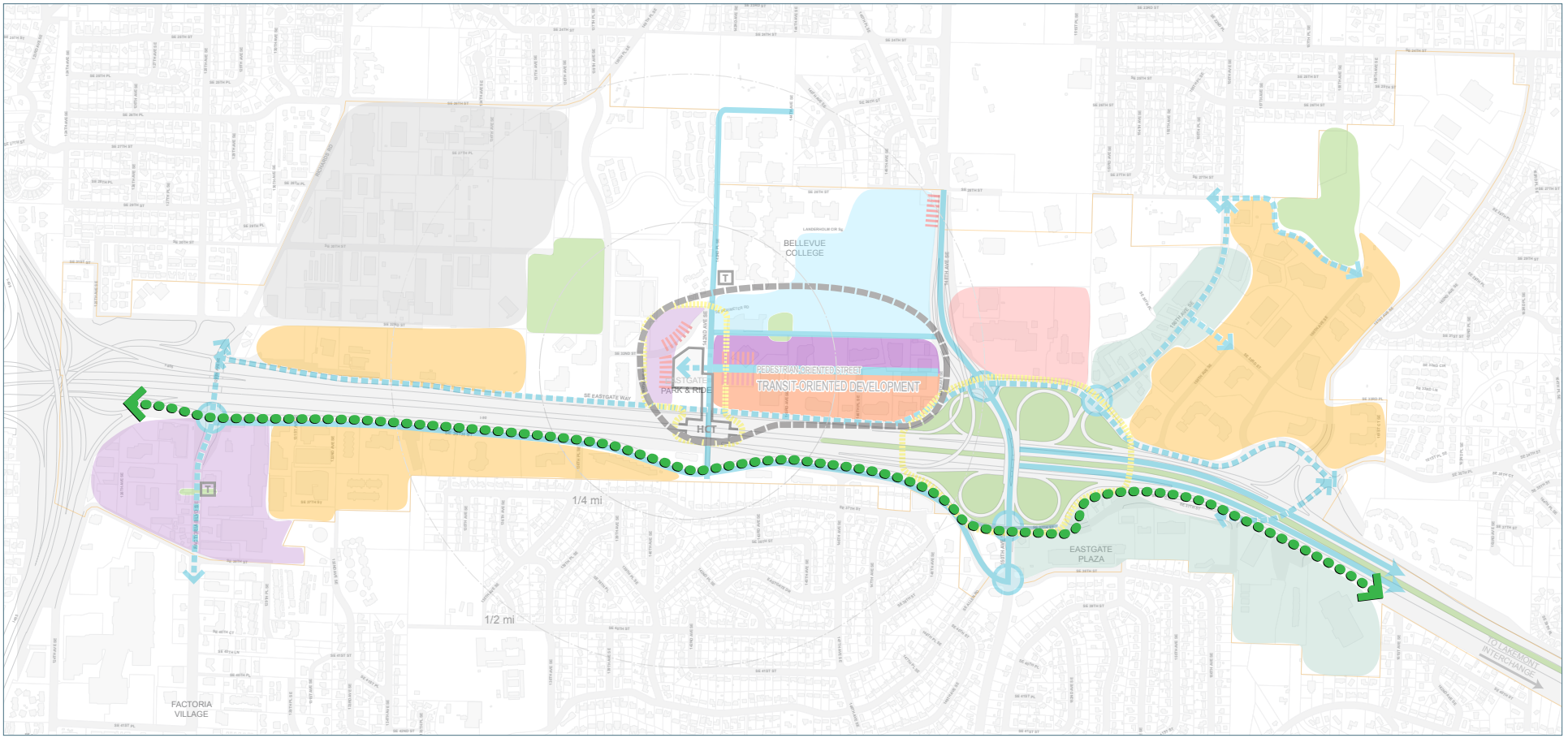


FIGURE 2 Preferred ailgnment of the Mountains to Sound Greenway Trail as identified in the Eastgate/I-90 Land Use & Transportation Study. The trail alignment is shown in the foreground as a dotted green arrow.

02
PREVIOUSLY COMPLETED WORK

PREVIOUSLY COMPLETED WORK

OF FOUR ALTERNATIVES PRESENTED IN AN ON-LINE QUESTIONNAIRE, **64% OF RESPONDENTS PREFERRED THE ALIGNMENT ALONG THE SOUTH SIDE OF I-90 TO SE NEWPORT WAY** BECAUSE IT IS THE MOST DIRECT AND CONTINUOUS ROUTE. RESPONDENTS PREFERRED THIS ALTERNATIVE AT A RATIO OF APPROXIMATELY TWO TO ONE OVER THE SECOND PREFERRED ALIGNMENT (NORTH OF I-90, ALONG EASTGATE WAY).

Bellevue Transportation Strategies Report

The Eastgate commercial area along I-90 is one of five major employment centers in Bellevue, representing approximately 18% of the city's total work force. It is also an important hub for higher education, a crucial transportation corridor, and a center for neighborhood services for nearby residential areas. To ensure that the area remains vital, on February 1, 2010, the Bellevue City Council directed staff to conduct a land use and transportation study for the Eastgate/I-90 area. The study was completed in January 2012.

Many ideas were considered as part of the **Eastgate/I-90 Land Use and Transportation Project** on how to address the gaps in the Mountains to Sound Greenway Trail within the City of Bellevue. Community input represented an important consideration in the assessment of trail alignment options.

On July 26, 2011, Bellevue staff held an outreach ride for residents to experience first-hand what it is like to ride a bike along the missing link in the Mountains to Sound Greenway Trail. An online questionnaire was sent to cyclists who joined the ride to obtain reactions to their experience with the present state of the corridor and input on future development of the trail. Input from this process is summarized in the **Outreach Bike Ride Summary Report**.

Responses during the ride and in the on-line questionnaire indicated that riders prefer the southern alignment because it is the most direct and continuous route. Input from this process prompted the project's Citizen Advisory Committee to endorse the trail alignment on the Southside of I-90 (see Figure 2 on page 5). This study builds on the work previously completed and further investigates details of the alignment.

03

PUBLIC INVOLVEMENT & COMMUNITY OUTREACH

PUBLIC INVOLVEMENT & COMMUNITY OUTREACH

FIGURE 3 Project sign on SE 36th St.

Public involvement is a key component to validating the conceptual design and garnishing community support to build the Bellevue gap of the Mountains to Sound Greenway trail when funding becomes available in the future.

PROJECT SIGNS

Project signs were installed in February 2012 to inform the public that the study was in progress (see Figure 3). They were removed after the study was completed in December 2012.

PROJECT WEBSITE

A project study **website** was setup to provide the public with information about the project, background materials, and the opportunity to sign up for an E-Alert to get updates when the website changed. Material presented at the open houses was uploaded to the site after the open houses.

NEWSLETTER AND OPEN HOUSE COMMUNICATIONS

A newsletter about the project and the open houses was mailed out in early September 2012 (see Figure 4. A total of 8,441 newsletters were sent to all stakeholders within ½ mile of the trail. Additionally, information about the open house was sent out in a Neighborhood News

e-mail and was posted on the Choose Your Way Bellevue Website. An article on the open house also appeared in the Bellevue Reporter newspaper on September 24, 2012.

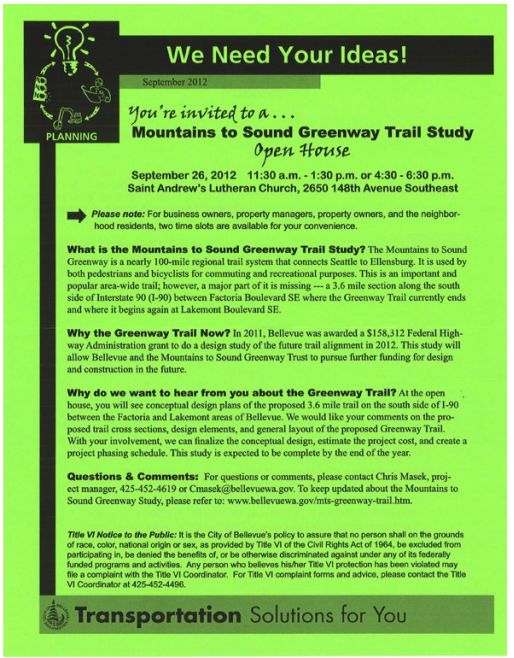
OPEN HOUSES

On September 26, 2012 two open houses were held from 11:30 am – 1:30 pm and from 4:30 pm – 6:30 pm at Saint Andrews Lutheran Church (see Figure 5). Conceptual plans were presented for public comment at each open house. The posters displayed can be found on the project study **website** .

Fifteen individuals signed in at the 11:30 a.m. – 1:30 p.m. open house. Some help was needed to orient people on how to view the conceptual design. However, after attendees figured out where the trail started and ended, they did not have any concerns about the placement of the trail. There were questions about the safety of walkers and bikers on a 12' trail. Many wanted to know how pedestrians and bicycles would be separated on the trail. One option to consider would be to install a centerline on the trail. Whether or not to install a centerline or dashed centerline will be determined based on the AASHTO Guide for Bike Facilities and based on the operation of the trail after construction.

Eleven individuals signed in at the 4:30 – 6:30 p.m. open house. There were requests for clear signage so that people know where the trail goes and that the trail is intended for both pedestrians and bicycles. Additional concerns were raised about the separation of bicycles and pedestrians on the trail. There were also some concerns raised about eliminating the bike lane on SE 36th St from the Honda dealership eastward to build the trail.

For both open houses, all attendees thought it was a good design. Only one attendee said that the design would not work for the area where he bikes and that he didn't like the engineering that was done on the project and other City of Bellevue projects. There were a significant number of people who live along SE Newport Way who were initially concerned about the placement of the trail but were relieved to hear that the trail would be placed in the undeveloped area between SE Newport Way and I-90. There were two requests for sidewalks on SE Newport Way which was outside of the scope of the project.



We Need Your Ideas!

September 2012

PLANNING

You're invited to a . . .

Mountains to Sound Greenway Trail Study

Open House

September 26, 2012 11:30 a.m. - 1:30 p.m. or 4:30 - 6:30 p.m.
Saint Andrew's Lutheran Church, 2650 148th Avenue Southeast

Please note: For business owners, property managers, property owners, and the neighborhood residents, two time slots are available for your convenience.

What is the Mountains to Sound Greenway Trail Study? The Mountains to Sound Greenway is a nearly 100-mile regional trail system that connects Seattle to Ellensburg. It is used by both pedestrians and bicyclists for commuting and recreational purposes. This is an important and popular area-wide trail; however, a major part of it is missing --- a 3.6 mile section along the south side of Interstate 90 (I-90) between Factoria Boulevard SE where the Greenway Trail currently ends and where it begins again at Lakemont Boulevard SE.

Why the Greenway Trail Now? In 2011, Bellevue was awarded a $158,312 Federal Highway Administration grant to do a design study of the future trail alignment in 2012. This study will allow Bellevue and the Mountains to Sound Greenway Trust to pursue further funding for design and construction in the future.

Why do we want to hear from you about the Greenway Trail? At the open house, you will see conceptual design plans of the proposed 3.6 mile trail on the south side of I-90 between the Factoria and Lakemont areas of Bellevue. We would like your comments on the proposed trail cross sections, design elements, and general layout of the proposed Greenway Trail. With your involvement, we can finalize the conceptual design, estimate the project cost, and create a project phasing schedule. This study is expected to be complete by the end of the year.

Questions & Comments: For questions or comments, please contact Chris Masek, project manager, 425-452-4619 or Cmasek@bellevuewa.gov. To keep updated about the Mountains to Sound Greenway Study, please refer to: www.bellevuewa.gov/mts-greenway-trail.htm.

Title VI Notice to the Public: It is the City of Bellevue's policy to assure that no person shall on the grounds of race, color, national origin or sex, as provided by Title VI of the Civil Rights Act of 1964, be excluded from participating in, be denied the benefits of, or be otherwise discriminated against under any of its federally funded programs and activities. Any person who believes his/her Title VI protection has been violated may file a complaint with the Title VI Coordinator. For Title VI complaint forms and advice, please contact the Title VI Coordinator at 425-452-4496.

Transportation Solutions for You

FIGURE 4 Newsletter distributed about the project and the open house.

FIGURE 5 Cynthia Welti and Chris Masek ask for input from residents and business owners at the open houses.

PROMOTIONAL VIDEO

The City worked with the WSDOT Visual Engineering Resource Group (VERG) to produce a promotional video of the Mountains to Sound Greenway Trail project. The video features key stakerholders from the City of Bellevue, WSDOT, Cascade Bicycle Club, Microsoft, and the Mountains to Sound Greenway Trust speaking out in support of filling in the missing 3.6 mile "Bellevue Gap" in the Greenway Trail. The video also features 3D rendering of the proposed trail alignment. The video will be helpful in conveying the importance of the trail to the public as well as pursuing grant opportunities. The video will be completed in January 2013.

04
PREFERRED ALIGNMENT

PREFERRED ALIGNMENT

INTRODUCTION

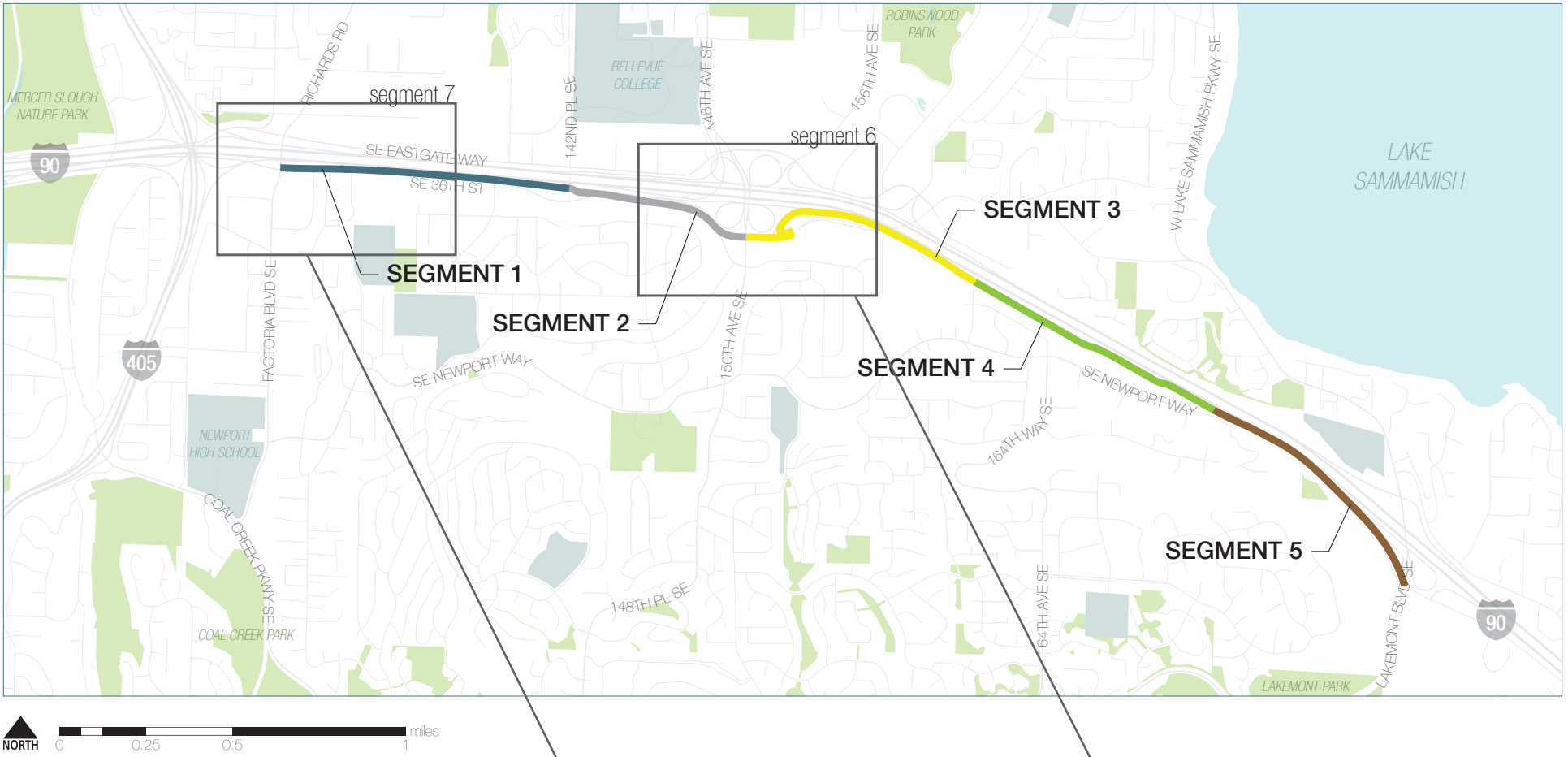
For the purpose of describing elements of the proposed trail and estimating the cost, the trail has been broken into the following segments (see Figure 6):

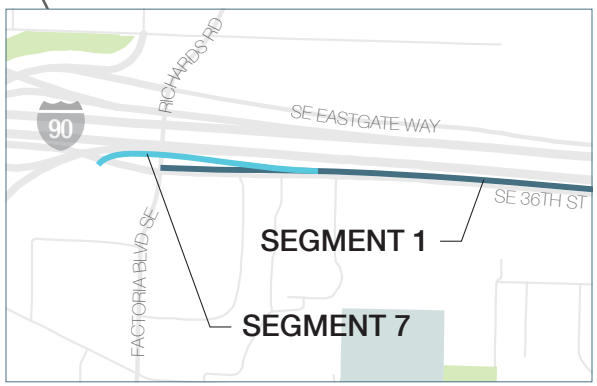
- Segment 1: At Grade Trail – Factoria Blvd SE to 142nd Pl SE
- Segment 2: At Grade Trail – 142nd Pl SE to 150th Ave SE
- Segment 3: At Grade Trail – 150th Ave SE to 161st Ave SE
- Segment 4: At Grade Trail – 161st Ave SE to SE Newport Way Trail Crossing
- Segment 5: At Grade Trail – SE Newport Way Trail Crossing to Lakemont Blvd SE
- Segment 6: 150th Ave SE Vicinity Flyover Bridge
- Segment 7: Factoria Blvd SE Vicinity Flyover Bridges

EXISTING CONDITIONS

SEGMENT 1

Segment 1 covers the area between Factoria Blvd SE and 142nd Pl SE along SE 36th St (see Figure 7 on page 17). SE 36th St varies from two to four lanes between Factoria Blvd SE and 142nd Pl SE. The posted speed limit is 35 MPH and there are ±5 foot paved shoulders on both side of the street which are sometimes marked as bike lanes. There is also a 6 foot concrete sidewalk located on the south side of SE 36th St between Factoria Blvd and 142nd Pl SE. The sidewalk follows the street but is not always adjacent to the street. A grass buffer





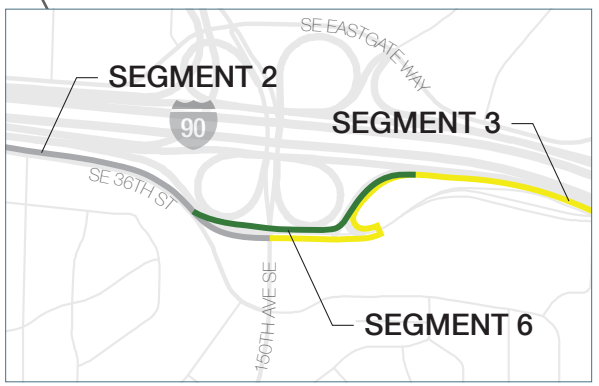


FIGURE 6 Map of trail segments.

LEGEND

- segment 1
- segment 2
- segment 3
- segment 4
- segment 5
- segment 6
- segment 7

exists between the eastbound lanes of I-90 and westbound lane of SE 36th St. Mechanically Stabilized (MSE) walls are located along the northside of SE 36th St from Factoria Blvd SE to 365 feet east and along I-90 for 2,450 feet from 142nd Pl SE westward. A 350 foot rockery is located on the southside of SE 36th St west of 136th Pl SE. Street lighting is on both sides of the street and there are 5 traffic signals within the segment. Land use along this segment is zoned as commercial and office space.

SEGMENT 2

Segment 2 covers the area between 142nd Pl SE and 150th Ave along SE 36th St including the signalized intersection of 150th Ave SE and SE 37th St (see Figure 8 on page 18). SE 36th St varies from two and three lanes between 142nd Pl SE and SE Allen Rd. The posted speed limit is 35 MPH and there are ±5 foot paved shoulders on both side of the street which are marked as bike lanes for most of the length. A 6 or 8 foot concrete sidewalk is located on the south side of SE 36th St between 142nd Pl SE and 150th Ave SE. A grass buffer exists between the eastbound lanes of I-90 and westbound lane of SE 36th St until the U-Turn on SE 36th St. From the U-Turn eastward, the roadway narrows to no buffer. There are currently no crosswalks that serve the intersection of 150th Ave SE and SE 37th St. Sidewalk is only present on the southeast corner of the intersection of SE 37th St and 150th Ave SE. There is an existing mid-block crosswalk on SE 36th St west of SE Allen Rd where the pedestrian bridge meets SE 36th St. Two MSE walls separate SE 36th St from I-90. A 480 foot soldier pile wall is located on the southside of SE 36th St west SE Allen Rd. Street lighting is on both sides of the street. Land use along this segment is zoned as commercial, multi-family and office space

SEGMENT 3

Segment 3 covers the area between 150th Ave SE and 161st Ave SE along I-90 and SE 37th St (see Figure 9 on page 19). SE 37th St varies from two and three lanes between 150th Ave SE and the end of the road at Crossroads Bible Church. The posted speed limit is 30 MPH. There are shoulders in places and a designated parking lane on the north side of SE 37th St between 156th Ave SE and the end of the road. There is also a 6 to 8 foot asphalt/concrete walkway located on the south side of SE 37th St between 150th Ave SE and 156th Ave SE. Street lighting is on both sides of SE 37th St. The area between where SE 37th St ends and

Factoria Blvd SE and SE 36th St (looking NE)

FIGURE 7 Existing aerials of Segment 1 from Factoria Blvd SE (left) to 142nd Pl SE (bottom right).

SE 36th St (looking E)

142nd Pl SE and SE 36th St (looking NW)

142nd Pl SE and SE 36th St (looking NE)

FIGURE 8 Existing aerials of Segment 2 from 142nd Pl SE (left) to 150th Ave SE (bottom right).

SE 36th St (looking E)

150th AVE SE and I-90 OFF-Ramp (looking W)

150th Ave SE and SE 37th St (looking E)

161st Ave SE (looking NW)

FIGURE 9 Existing aerials of Segment 3 from 150th Ave SE (top) to 161st Ave SE (bottom).

161st Ave SE is an undeveloped and wooded area that is bound by single family residences to the south and I-90 to the north. Land use along this segment is zoned as commercial, office space and single family.

SEGMENT 4

Segment 4 is located in the undeveloped WSDOT Right of way between single family homes to the south and I-90 to the north (see Figure 10). The area covered under this segment is from 161st Ave SE to the pedestrian bridge crossing over I-90 at SE Newport Way. The area is heavily wooded with three stream crossings (more information on the stream crossings can be found in the Environmental Considerations Section). Land use along this segment is classified as single family.

SEGMENT 5

Segment 5 is located between the pedestrian bridge over I-90 at Newport and Lakemont Blvd SE (see Figure 11 on page 22). There are no properties that have frontage on SE Newport Way in this segment. SE Newport Way is a two lane roadway with wide lanes and a ±12 foot wide shoulder on the north side of the road. The posted speed limit is 50 MPH. SE Newport Way borders I-90 for most of the segment except the last 1,150 feet which has a buffer between the I-90 off-ramps and SE Newport Way. SE Newport Way is retained above I-90 by two large MSE Walls. Land use along this segment is classified as single family and multi-family.

SEGMENT 6

Segment 6 is located within Segment 3 (see Figure 12 on page 23). See Segment 3 for a description of the existing conditions.

SEGMENT 7

Segment 7 is located within Segment 1 (see Figure 13 on page 23). See Segment 1 for a description of the existing conditions.

SE Newport Way (looking SE)

SE Newport Way trail crossing over I-90 (looking SE)

FIGURE 10 Existing aerial of Segment 4 from 161st Ave SE to SE Newport Way trail crossing (top) and ground view of SE Newport Way trail crossing over I-90 (bottom).

SE Newport Way (looking NW)

SE Newport Way and Lakemont Blvd SE (looking SE)

FIGURE 11 Existing aerials of Segment 5 from SE Newport Way trail crossing (left) to Lakemont Blvd SE (right).

150th Ave SE and I-90 Off-Ramp (looking NE)

FIGURE 12 Existing aerial of Segment 6, 150th Ave SE vicinity flyover bridge.

Factoria Blvd SE and SE 36th St (looking N)

FIGURE 13 Existing aerial of Segment 7, Factoria Blvd SE vicinity flyover bridge.

RIGHT OF WAY ANALYSIS

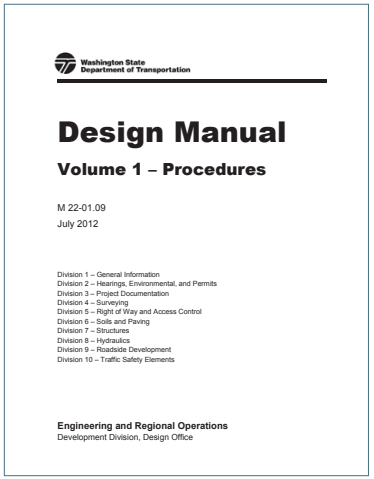
The dimensions of the existing right of way vary throughout the length of the project. The existing dimensions of City of Bellevue Right of Way and WSDOT Limited Access are shown in the in the WSDOT Right of Way plans shown in Appendix D on page A-51 of the Appendices to this report.

The proposed trail will be constructed within City of Bellevue Right of Way and WSDOT Limited Access in all project segments including all walls and offsets, except for the Pizza Hut Parcel at 15210 SE 37th St. An easement or right of way will need to be purchased from the Pizza Hut parcel. Since the trail is assumed to be operated and maintained by the City of Bellevue, the City will need to obtain an airspace lease and a break in Limited Access for the trail within WSDOT Limited Access areas.

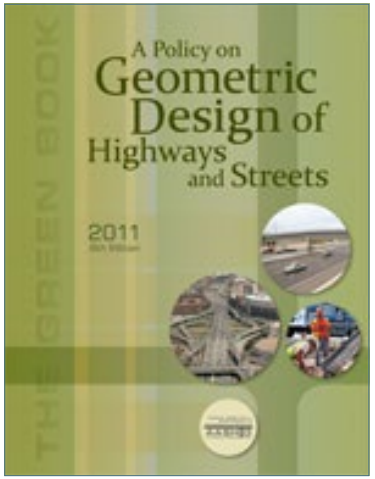
TRAIL DESIGN STANDARDS

The following design standards were identified and suggested by the project team and will be used to design and construct the trail (see Figure 14):

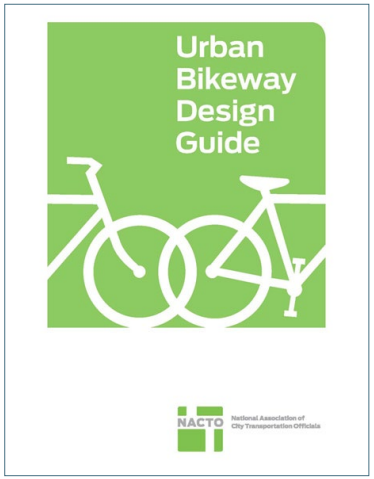
- Washington State Department of Transportation Design Manual, July 2012
- City of Bellevue Transportation Department Design Manual and Standards, 2011
- AASHTO's Policy on Geometric Design of Highways and Streets, 2011
- National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide, 2012
- AASHTO's Guide for the Development of Bicycle Facilities, 2012
- City of Bellevue Utilities Engineering Standards, 2012
- 2005 Washington State Department of Ecology Stormwater Manual for Western Washington
- King County Metro Standards for Bus Stop Layouts
- ADA and ABA Accessibility Guidelines, 2004
- Manual on Uniform Trafic Control Devices (MUTCD), 2009
- United States Access Board, Proposed Accessibility Guidelines for Pedestrian Facilities in Public Right-of-Way (PROWAG), 2009
- King County Regional Trails System Draft Development Guidelines, 2009



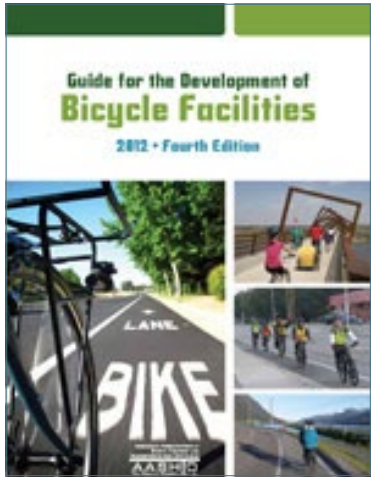
WSDOT Design Manual



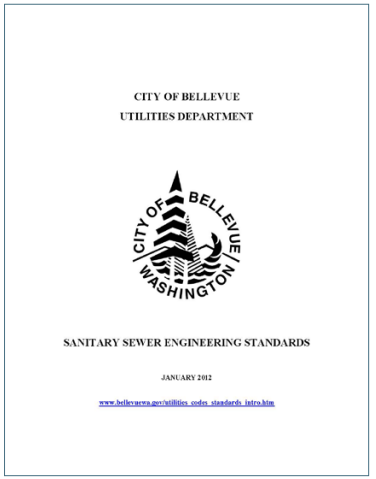
AASHTO's Policy on Geometric Design of Highways and Streets



NACTO Urban Bikeway Design Guide

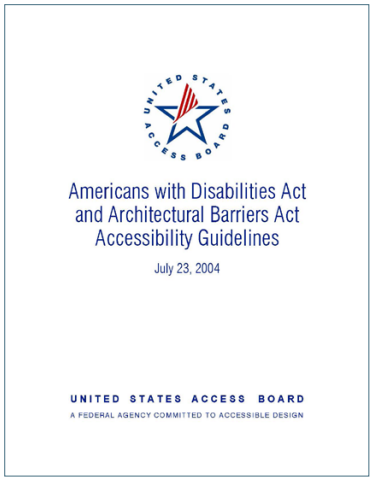


AASHTO's Guide for the Development of Bicycle Facilities

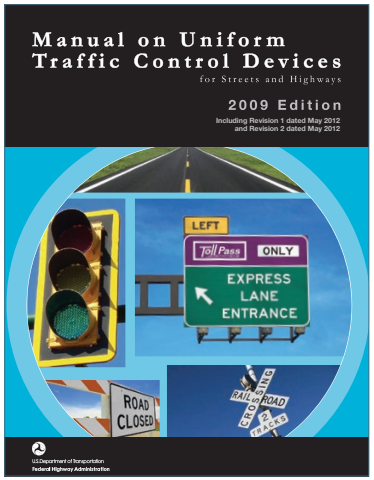


Bellevue Utilities Engineering Standards

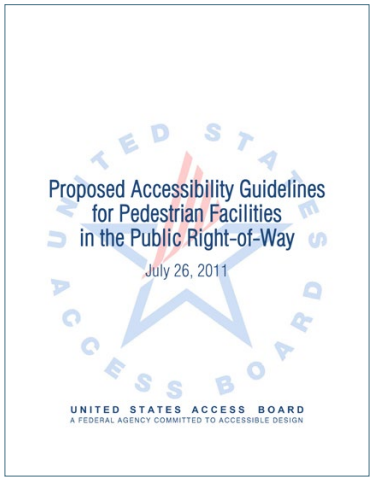
Stormwater Manual



ADA & ABA Accessibility Guidelines



MUTCD



Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Ways

FIGURE 14 Select covers from the trail design standards identified to guide design and construction of the trail.

PRELIMINARY TRAIL DESIGN ELEMENTS

TRAIL ALIGNMENT DESCRIPTION

The route of the trail within each segment is briefly described below. Plan view diagrams and select photovisualizations follow the descriptions on page 28 through page 54. Typical sections referenced on the plan view diagrams are on page 56 through page 64. Conceptual design plans are also found in Appendix A on page A-1 of the Appendices to this report.

Segments 1 and 7 (Figure 15 on page 28 – Figure 24 on page 37; typical sections on page 56 – page 62): The final proposed alignment for the Mountains to Sound Greenway Trail begins at the Factoria Trail Connection (see Figure 15 on page 28). The trail crosses over the I-90 off-ramp at Factoria Blvd and over Factoria Blvd on concrete bridges (see Figure 15 on page 28 – Figure 17 on page 30). The trail then merges with an at grade trail connection to Factoria Blvd SE. The trail proceeds east along the northside of SE 36th St until it reaches the intersection at 136th Pl SE. A 15 foot buffer is included at the request of WSDOT between the edge of the trail and the existing I-90 eastbound shoulder for possible future widening of I-90 (see Figure 19 on page 32 and Figure 21 on page 34); the buffer is also intended to preserve existing roadside features such as sign structures and gantries. Sections of shoulder on SE 36th St will be removed to construct the trail due to space constraints. Medians will be installed in locations where turn lanes are not needed to create a more park-like experience. The medians may be narrowed in places to allow for 14' wide uphill lanes for cyclists who choose to continue using SE 36th St rather than the trail. After the trail passes the intersection of 136th Pl SE, the trail moves away from SE 36th St and goes under the existing 142nd Pl SE bridge (see Figure 22 on page 35 – Figure 24 on page 37). A trail connection to the Eastgate Park & Ride will be provided on the east side of the 142nd Pl SE bridge.

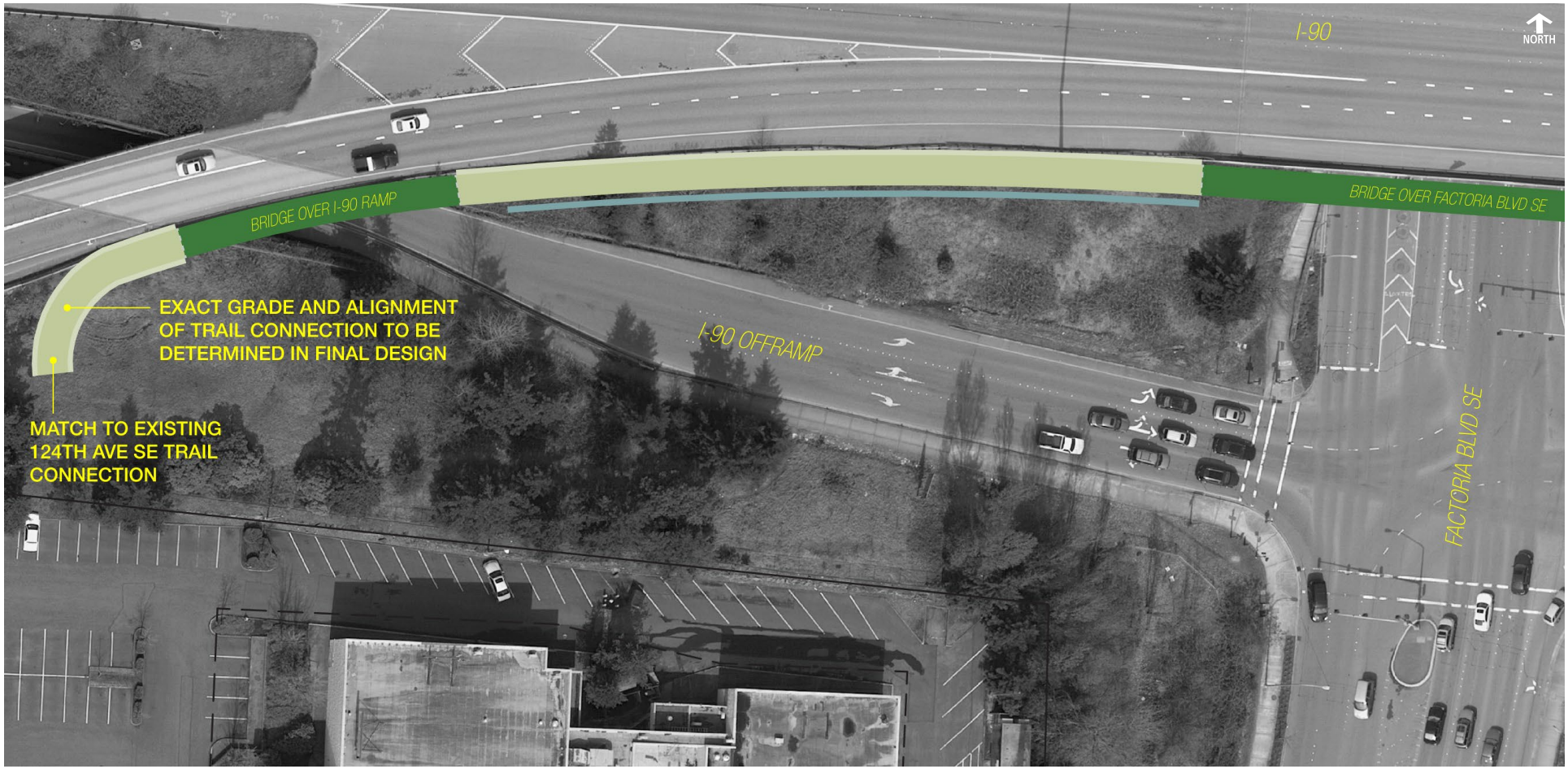
Segment 2 (Figure 25 on page 38 – Figure 27 on page 40; typical sections on page 58 and page 59): The trail continues east and follows SE 36th St until the trail reaches the existing pedestrian crossing over I-90 (see Figure 25 on page 38 – Figure 27 on page 40). From there, the trail goes under the existing pedestrian bridge and meets up with 150th Ave SE. New crosswalks and signal modifications will allow pedestrians and cyclists to cross 150th Ave SE.

Segment 3 (Figure 28 on page 41 – Figure 34 on page 46; typical sections on page 62 and page 63): The trail follows the south side of SE 37th St to the Pizza Hut and crosses over to the north side of the street with a new mid-block crosswalk (see Figure 28 on page 41). The trail then continues on the north side of the Pizza Hut, 76 Gas Station, and vacant commercial building and links up with SE 37th St at 156th Ave SE (see Figure 32 on page 44 and Figure 33 on page 45). The trail continues along SE 37th St to where the public street ends at Crossroads Bible Church. From there, the trail enters the undeveloped WSDOT right of way and continues to a neighborhood trail connection at 161st Ave SE.

Segment 4 (Figure 34 on page 46 – Figure 38 on page 50; typical section on page 62): The trail continues to the east from 161st Ave SE within undeveloped WSDOT right of way (see Figure 34 on page 46). A trail connection is provided to the neighborhood at 164th Ave SE (see Figure 35 on page 47). The trail crosses over three unnamed streams to the existing pedestrian bridge over I-90 at SE Newport Way (see Figure 37 on page 49 and Figure 38 on page 50).

Segment 5 (Figure 39 on page 51 – Figure 42 on page 54; typical sections on page 62 and page 64): The trail leaves the undeveloped WSDOT right of way and joins up with SE Newport Way above I-90 and follows SE Newport Way (see Figure 39 on page 51 – Figure 41 on page 53). The trail will occupy the existing wide shoulder space on SE Newport Way for 2,300 feet before moving away from the road and joining up with Lakemont Blvd SE (Figure 42 on page 54). The last 1,100 feet of the trail is located in undeveloped WSDOT right of way.

Segment 6 (Figure 27 on page 40 – Figure 31 on page 43; typical section on page 62): This trail segment is a bridge that bypasses the busy intersections of 150th Ave SE and SE 37th St and the I-90 off-ramps (see Figure 27 on page 40 and Figure 28 on page 41) The bridge will join up with or flyover the existing pedestrian bridge to the north at SE 36th St (see Figure 27 on page 40 and Figure 30 on page 43). This Bridge will bypass the end of Segment 2 and the first part of Segment 3. The at-grade trail system that is bypassed will remain as a point of connection for the Greenway trail to the surrounding neighborhoods and local businesses. The placement of the bridge in the figures is one possible placement; exact placement and connection details will be determined during the final design.

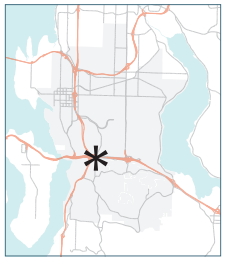


MATCH TO FIGURE 16

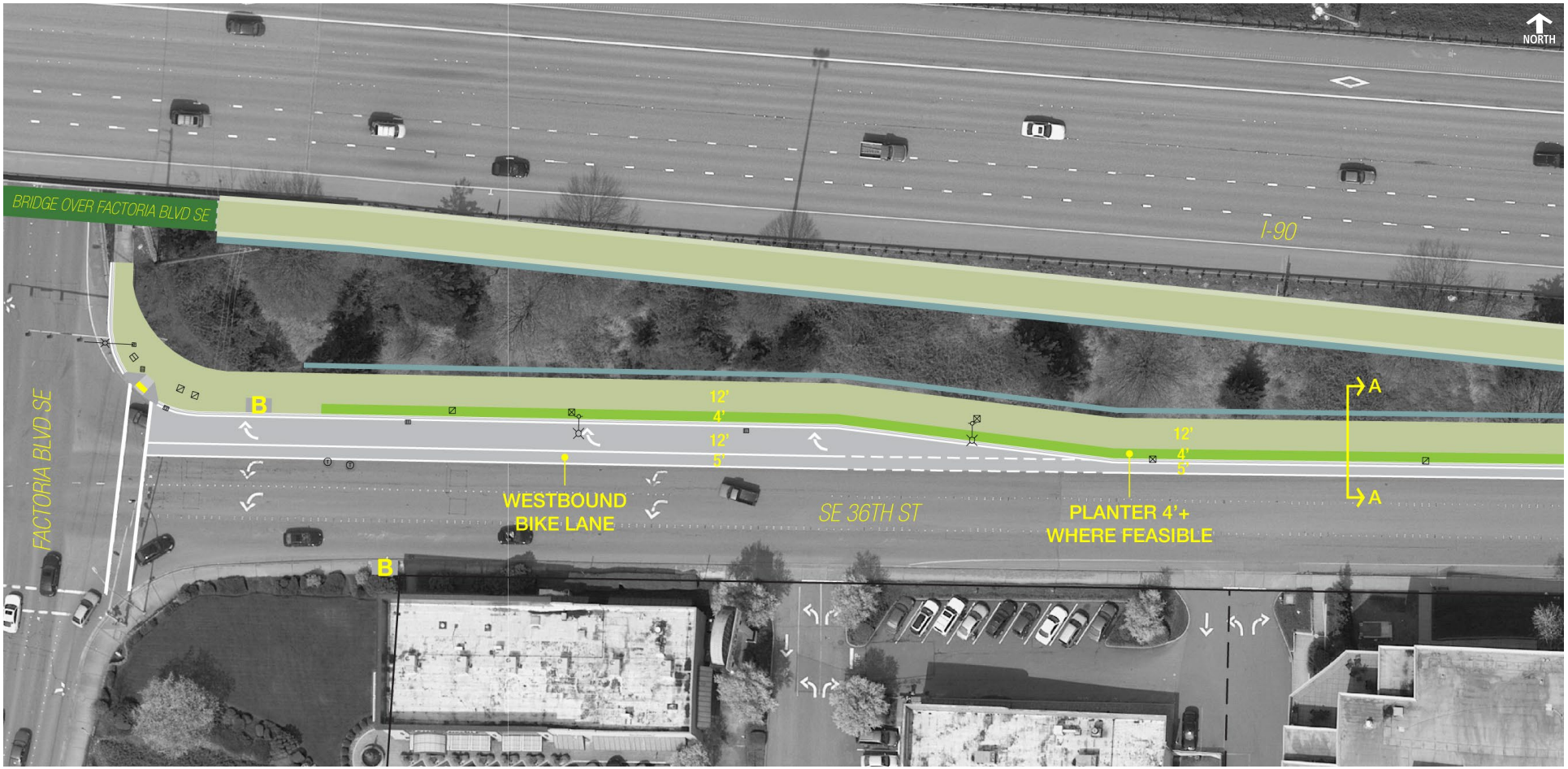
FIGURE 15 West end of the trail at Factoria Blvd SE.

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements



MATCH TO FIGURE 15



MATCH TO FIGURE 18 ON PAGE 31

FIGURE 16 Trail crossing over Factoria Blvd SE and continuing east on SE 36th St.

*typical section is on page 56

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements

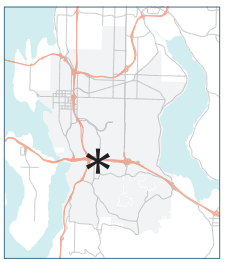
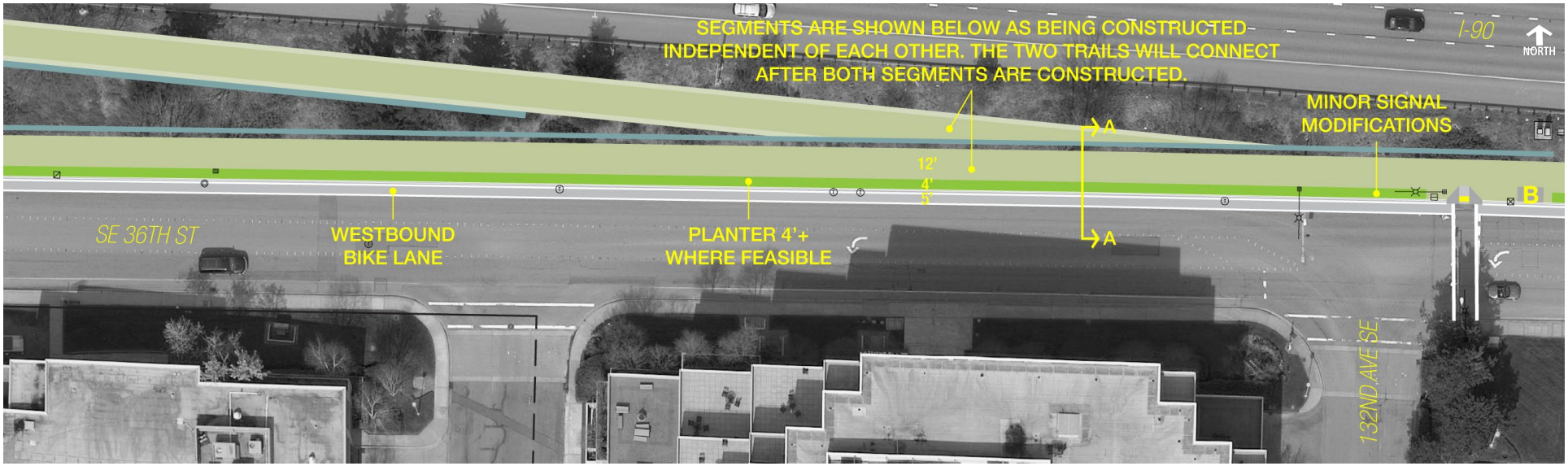


FIGURE 17 Factoria Blvd SE and SE 36th St showing the proposed trail (looking NW).

MATCH TO FIGURE 16 ON PAGE 29



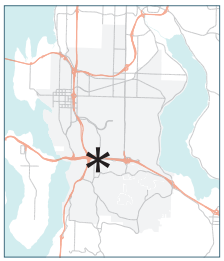
MATCH TO FIGURE 19 ON PAGE 32

FIGURE 18 Trail continuing east on SE 36th St.

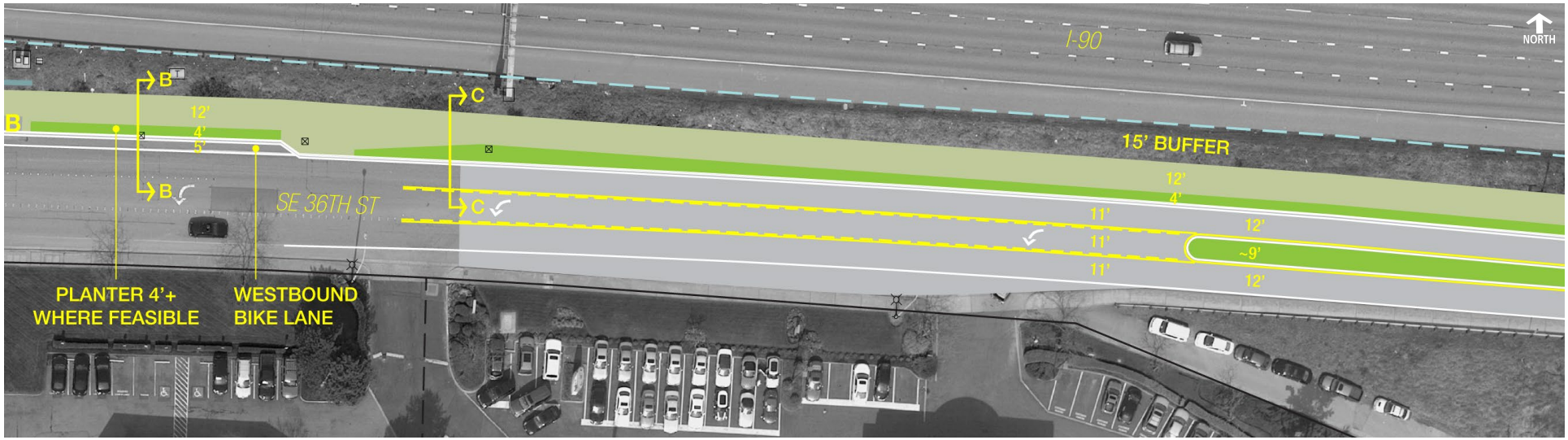
*typical section is on page 56

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements

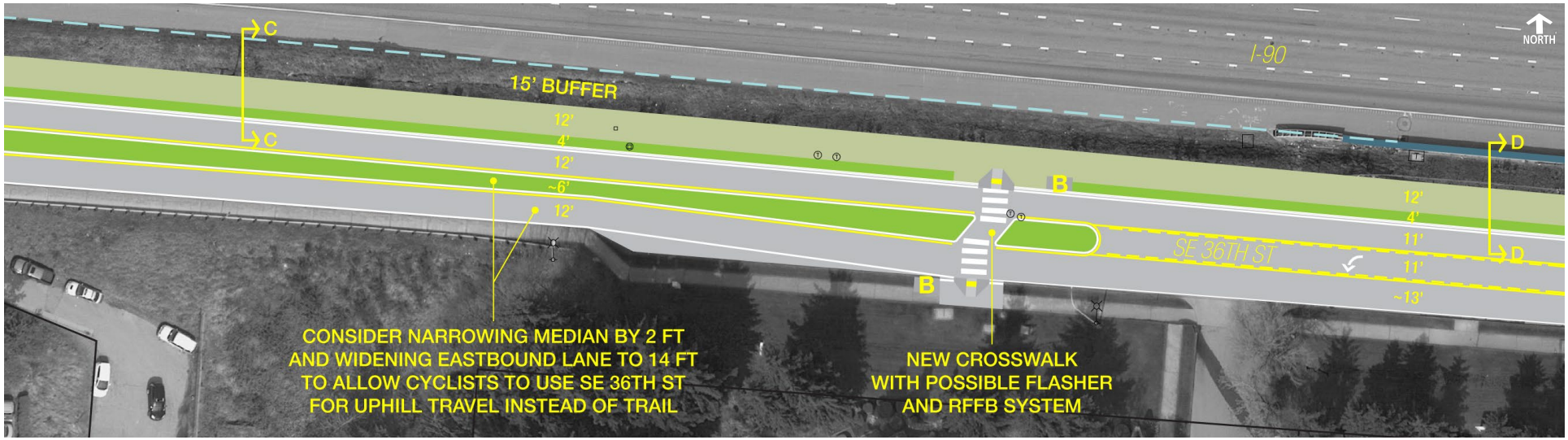


MATCH TO FIGURE 18 ON PAGE 31



MATCH TO BELOW IMAGE

MATCH TO ABOVE IMAGE



MATCH TO FIGURE 21 ON PAGE 34

FIGURE 19 Trail between Factoria Blvd SE and crosswalk at Group Health on SE 36th St.

*typical sections are on page 57 through page 59

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements

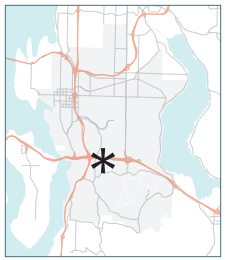
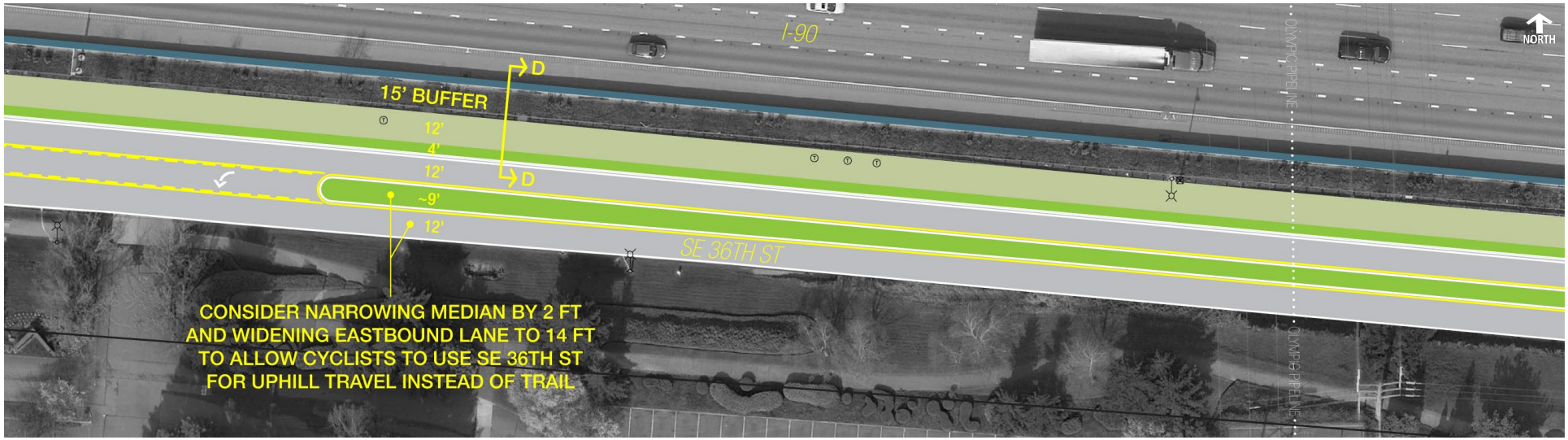


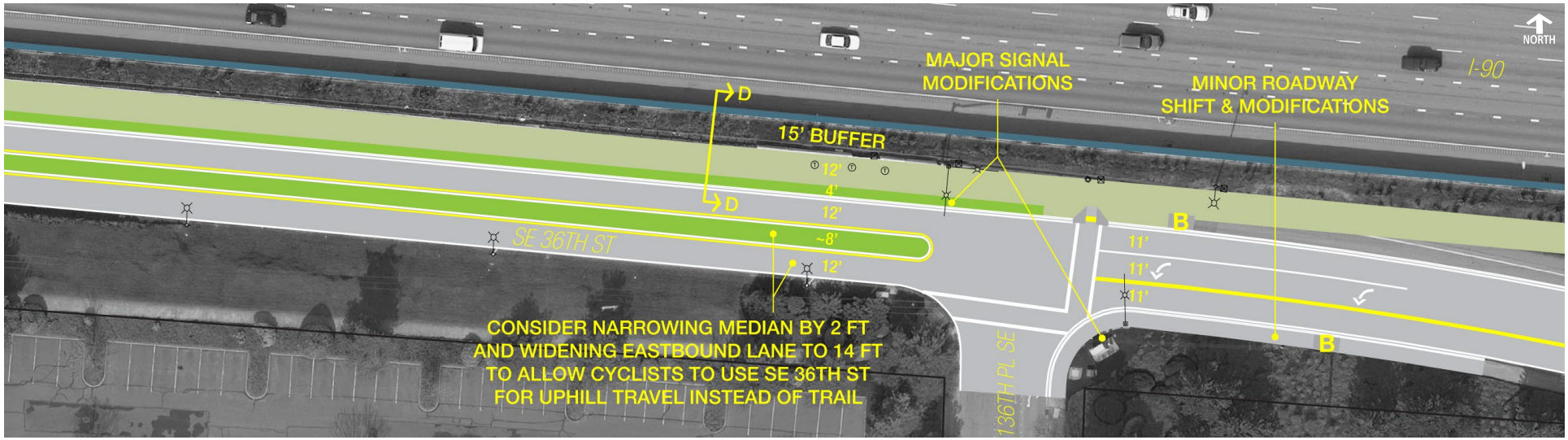
FIGURE 20 At-grade photovisualiztion of trail and new crosswalk on SE 36th St (looking W).

MATCH TO FIGURE 19 ON PAGE 32



MATCH TO BELOW IMAGE

MATCH TO ABOVE IMAGE



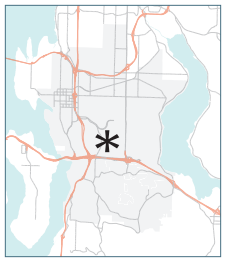
MATCH TO FIGURE 22

FIGURE 21 Trail between crosswalk at Group Health and 136th Pl SE on SE 36th St.

*typical sections are on page 59

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements



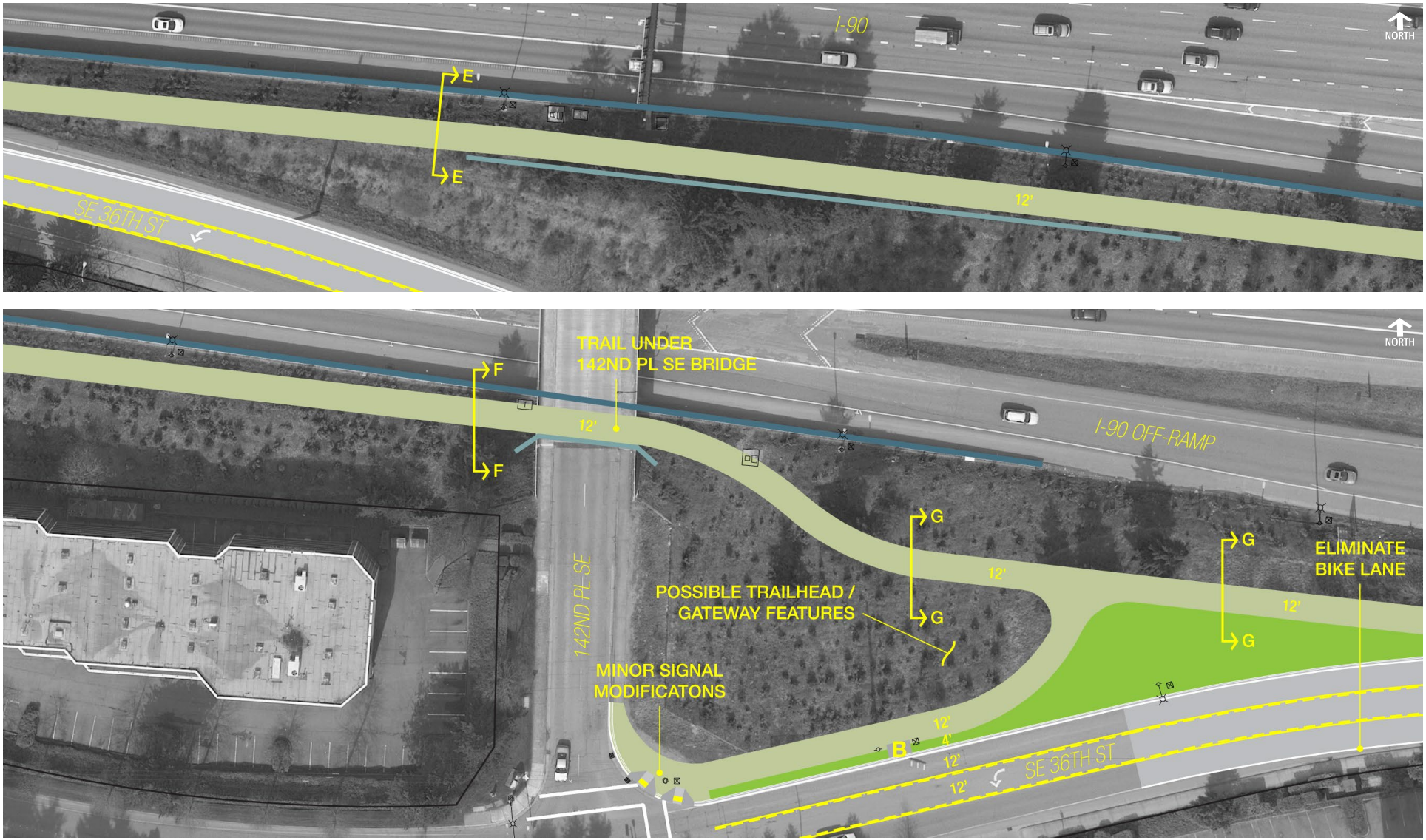


FIGURE 22 Trail between 136th Pl SE and 142nd Pl SE on SE 36th St.

*typical sections are on page 60 through page 62

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements

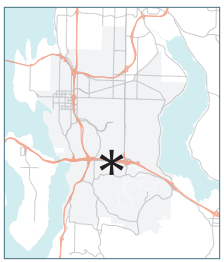


FIGURE 23 Aerial photovisualiztion of trail crossing under the existing 142nd Pl SE bridge.

FIGURE 24 At-grade photovisualiztion of trail crossing under the existing 142nd Pl SE bridge.

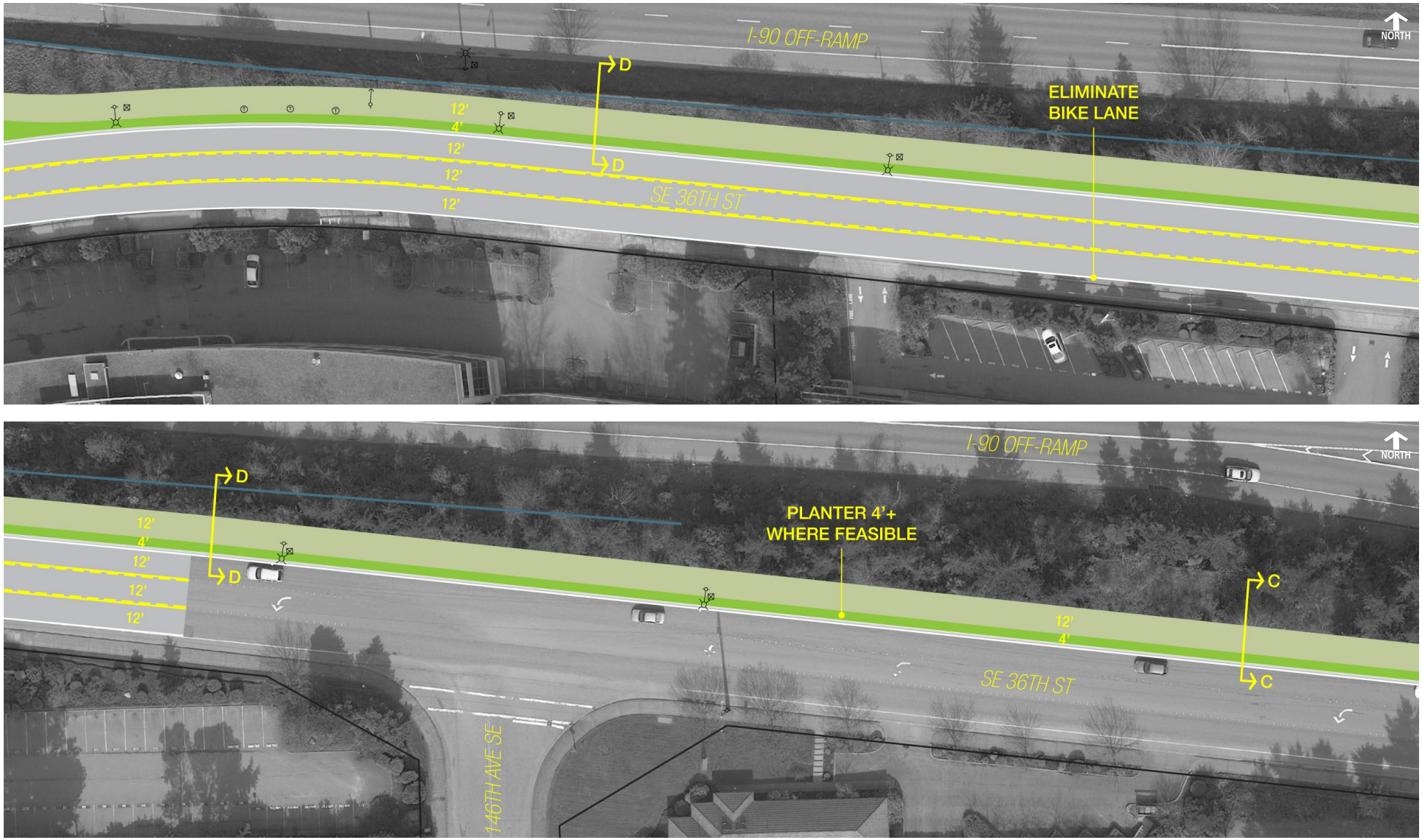
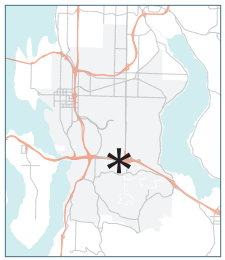


FIGURE 25 Trail east of 142nd Pl SE on SE 36th St before reaching 150th Ave SE.

*typical sections are on page 58 and page 59

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements



MATCH TO FIGURE 25

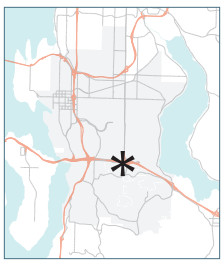
MATCH TO FIGURE 27 ON PAGE 40

FIGURE 26 Trail east of 142nd Pl SE on SE 36th St before reaching 150th Ave SE.

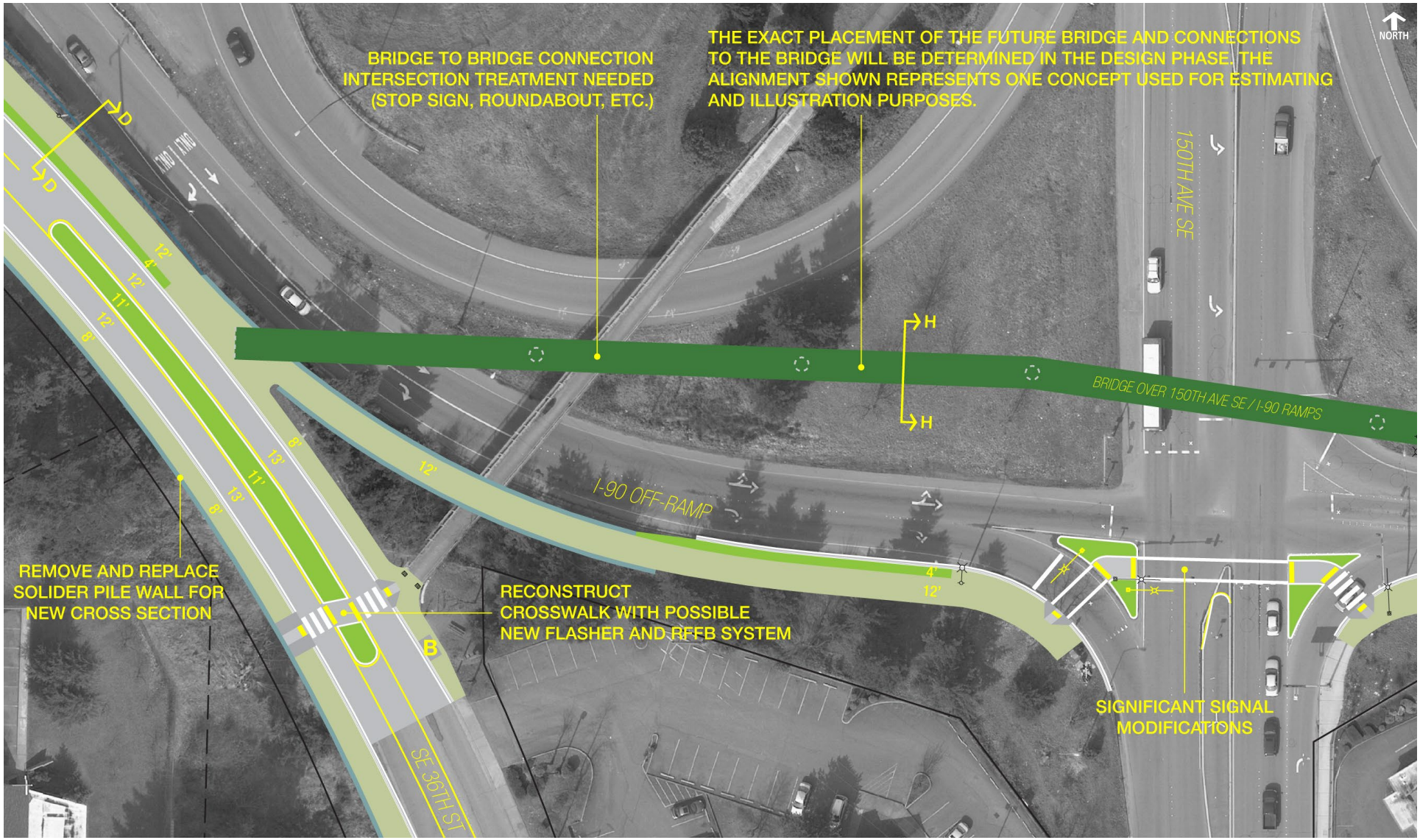
*typical sections are on page 58 and page 59

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements



MATCH TO FIGURE 26 ON PAGE 39



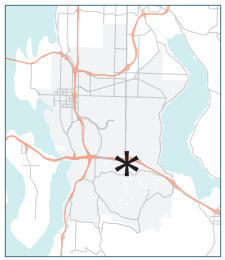
MATCH TO FIGURE 28

FIGURE 27 At grade trail and bridge crossing over 150th Ave SE at the I-90 Off-Ramp.

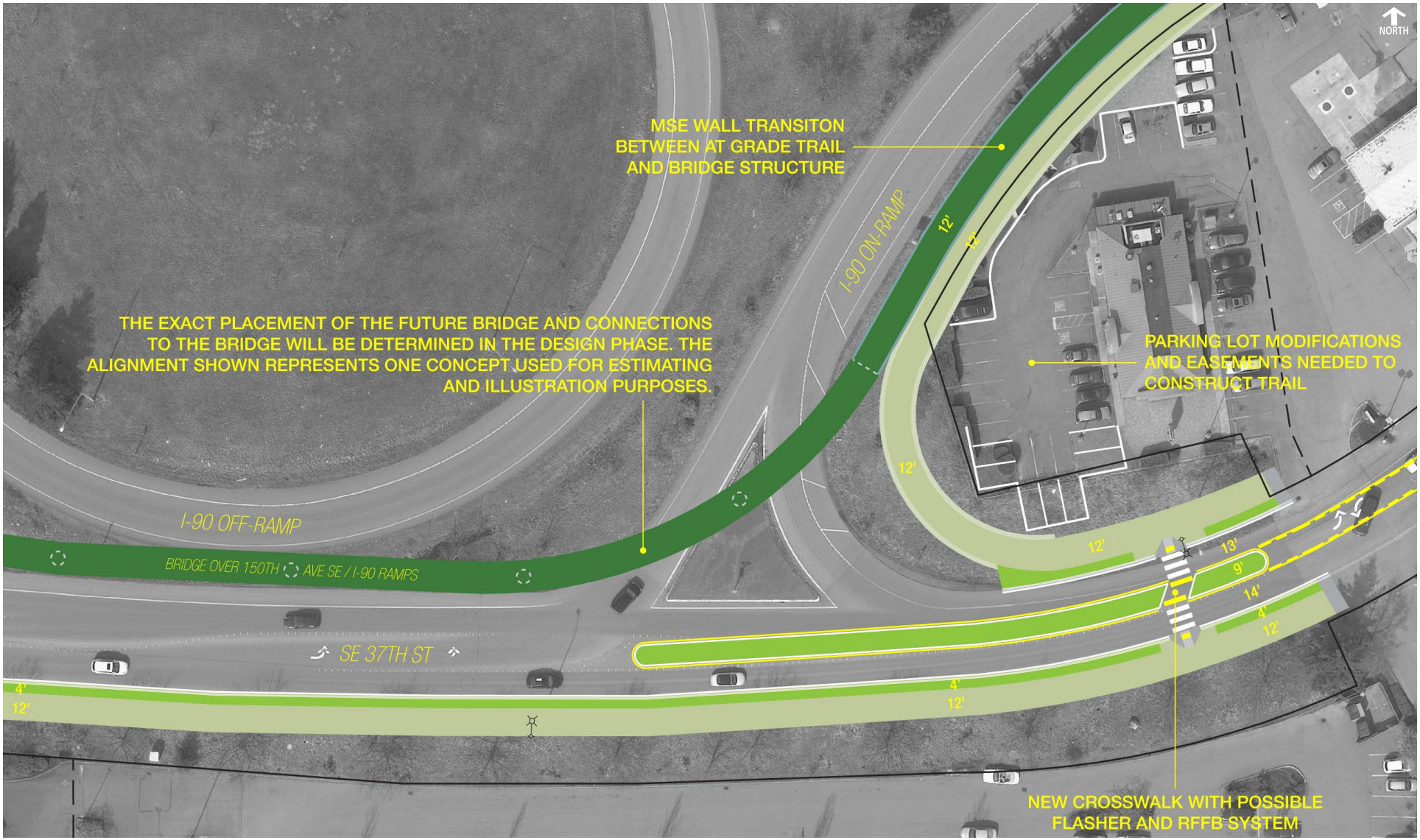
*typical sections are on page 59 and page 62

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements



MATCH TO FIGURE 32 ON PAGE 44



MATCH TO FIGURE 27

FIGURE 28 At grade and bridge trail east of 150th Ave SE to the Pizza Hut.

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements

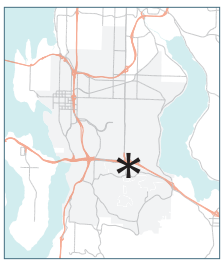


FIGURE 29 Photovisualiztion of the bridge crossing over 150th Ave SE as a long range alternative to bypass the busy intersection of 150th Ave SE and SE 37th St (looking north).

FIGURE 30 Photovisualiztion of the bridge crossing over 150th Ave SE joining up with the existing pedestrian bridge to the north of SE 36th St (looking east).

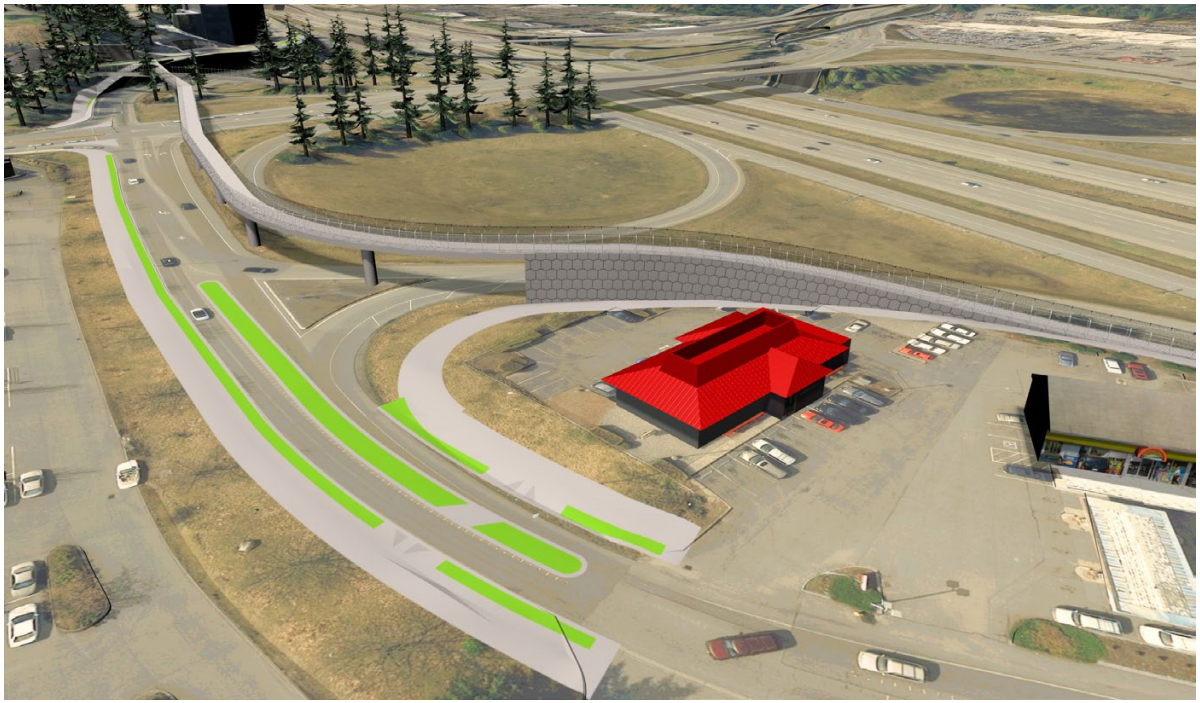
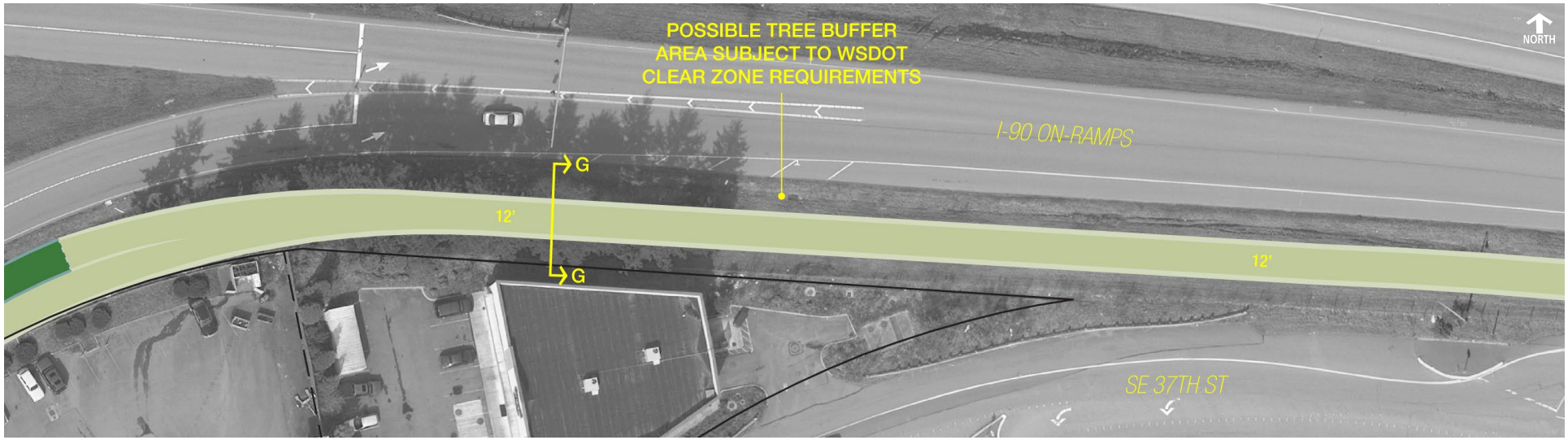


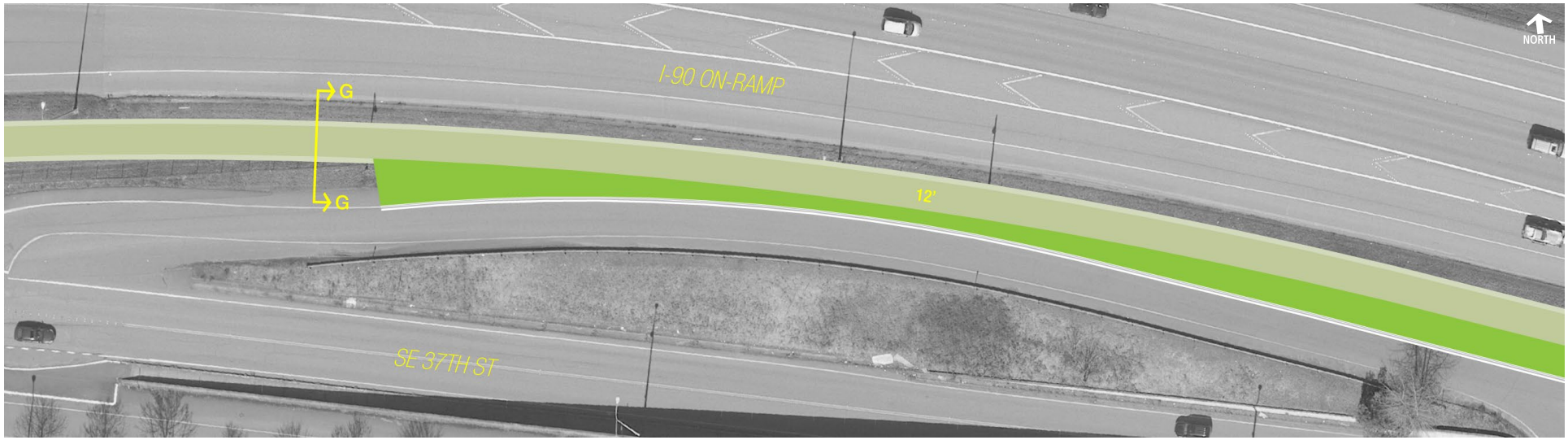
FIGURE 31 Photovisualiztion of the bridge crossing over 150th Ave SE where it meets with the at-grade trail behind the Pizza Hut (looking west).

MATCH TO FIGURE 28 ON PAGE 41



MATCH TO BELOW IMAGE

MATCH TO ABOVE IMAGE



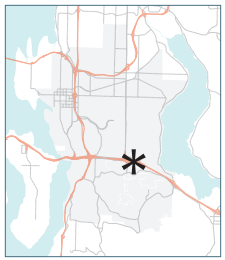
MATCH TO FIGURE 33

FIGURE 32 Trail travels behind the Pizza Hut, 76 Gas Station, and vacant commercial building before reconnecting with SE 37th St at 156th Ave SE.

*typical sections are on page 62

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements



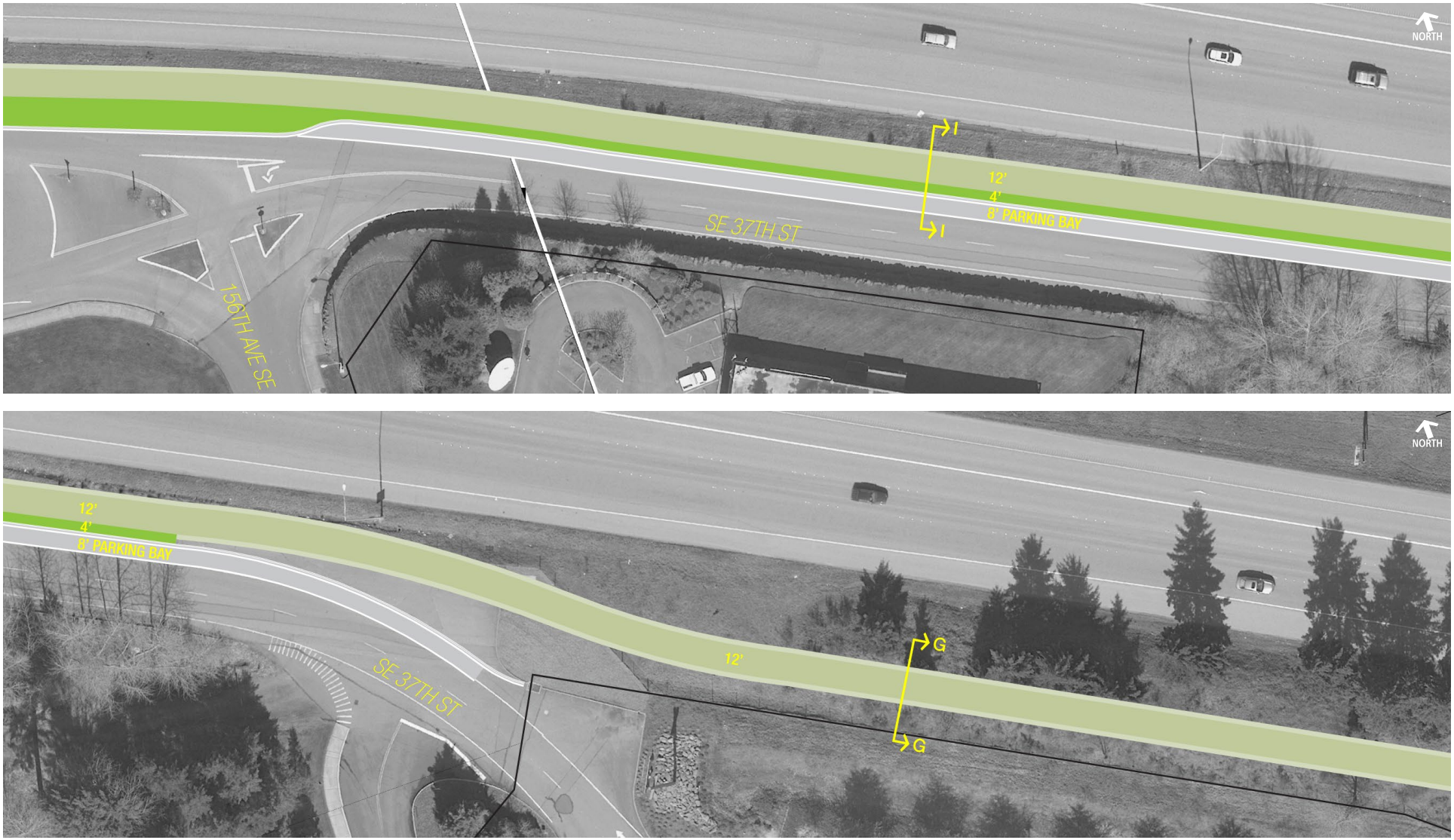
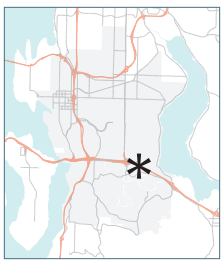


FIGURE 33 Trail reconnects with SE 37th St at 156th Ave SE (top) before continuing into undeveloped WSDOT right-of-way (bottom).

*typical sections are on page 62 and page 63

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements



MATCH TO FIGURE 33 ON PAGE 45

MATCH TO BELOW IMAGE

MATCH TO ABOVE IMAGE

MATCH TO FIGURE 35

FIGURE 34 Trail makes a trail connection at 161st Ave SE in undeveloped WSDOT right-of-way and continues east.

*typical sections are on page 62

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements

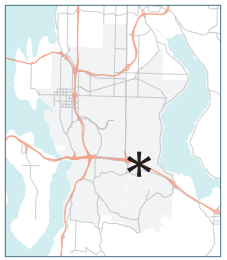


FIGURE 35 Trail makes a trail connection at 164th Ave SE in undeveloped WSDOT right-of-way and continues east.

*typical sections are on page 62

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements

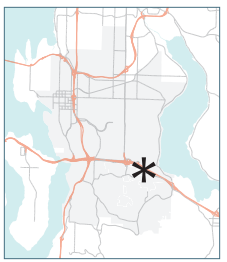
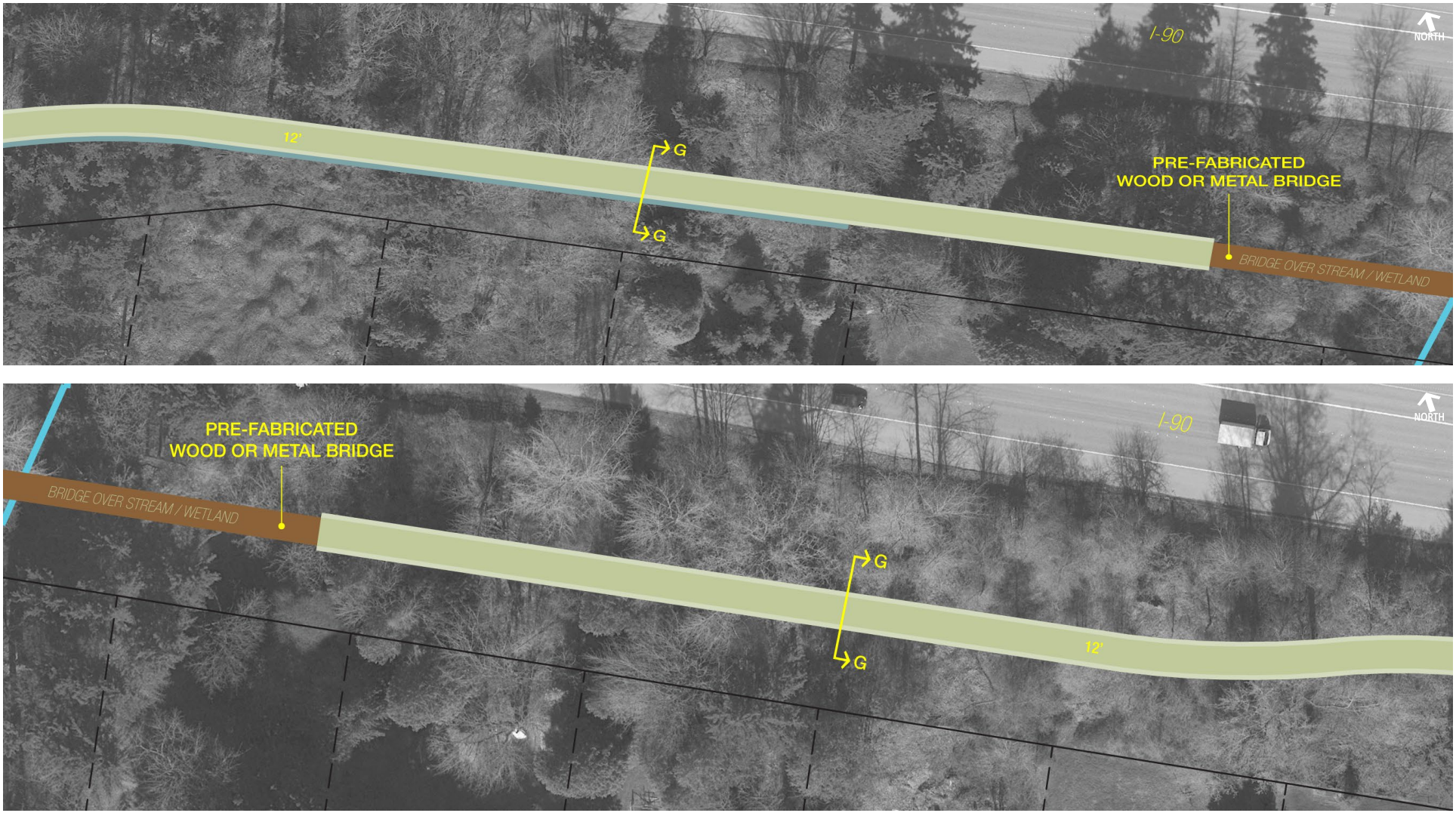


FIGURE 36 Photovisualiztion of trail in a typical natural setting.

MATCH TO FIGURE 35 ON PAGE 47



MATCH TO BELOW IMAGE

MATCH TO ABOVE IMAGE

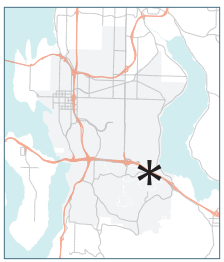
MATCH TO FIGURE 38

FIGURE 37 Trail in undeveloped WSDOT right of way east of 164th Ave SE.

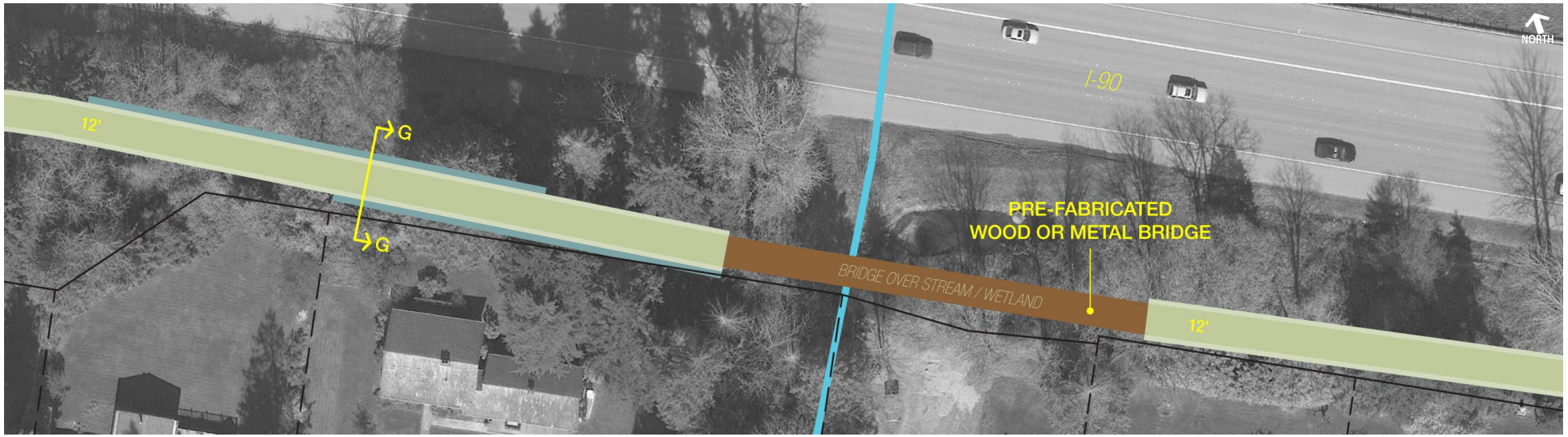
*typical sections are on page 62

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements

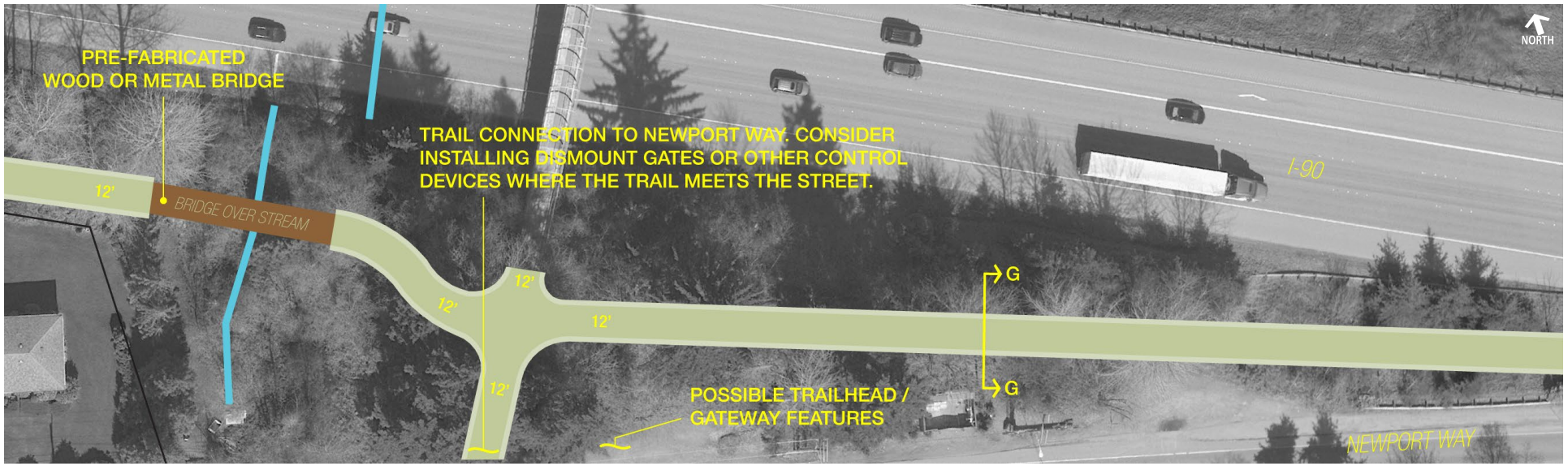


MATCH TO FIGURE 37



MATCH TO BELOW IMAGE

MATCH TO ABOVE IMAGE



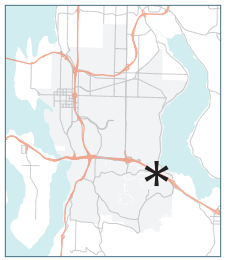
MATCH TO FIGURE 39 ON PAGE 51

FIGURE 38 Trail meets the existing pedestrian bridge over I-90 at SE Newport Way.

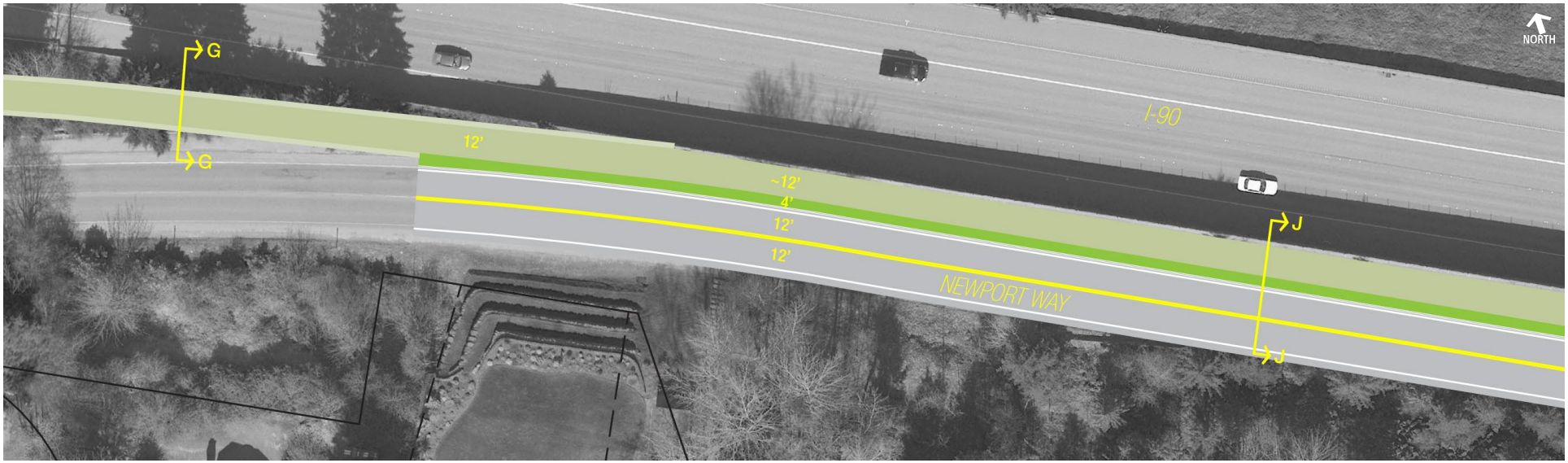
*typical sections are on page 62

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements

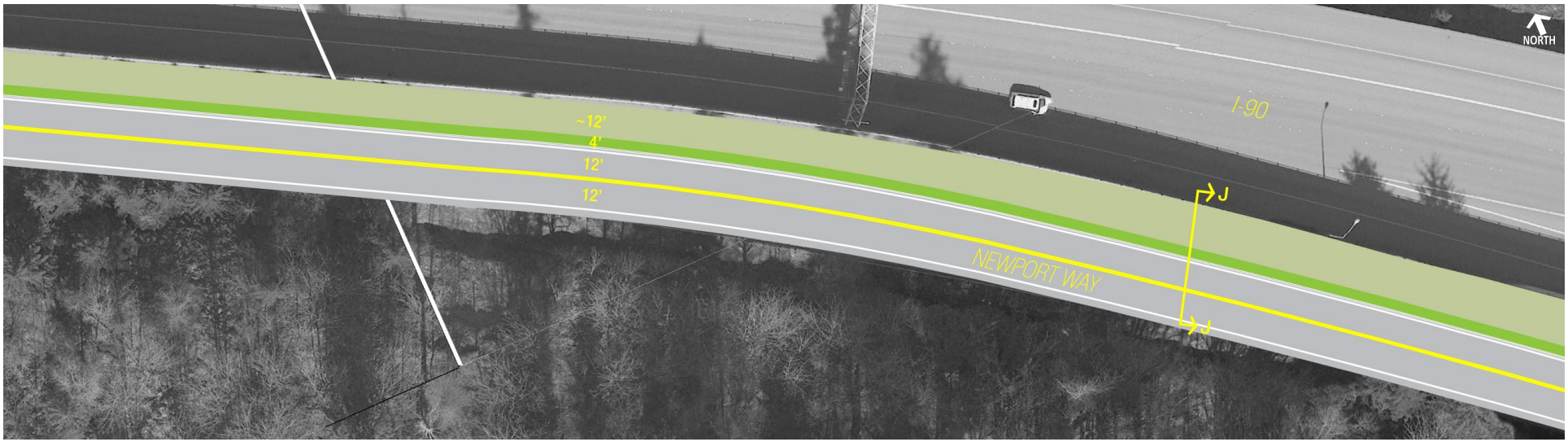


MATCH TO FIGURE 38 ON PAGE 50



MATCH TO BELOW IMAGE

MATCH TO ABOVE IMAGE



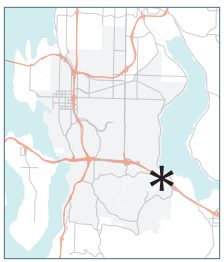
MATCH TO FIGURE 40 ON PAGE 52

FIGURE 39 Trail between the existing pedestrian bridge over I-90 at SE Newport Way and Lakemont Blvd SE.

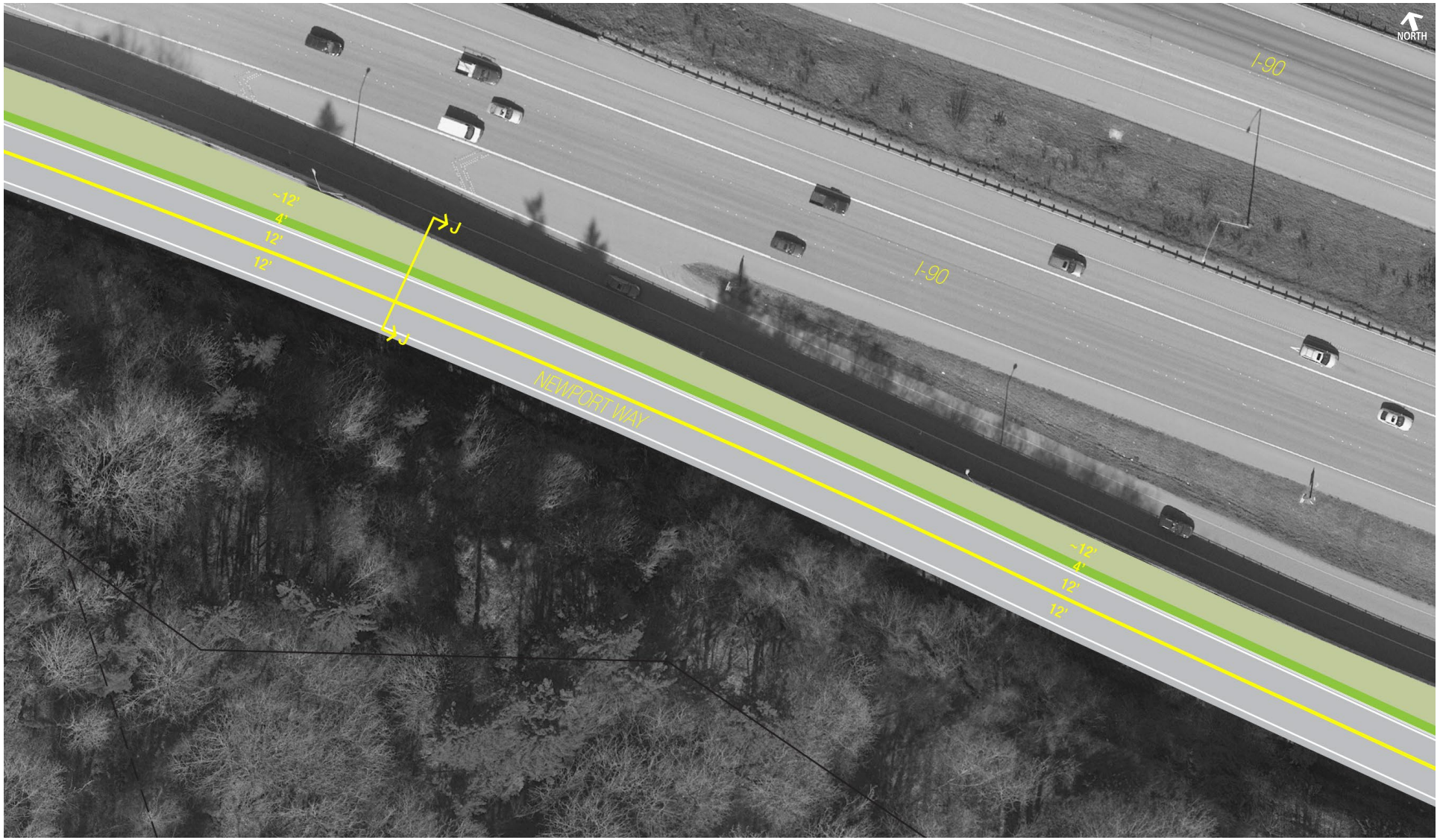
*typical sections are on page 62 and page 64

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements



MATCH TO FIGURE 39 ON PAGE 51



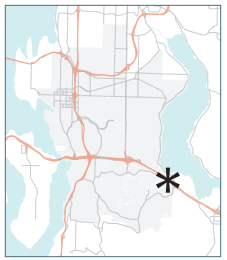
MATCH TO FIGURE 41

FIGURE 40 Trail between the existing pedestrian bridge over I-90 at SE Newport Way and Lakemont Blvd SE.

*typical sections are on page 64

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements



MATCH TO FIGURE 40

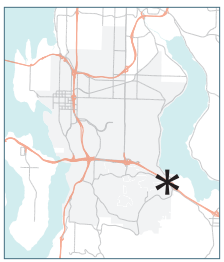
MATCH TO FIGURE 42 ON PAGE 54

FIGURE 41 Trail between the existing pedestrian bridge over I-90 at SE Newport Way and Lakemont Blvd SE.

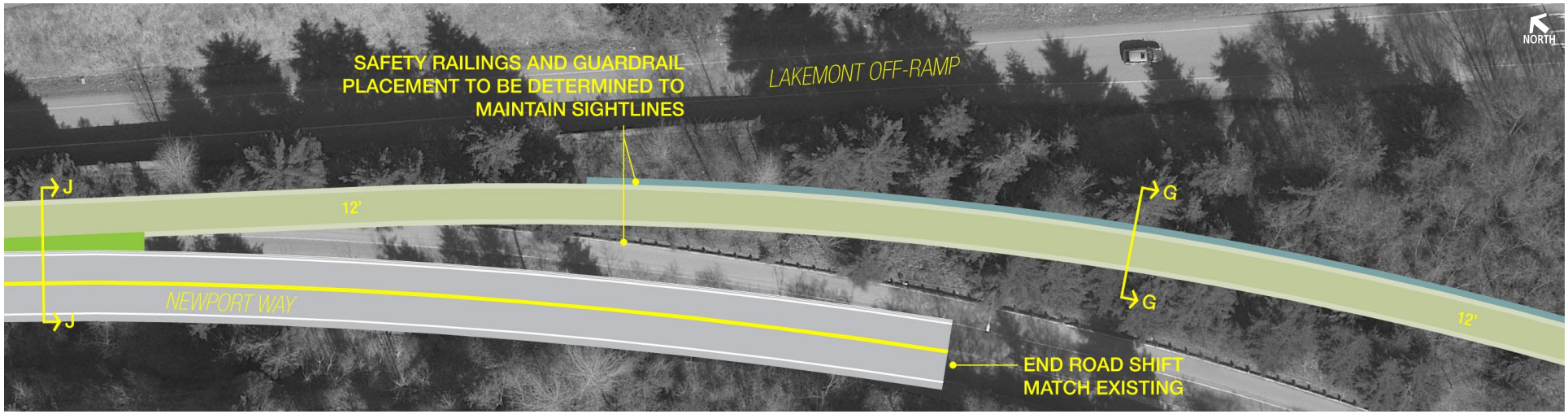
*typical sections are on page 64

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements



MATCH TO FIGURE 41 ON PAGE 53



MATCH TO BELOW IMAGE

MATCH TO ABOVE IMAGE

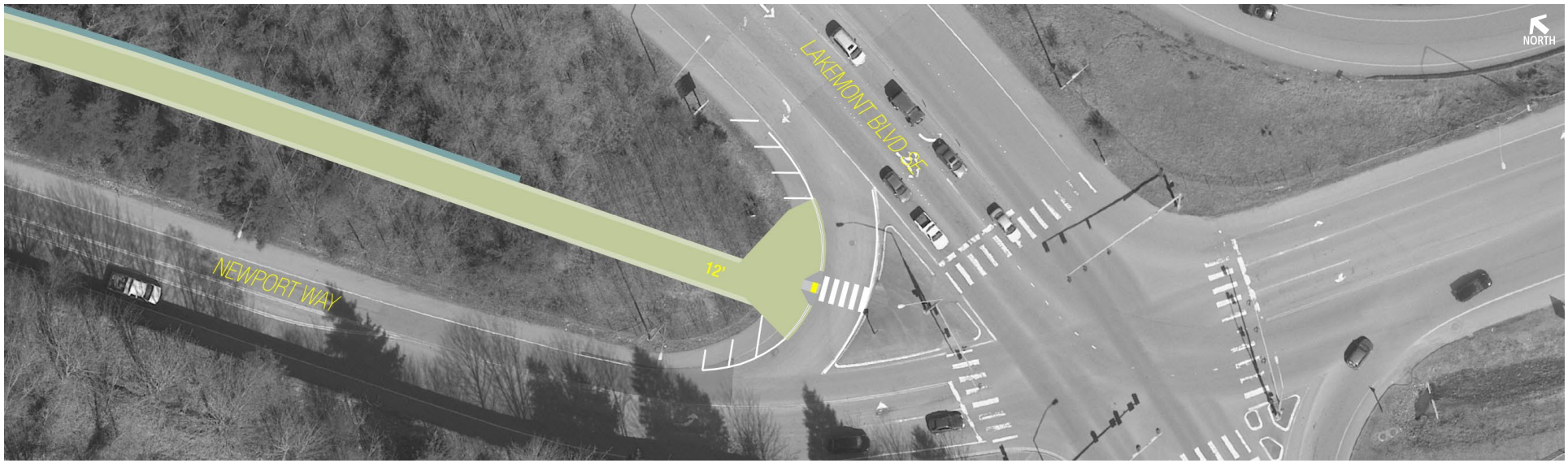
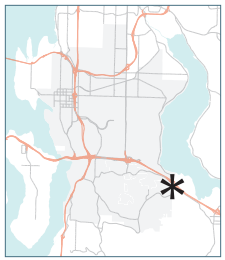


FIGURE 42 East most edge of the trail at Lakemont Blvd SE.

*typical sections are on page 62 and page 64

LEGEND

- asphalt trail
- bridge
- road
- median / planter strip
- pre-fabricated wood or metal bridge
- proposed wall
- existing wall
- stream / wetland
- right-of-way
- property line
- WSDOT 15' buffer
- B bus stop
- yellow and white lines are proposed lane and curb line improvements



PROPOSED TYPICAL TRAIL SECTIONS

The project teams agreed that given the regional importance of this multi-purpose trail, the typical trail section will be 12 foot wide with 2 foot wide buffer on each side of the trails for the entire 3.6 miles "Bellevue Gap". In the areas adjacent to SE 36th St, SE 37th St and SE Newport Way, there will be a minimum of a 4 foot planter buffer with an 18 inch cement curb and gutter between the street and trail. The trail will use pervious asphalt where feasible in areas that are not above existing or proposed walls, on top of existing utilities, or in areas where soil conditions do not permit infiltration. The typical sections are shown in Figure 43 on page 56 through Figure 52 on page 64. Trees and shrubs planted in the 4 foot minimum planter will be selected and placed to enhance the trail environment while protecting businesses ability to be seen from I-90.

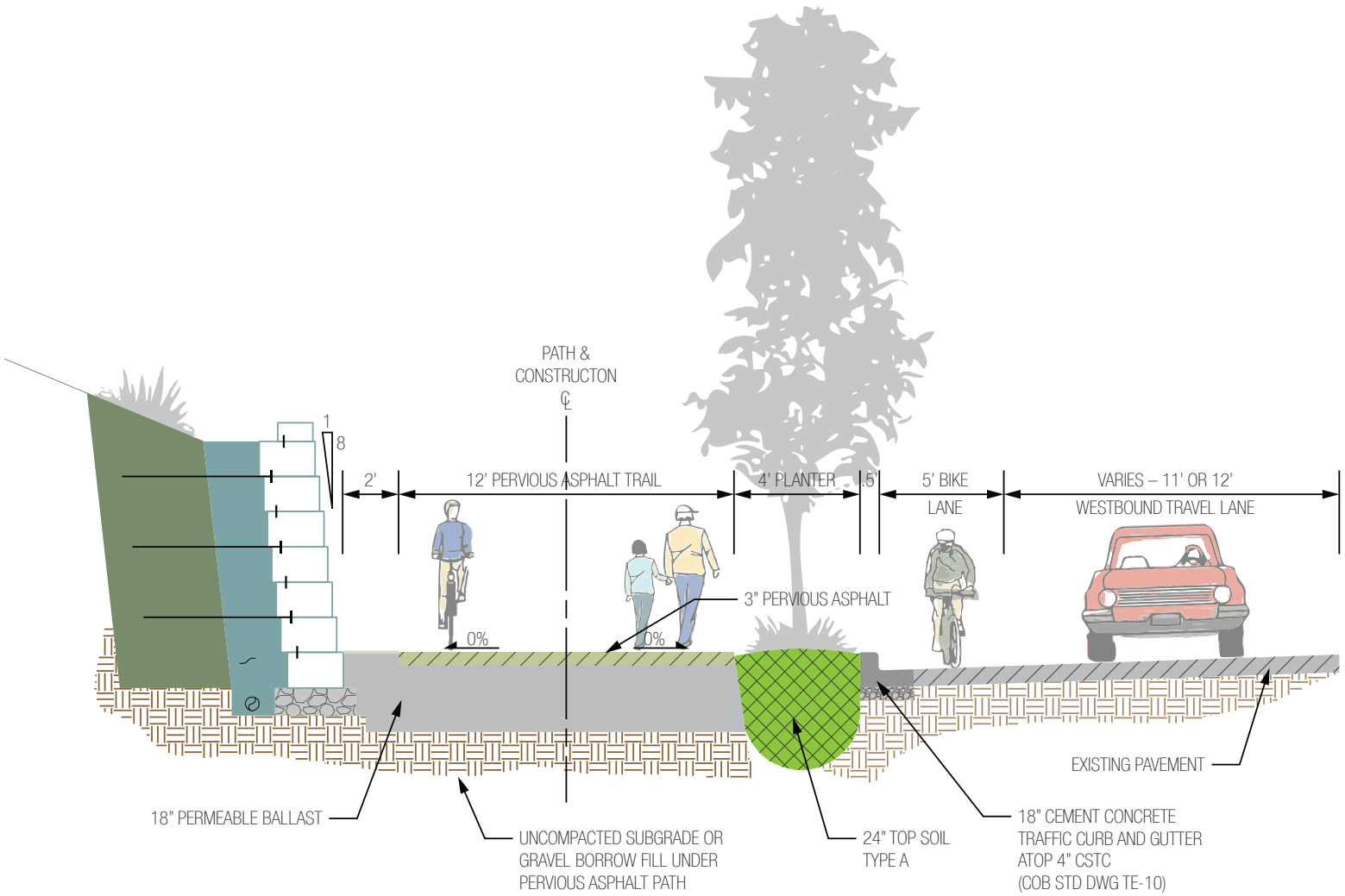


FIGURE 43 Trail section A-A (not to scale).

As referenced in: Figure 16 on page 29
Figure 18 on page 31

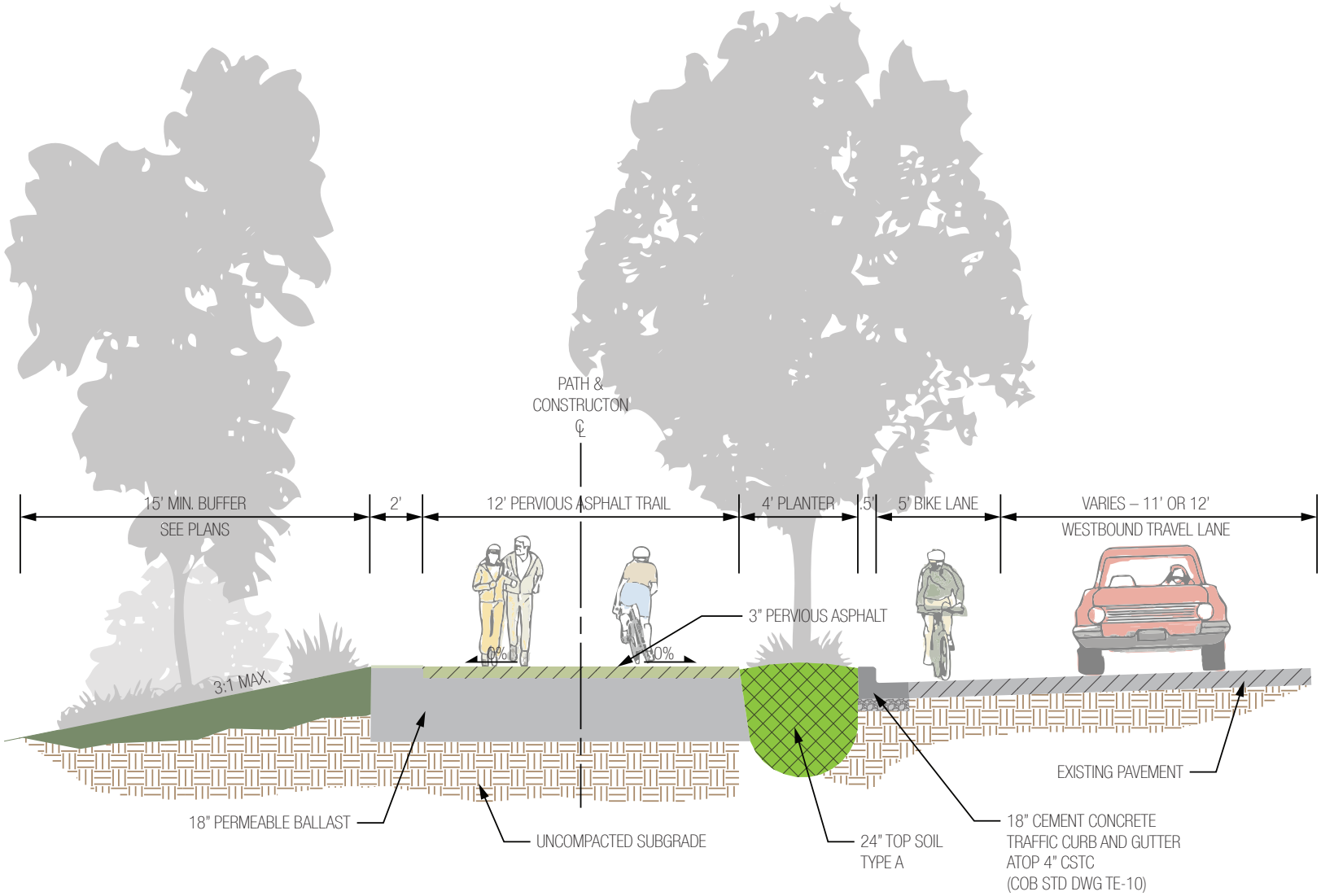


FIGURE 44 Trail section B-B (not to scale).

As referenced in: Figure 19 on page 32

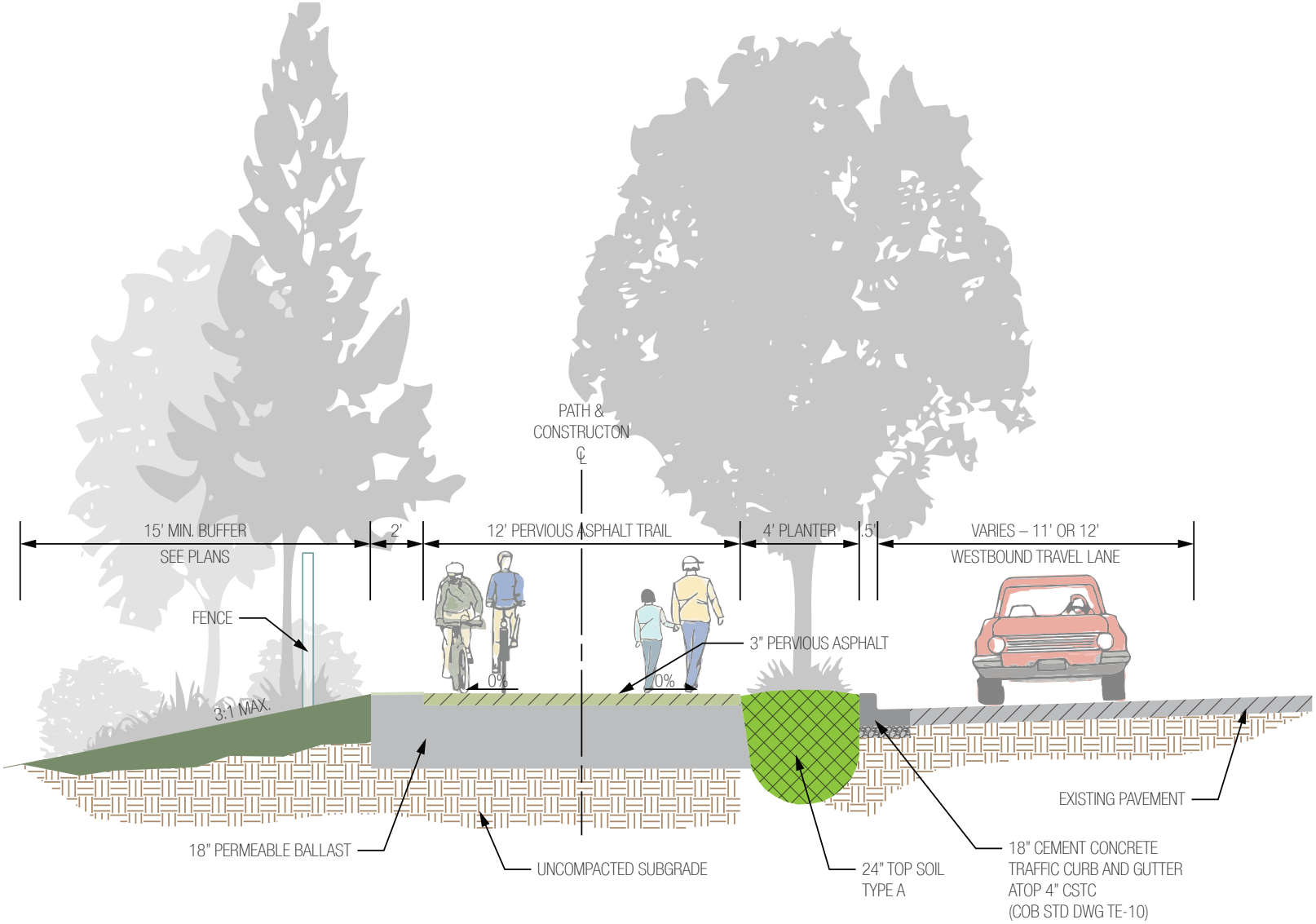


FIGURE 45 Trail section C-C (not to scale).

As referenced in: Figure 19 on page 32
Figure 25 on page 38
Figure 26 on page 39

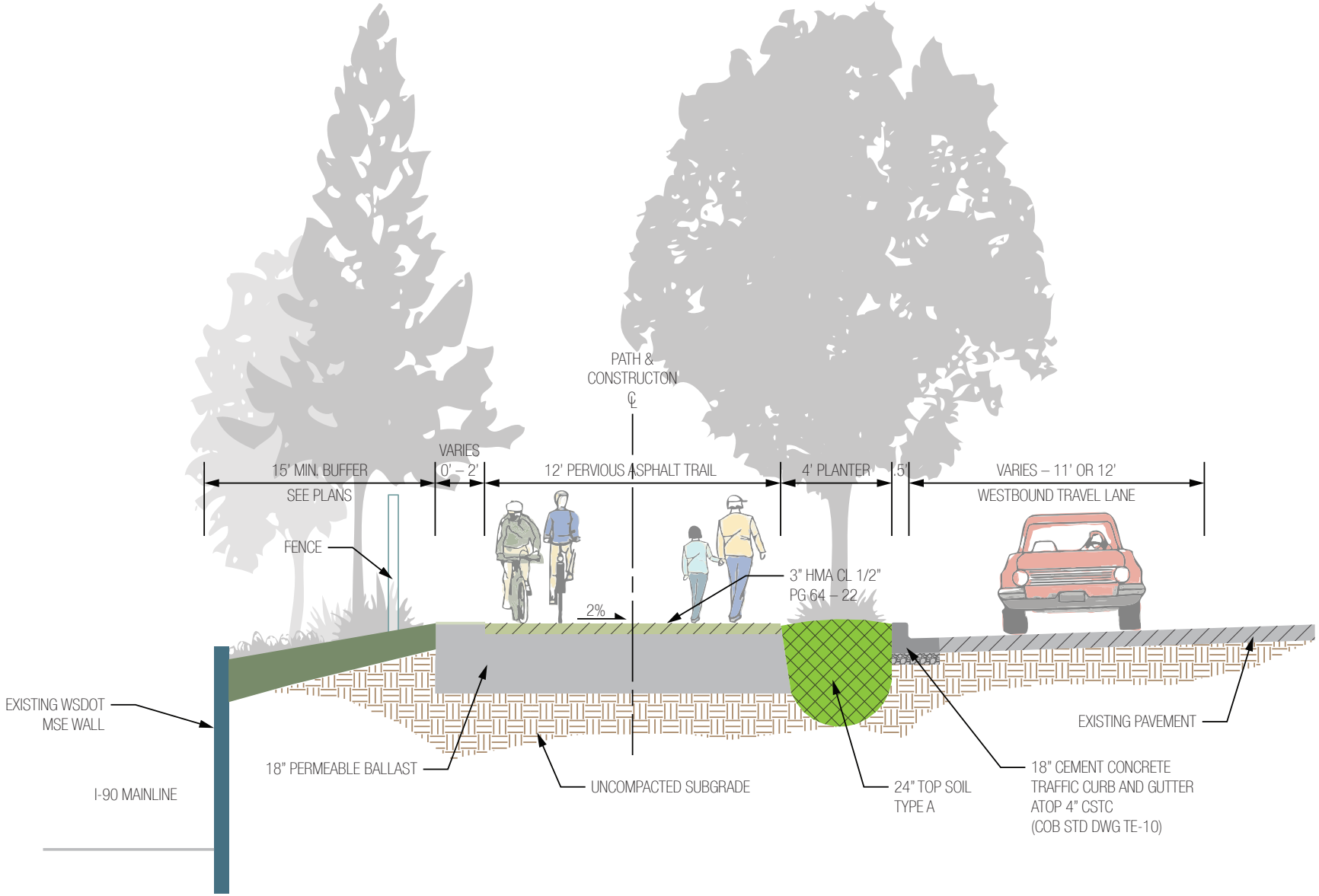


FIGURE 46 Trail section D-D (not to scale).

As referenced in: *Figure 19 on page 32*
Figure 21 on page 34
Figure 25 on page 38
Figure 26 on page 39
Figure 27 on page 40

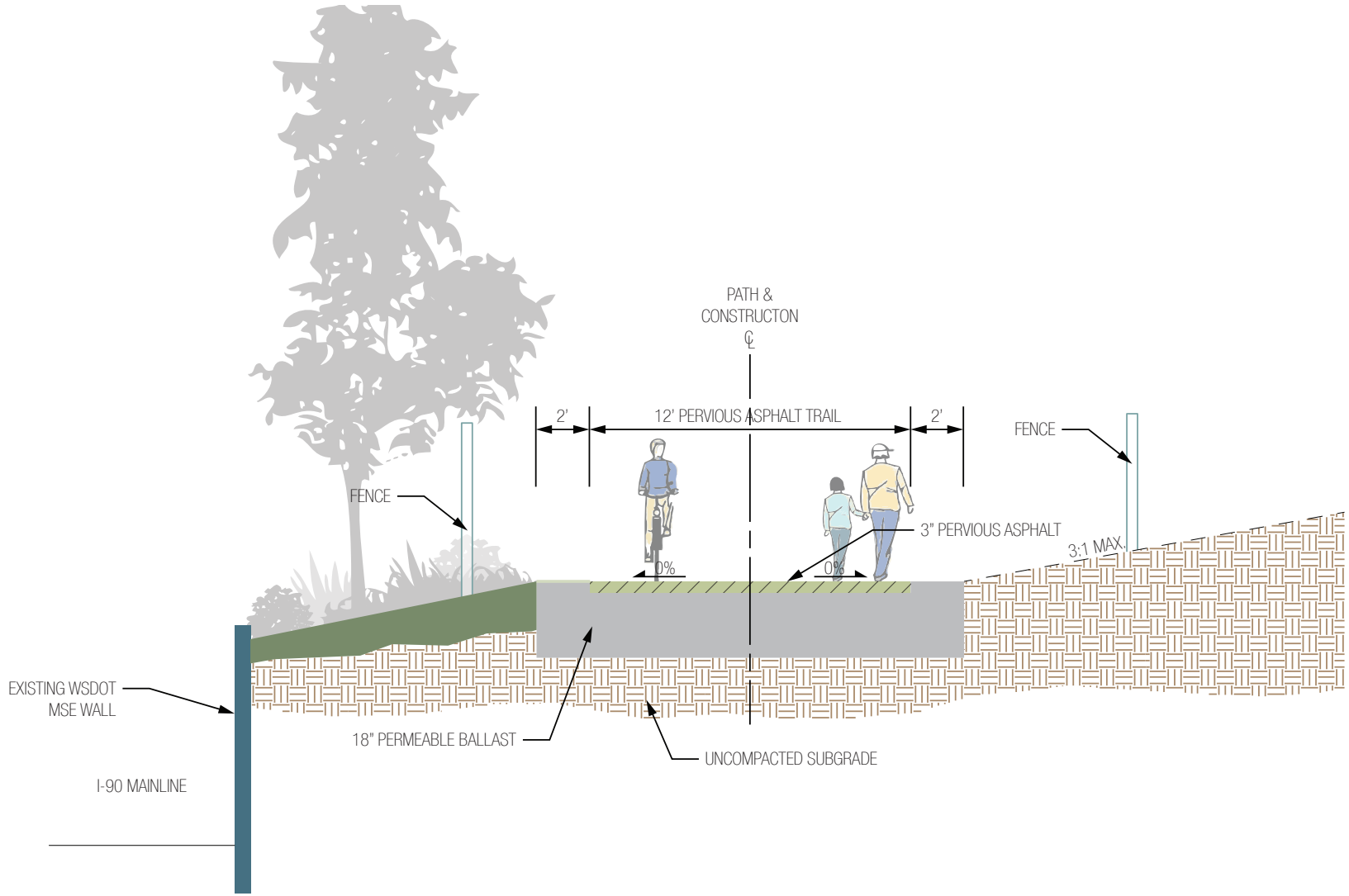


FIGURE 47 Trail section E-E (not to scale).

As referenced in: Figure 22 on page 35

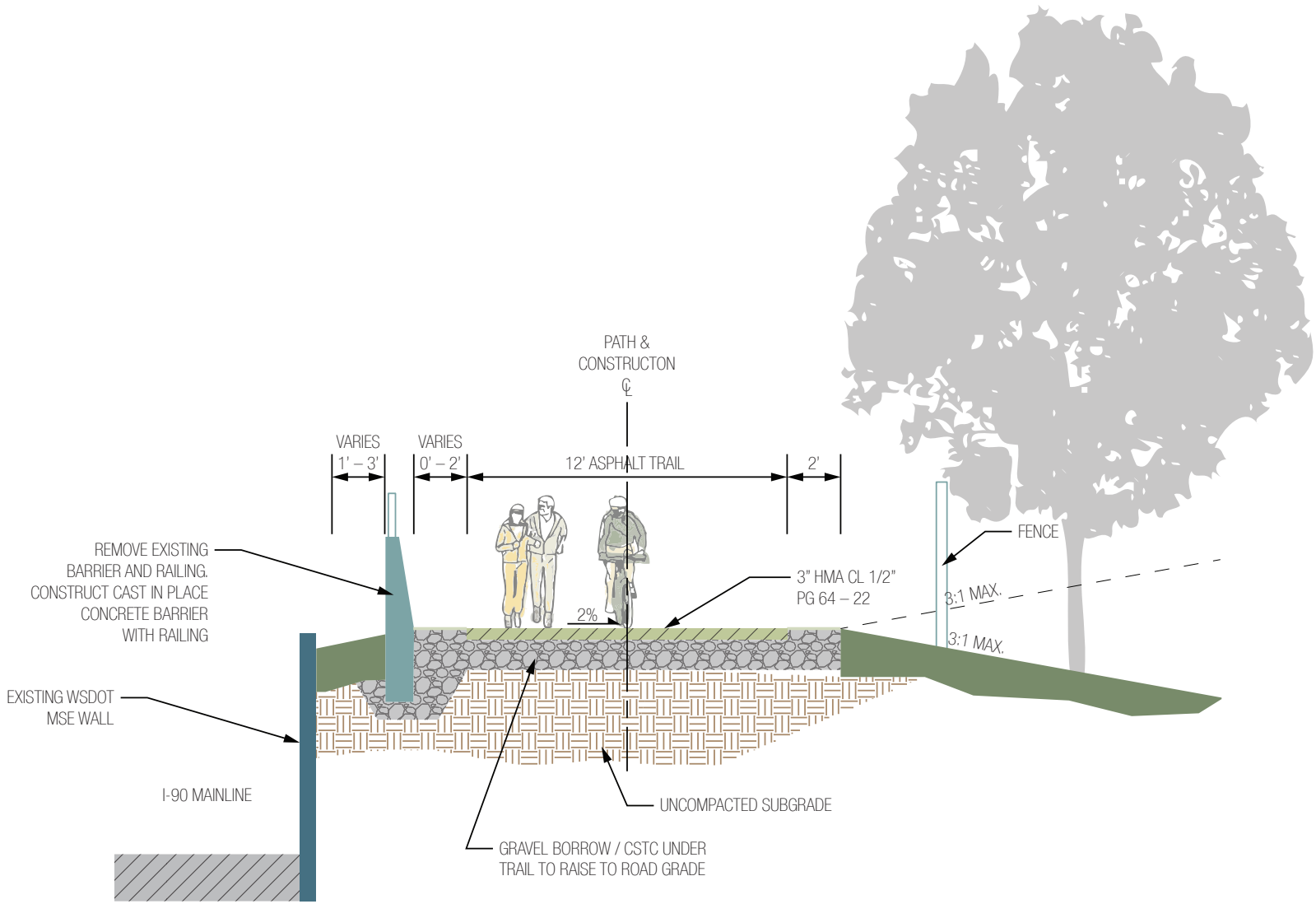


FIGURE 48 Trail section F-F (not to scale).

As referenced in: Figure 22 on page 35

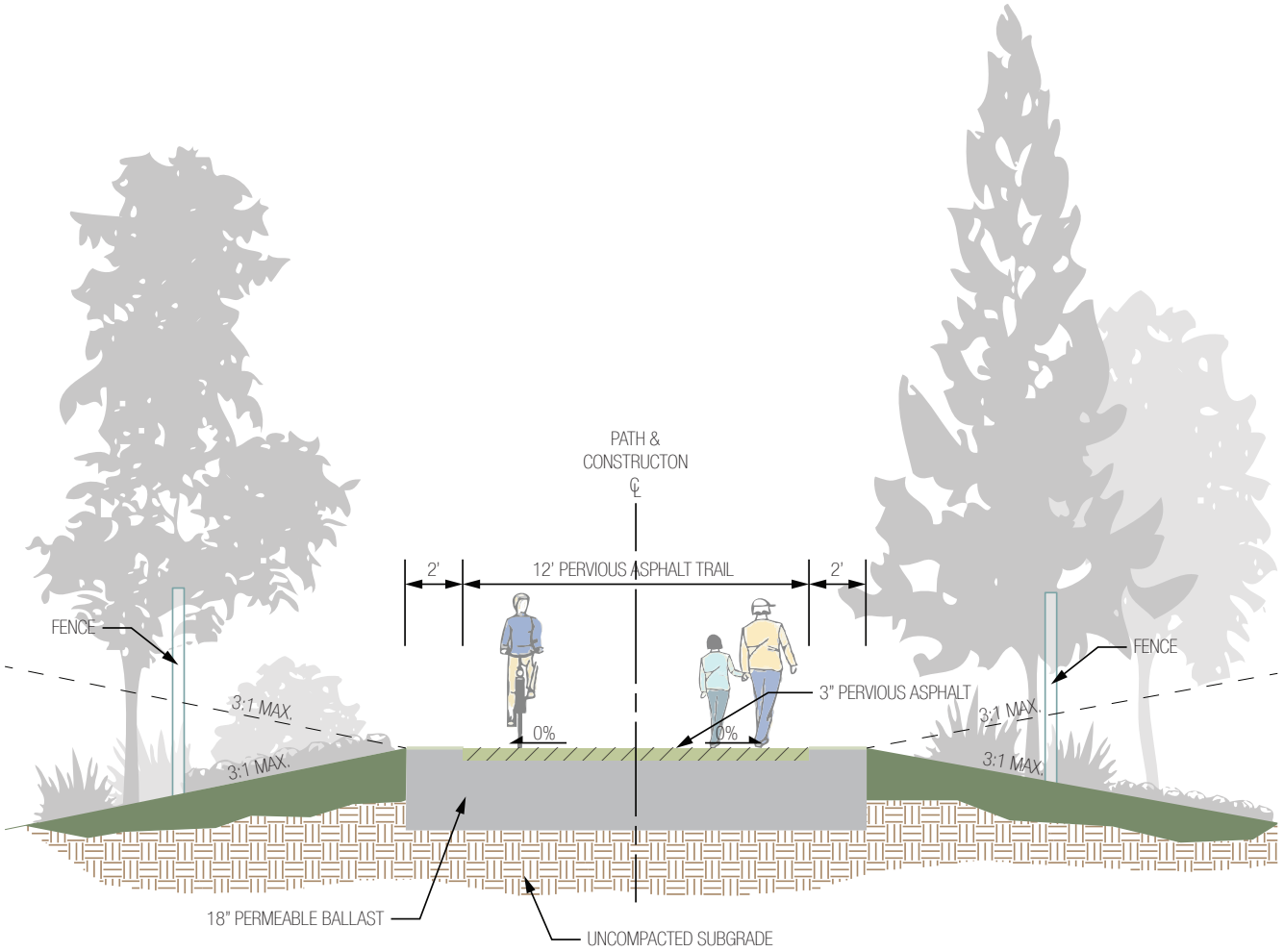


FIGURE 49 Trail section G-G (not to scale).

As referenced in: *Figure 22 on page 35*, *Figure 32 on page 44*, *Figure 33 on page 45*, *Figure 34 on page 46*, *Figure 35 on page 47*, *Figure 37 on page 49*, *Figure 38 on page 50*, *Figure 39 on page 51*, *Figure 42 on page 54*

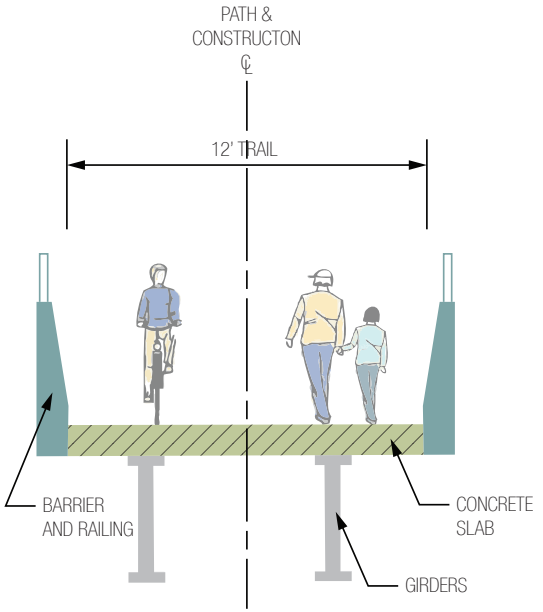


FIGURE 50 Trail section H-H (not to scale).

As referenced in: *Figure 27 on page 40*

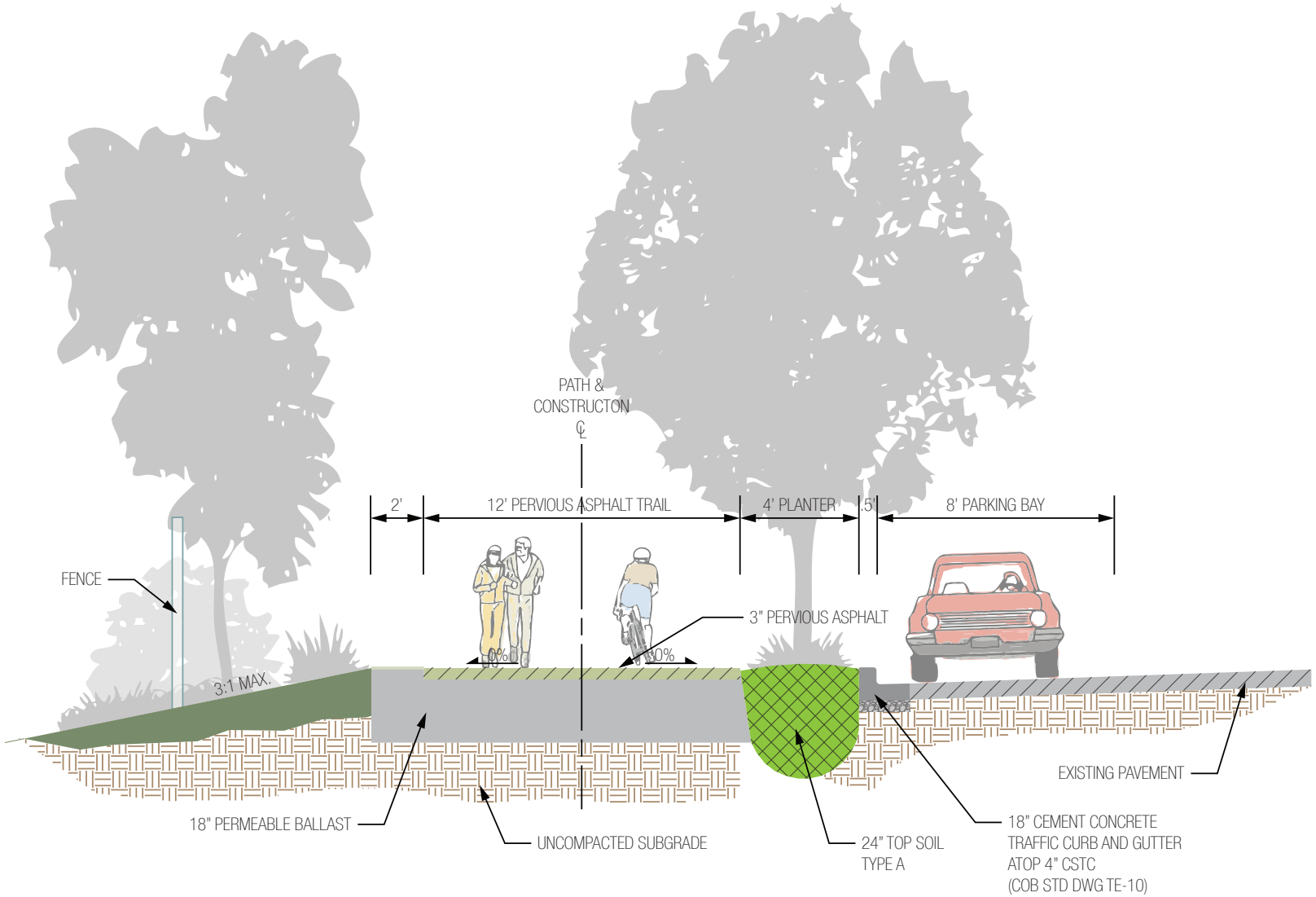


FIGURE 51 Trail section I-I (not to scale).

As referenced in: Figure 33 on page 45

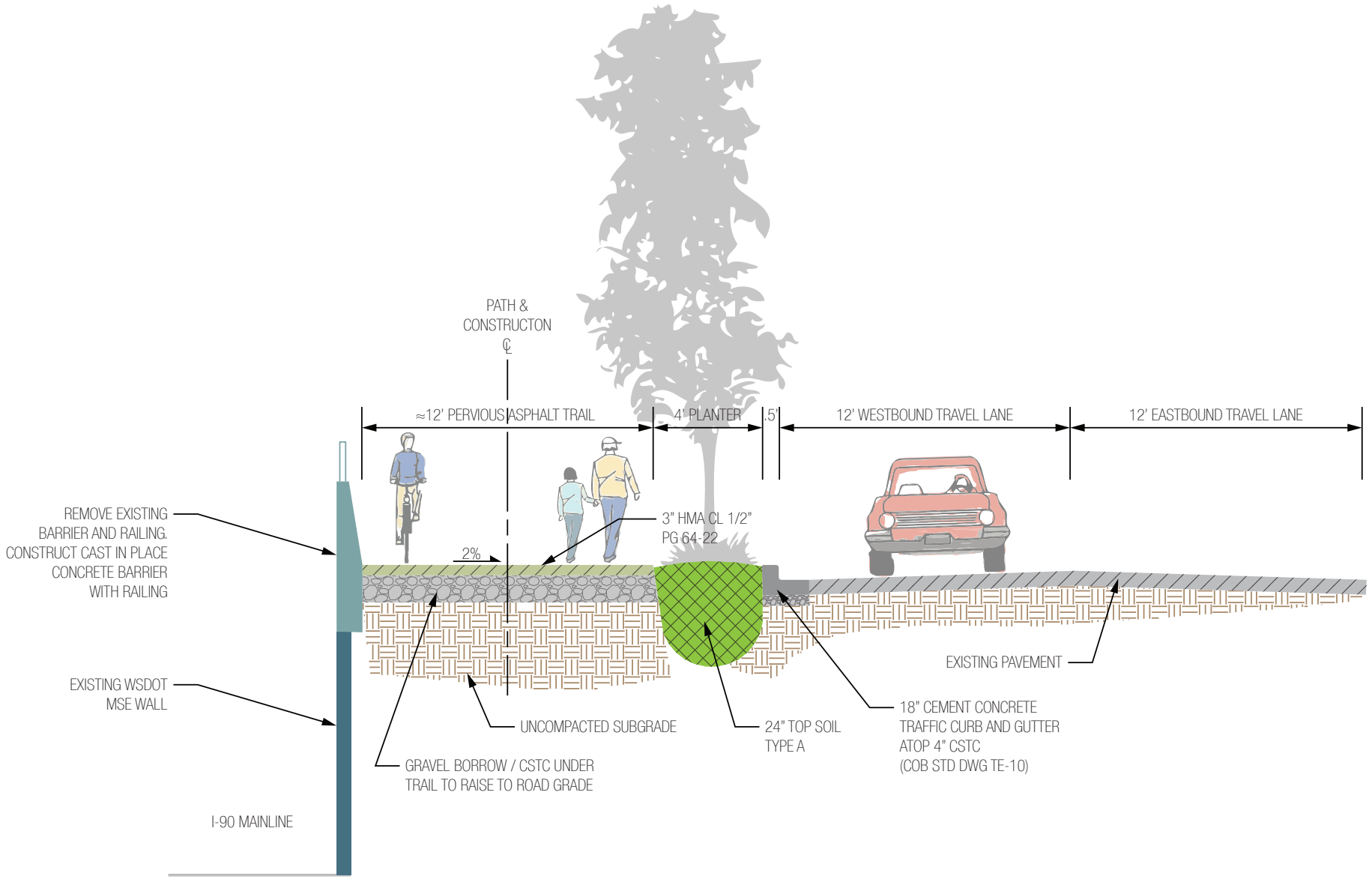


FIGURE 52 Trail section J-J (not to scale).

As referenced in: *Figure 39 on page 51*
Figure 40 on page 52
Figure 41 on page 53
Figure 42 on page 54

MID-BLOCK CROSSWALKS

There is an existing mid-block crosswalk on SE 36th St west of SE Allend Rd which could potentially be enhanced with a new flashing beacon or Rectangular Rapid Flashing Beacon system (RRFB; see Figure 27 on page 40). The widening required to construct the new 12 foot wide trail will flatten the curve on SE 36th St which will improve the sight distance. The project will install two new crosswalks: SE 36th St at Group Health (see Figure 19 on page 32 and Figure 20 on page 33) and SE 37th St at Pizza Hut (see Figure 28 on page 41). The new crosswalks will feature a median island to shorten the crossing distance, ADA Accessible ramps, and a flashing beacon system or RRFB system if warranted.

MEDIAN ISLANDS

The project will remove and replace unused asphalt on SE 36th St between Factoria Blvd SE and SE Allen Rd with planted medians. The unused asphalt is located in areas where there is no driveway access (see Figure 19 on page 32, Figure 21 on page 34, Figure 27 on page 40, and Figure 28 on page 41). The planters will be constructed with curb and gutter and will feature landscaping and irrigation systems. Trees and shrubs planted in the median will be selected and placed to enhance SE 36th St while protecting businesses ability to be seen from I-90.

RETAINING WALLS

Existing retaining walls will be preserved wherever possible. New retaining walls will be reinforced block walls – the type of block wall system will be determined during the final design. The existing Soldier Pile wall on the southside of SE 36th St west of SE Allen Rd will need to be moved and replaced in order to accommodate the new 12 foot trail on the northside of SE 36th St. Walls will also be used in the undeveloped areas of Segment 3 and 4 to limit the amount of land disturbing actives and impacts on the environment.

PREFABRICATED BRIDGES

In Segment 4, wood or metal prefabricated bridges will be installed to carry the trail over the three unnamed stream crossings. The width of the bridge will be a minimum of 12 feet and will span the stream and buffer areas (see Figure 37 on page 49 and Figure 38 on page 50).

BRIDGE OVER CROSSINGS AT FACTORIA BLVD SE AND 150TH AVE SE

In Segment 6 and 7, standard WSDOT concrete girder bridges will be constructed to carry trail traffic over the I-90 off-ramp at Factoria Blvd, over Factoria Blvd, over 150th Ave SE at SE 37th St and over the I-90 off-ramp at SE 37th St (see Figure 15 on page 28, Figure 16 on page 29, Figure 27 on page 40, and Figure 28 on page 41). The concrete bridges will be 14 feet wide. The exact placement and connection of the 150th Ave SE flyover bridge will be determined during the final design

BRIDGE UNDER CROSSING AT 142ND PL SE

In Segment 1, the trail will cross under the existing 142nd Pl SE bridge (see Figure 22 on page 35, Figure 23 on page 36, and Figure 24 on page 37). It appears that the trail can pass beneath the 142nd Pl SE bridge and maintain acceptable grades and clearances. This will allow the trail to avoid the intersection of 142nd Pl SE and SE 36th St. A more detailed review of the layout will be conducted during the final design.

DRAINAGE DESIGN

There is very little existing stormwater infrastructure within the project footprint. New conveyance systems will need to be constructed in areas adjacent to public streets. The drainage design will need to a take a "total project" approach rather than a segment by segment approach. The trail project will generate a significant amount of new and disturbed impervious

areas. There will be very little or possibly a reduction in pollution generating surfaces. Natural drainage practices, such as pervious asphalt and rain gardens, may be used depending on soil conditions and proximity to structures like walls and bridges. The undeveloped WSDOT right of way may provide opportunities to construct detention ponds to mitigate for other areas in the project.

LIGHTING AND SIGNAL MODIFICATIONS

SE 36th St will need to be adjusted to accommodate the new trail and 15 feet buffer from I-90 between Factoria Blvd SE and 136th Pl SE. This adjustment will require signal poles on the northside of SE 36th St at the intersections of 132 Ave SE and 136th Pl SE to be moved (see Figure 16 on page 29 and Figure 21 on page 34). The intersection of 150th Ave SE and SE 37th St will be partially reconstructed to accommodate a new pedestrian crosswalk on the southside (see Figure 27 on page 40). Existing street lighting that is in conflict with the proposed trail will either be relocated or replaced.

05
DESIGN ELEMENTS

DESIGN ELEMENTS

Design elements for the Greenway Trail may include the following: way-finding signs, trailhead treatments, various lighting options, visually pleasing wall systems, planted medians and buffers, mid-block crossings, pedestrian bridges, natural drainage options, and trail furniture. Each of the elements described present an opportunity to establish a sense of place on the Bellevue piece of the Mountains to Sound Greenway Trail.

WAY-FINDING AND SIGNAGE

Providing a legible, visually consistent set of way-finding techniques both on and off the trail allows trail users to navigate the trail confidently. Signs indicating how to access the trail, distances to prominent destinations, gateway features, connections to other local trails, connections to regional trails, and proper trail etiquette are all essential parts of the trail's development.

The City and other local and agencies should work together to establish consistent signing standards for regional trails. Locally, the trail will function as an important east-west route for pedestrians and cyclists in Bellevue and will connect to several existing facilities. These facilities include the Factoria Trail Connection at Factoria Blvd SE, the flyover pedestrian bridge to the north of SE 36th St at 150th Ave SE, and the pedestrian bridge over I-90 at SE Newport Way (see Figure 53). Direction signs will also help users find destinations along the trail – such as bus stops or the trail connections at 161st Ave SE and 164th Ave SE – or near the trail – such as Bellevue College and the Eastgate Park & Ride (see Figure 54).

Factoria Trail Connection at Factoria Blvd SE

FIGURE 53 Existing pedestrian and bicycle facilities which will be connected to the trail.

Flyover Bridge at 150th Ave SE and SE 36th St

Pedestrian Bridge over I-90 at SE Newport Way

Regionally, the trail completes an important gap in the Mountains to Sound Greenway trail network. As such, the trail offers an opportunity to teach users about the role of the Mountains to Sound Greenway Trust in their community through interpretive signs or displays (see Figure 55). Trail markers will continue to use the Greenway logo to strengthen the regional identity and function of the trail in Bellevue (see Figure 56 on page 74). The logo may also be incorporated in other wayfiniding schemes provided the design is consistently used throughout the trail. Examples include medallions placed in the sidewalk and public art installations (see Figure 57 on page 74).

Open house attendees also expressed a desire for signs which indicate the trail is intended for pedestrians and cyclists and markings to clearly separate the two. A centerline or dashed centerline – like the Factoria Trail Connection – could increase predictability of movement and help maintain a two-way traffic environment (see Figure 58 on page 75). Special signs may also be used to encourage cyclists to occupy a specific portion of the trail or to slow and signal their presence (see Figure 59 on page 75 and Figure 60 on page 75).

FIGURE 54 Examples of way-finding signs. A street sign directs pedestrians and cyclists to the Mountains to Sound Greenway Trail (left). Cyclists are directed to the I-90 trail or Lake Washington Loop Trail (center left). A trail marker at 150th Ave SE and SE 28th St in Bellevue directs trail users to Bellevue College (center right). The Scott Pierson Trail in Tacoma, WA directs trail users to nearby amenities (right).

FIGURE 55 The Orland Urban Trail uses interpretive displays to explain the history of the Dinky Line to trail users (left). A trail through Log Boom Park has a series of displays about the history of Kenmore, WA (right). Similar displays in Bellevue could explain the Mountains to Sound Greenway Trust and Trail system.

FIGURE 56 The Mountains to Sound Greenway logo (left) and signs incorporating the logo (center and right).

FIGURE 57 Barbary Coast Trail medallions are placed in the sidewalk in San Francisco, CA to help trail users find their way (left). Trail signs for Three Rivers Park in Pittsburg, PA (right).

FIGURE 58 Lanes are marked with a yellow dashed center line on the Luce Line in Hennepin County, MN.

FIGURE 59 A sign directing cyclists and pedestrians where to occupy space on the trail.

FIGURE 60 Signs can encourage cyclists to notify others of their presence.

TRAILHEAD TREATMENTS

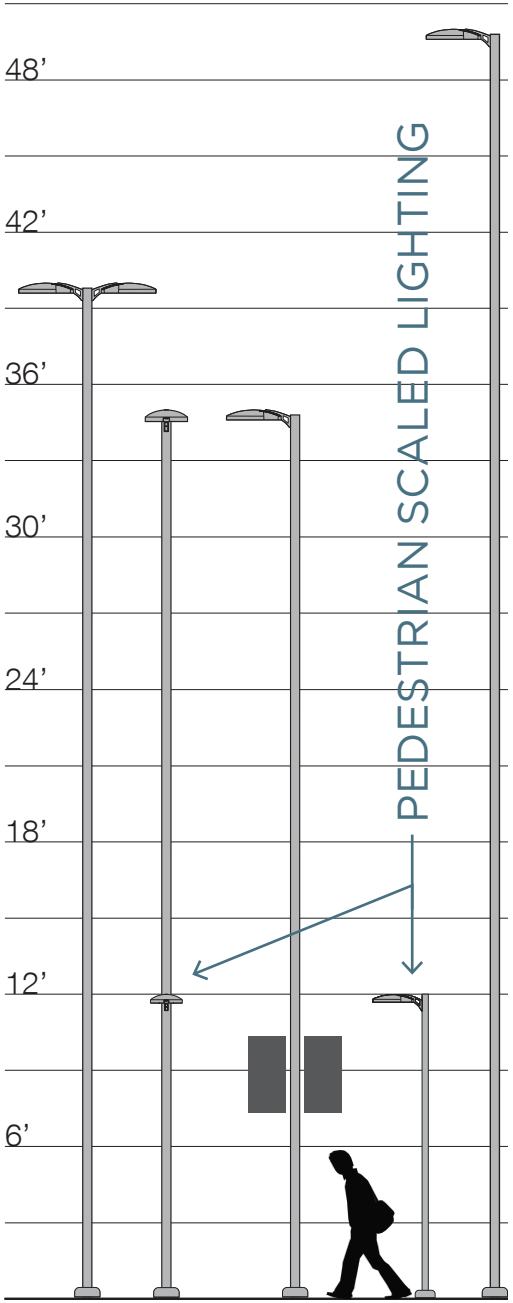
Some trailheads – such as those at 161st Ave SE, 164th Ave SE, and SE Newport Way – may require special treatment so that trail users do not "suddenly" appear at street connection. Dismount gates would minimize abrupt entry of trail users into street crossing and prevent unauthorized use (see Figure 61). The turns required by dismount gates should be wide enough to allow appropriate trail access for wheelchairs and child bike trailers (see Figure 62). Any gates that extend across the track of the trail should also be easy to see, especially in low-light conditions. Bollards are another trailhead treatment option which are easier to maneuver than dismount gates but still prevent unauthorized trail use (see Figure 63).

FIGURE 61 A dismount gate at trailheads with a highly visible sign encourages cyclists to walk their bike on and off the trail.

FIGURE 62 A cyclist is forced to dismount and unhitch her child trailer to maneuver through a dismoutn gate.

FIGURE 63 Bollards prevent unauthorized trail use but are easier to maneuver than dismount gates

FIGURE 64 Height comparison of pedestrian scaled lighting and auto-oriented lighting.



TRAIL LIGHTING

Light posts and fixtures that are pedestrian friendly (shorter and more in scale with pedestrians and with less obtrusive and harsh light sources; see Figure 64 and Figure 65) are important way-finding and safety enhancements of the trail, particularly around conflict points and connections with other trails. Although lighting will serve different functions throughout the length of the trail, aesthetically identical light fixtures spaced at regular intervals will provide consistency along the corridor.

The right level of lighting is critical to ensuring that the trail is used and used safely. Where existing street lighting will provide enough illumination to meet safety requirements, the pedestrian lights may be lower power and used primarily for decorative purposes. Other areas, however, such as the undeveloped WSDOT right of way in Segment 4, will require the trail lighting to serve as the primary light source (performing all of the security, wayfinding, and decorative functions).

LED and/or solor powered lighting will be employed because of their low impact on the environment (see Figure 66).

FIGURE 65 Examples of pedestrian scaled lighting.

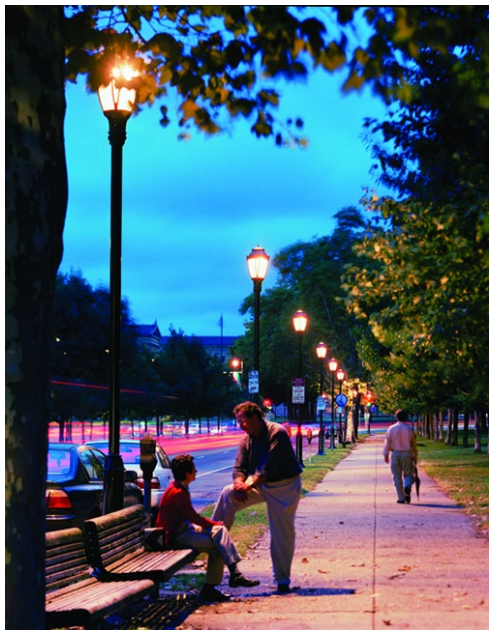
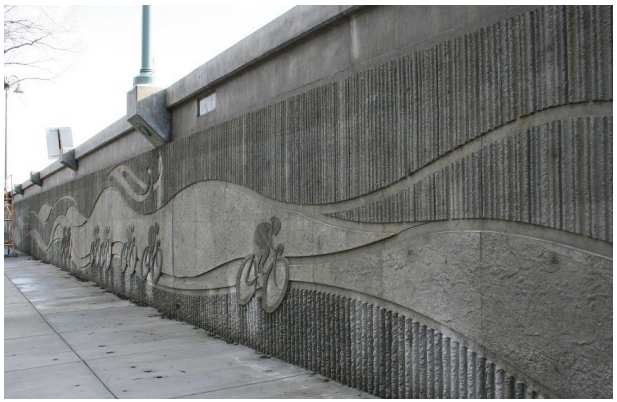


FIGURE 66 Examples of LED and solar powered trail lighting.

BARRIERS AND RAILINGS

The elevated bridge crossing, the close proximity of the trail to I-90, and the natural setting in undeveloped areas of Segments 3 and 4 will necessitate the use of barriers and railings on the trail. Examples included here are intended to show a range of design aesthetics appropriate for the trail (see Figure 67 and Figure 68).

FIGURE 67 Examples of walls with engraved designs.



Redding, CA

Issaquah, WA

Denver, CO

Shoreline, WA

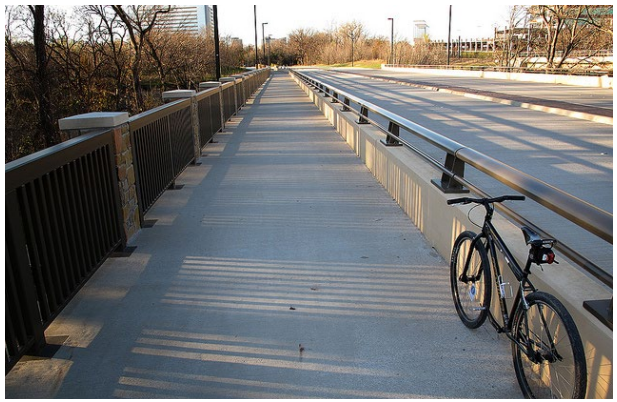
Stuart, FL

Tacoma, WA

FIGURE 68 Examples of railings and low barriers.

Shoreline, WA

Minneapolis, MN



Richardson, TX

Richardson, TX

Washington, DC

Bellevue, WA

St. Louis Park, MN

Seattle, WA

Shoreline, WA

BRIDGE CROSSINGS

Three types of bridges will be constructed throughout the length of the trail. Segments 6 and 7 are standard WSDOT concrete girder bridges which carry trail traffic over the I-90 off-ramp at Factoria Blvd SE, over Factoria Blvd SE, over 150th Ave SE at SE 37th St, and over the I-90 off-ramp at SE 37th St. These elevated portions of the trail will help provided direct links over busy intersections with limited availability of alternative crossings for pedestrians and cyclists. The bridges will also function as visual icons to the high volume of traffic travelling through the intersections (see Figure 69). The figures and drawings of the 150th Ave SE bridge show one possible placement and connection to the existing north-south flyover bridge; exact placement and integration will be determined in the final design phase.

The bridge crossing under 142nd Pl SE will look very similar to other segments of the at-grade trail with appropriate barriers and railings to keep trail users separated from I-90 to the north (see Figure 70 on page 84).

Prefabricated wood or metal bridges will also be installed to carry the trail over the three unnamed stream crossings in Segment 4. Given the wet nature of the climate, asphalt decking will be employed to reduce the possibility of a slick, and thus unsafe, surface (see Figure 71 on page 85).

Peachtree Dunwoody (Atlanta, GA)

FIGURE 69 Examples of elevated pedestrian bridges.

Pinellas Trail (St. Petersburg, FL)

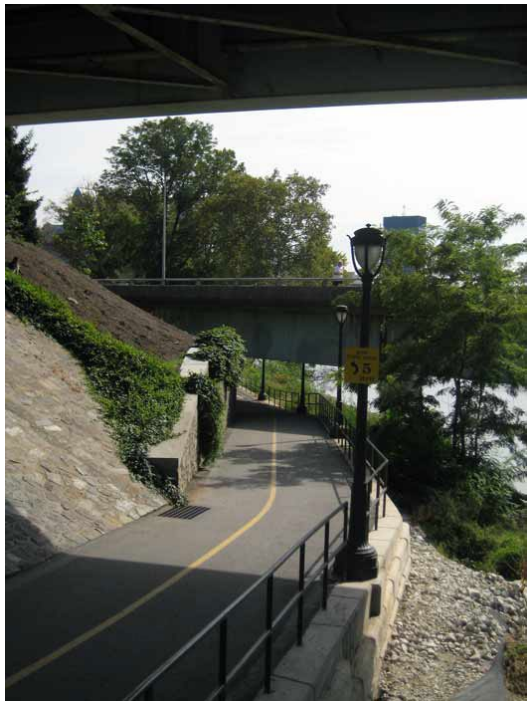
Rock Creek Park Trail (Washington, DC)

FIGURE 70 Examples of trail undercrossings.

Stevens Creek Trail (Santa Clara County, CA)

Stevens Creek Trail (Santa Clara County, CA)

Jose Rizal Bridge (Seattle, WA)



Schuylkill River Trail (PA)

Tiger Mountain Trail (WA)

FIGURE 71 Examples of prefabricated wood and metal bridges with asphalt or concrete decking.

Maple Leaf Reach (WA)

Coventry Park (MO)

MEDIANS AND PLANTER STRIPS

Planted medians and planter strips incorporated throughout the project will increase the aesthetic quality of the trail corridor, help improve environmental and public health, improve pedestrian safety and reinforce Bellevue's image as a city in the park (see Figure 72 and Figure 73). Rain gardens (see "Natural Drainage Practices") will be incorporated into landscaping designs where feasible. Entirely un-landscaped medians will not be used. Trees and shrubs located in the planter will be selected and placed to enhance the trail environment while protecting businesses ability to be seen from I-90.

FIGURE 72 Examples of planter strips.

Planter Strip (Stanmore, Australia)

Planter Strip (Bellevue, WA)

Low Planted Median (Redmond, WA)

Planted Median With Trees

Planted Median With Trees (Nora, IN)

Planted Median with Trees (NYC)

FIGURE 73 Examples of planted medians.

MID-BLOCK CROSSINGS

The two proposed crosswalks (SE 36th St at Group Health and SE 37th St at Pizza Hut) will have angled median refuge islands incorporated into the designs. Median refuge islands facilitate pedestrian and bicycle crossings and will direct the pedestrian and cyclist to look at oncoming traffic while crossing the street (see Figure 74 and Figure 75).

Flashing beacons or Rectangular Rapid Falshing Beacon (RRFB) systems may be incorporated into crosswalk designs to improve the safety of these crossings by alerting drivers to yield. RRFBs are a type of active warning beacon which use an irregular flash pattern similar to emergency flashers. Beacons can be actuated either manually by a push-button or passively through detection. The existing crosswalk at SE Allen Rd on SE 36th St could be reconstructed to include an angled median refuge island and flashing beacon or RRFB system (see Figure 27 on page 40 and Figure 76).

FIGURE 74 Examples of angled mid-block crossings with a pedestrian refuge.

FIGURE 75 Examples of mid-block crossings with median refuge islands.

Non-Angled Mid-Block Crossing with a Pedestrian Refuge

Landscaped Mid-Block Crossing with a Pedestrian Refuge Isalnd

Angled Mid-Block Crossing with a Pedestrian Refuge

FIGURE 76 Examples of solar powered RRFBs.

Miama-Dade County, FL

Interlake High School (Bellevue, WA)

NATURAL DRAINAGE PRACTICES

The goal of Bellevue's natural drainage practices is to reduce stormwater impact on Bellevue's environment and more closely mimic natural hydrologic processes. Rain gardens, bioretention areas, amended soils, vegetated roofs, cisterns, porous pavement and pavers are all storm water treatment systems that can reduce the area of impervious surfaces, the volume of storm water runoff, sediment levels, and pollutants. They can also reduce the rate of runoff, contributing to a cleaner storm water system, and further downstream, a healthier ecosystem. As previously mentioned, the use of natural drainage practices will depend on soil conditions and the proximity to structures such as walls.

The trail will use pervious asphalt where feasible in areas that are not above existing or proposed walls, on top of existing utilities, or in areas where soil conditions do not permit infiltration (see Figure 77 and Figure 78). By infiltrating most of the storm water on-site, the amount of water and pollution flowing into storm sewers and directly to rivers and streams is greatly reduced.

FIGURE 77 Pervious ashpalt on the Factoria Trail Connection (Bellevue, WA).

FIGURE 78 Pervious asphalt on the Pheasant Branch Conservancy trail (Middleton, WI).

Rain gardens are also intended to improve storm water quality, reduce runoff volumes, and generally facilitate infiltration of cleaned water. They are a planted depression that captures rainwater runoff from impervious surfaces (like roadways and parking lots) to stop the water from reaching the sewer system (see Figure 79). Landscaped areas of the project (e.g., the medians and planter strips on SE 36th St), especially those not suitable for street trees, offer opportunity to use rain gardens as an aesthetically pleasing and environmentally responsible water management solution.

FIGURE 79 Examples of rain gardens used in the 145th Pl SE Roadway Improvements Project in Bellevue, WA (top), inorporated into a planter strip in Portland, OR (bottom left) and in a parking lot (bottom right).

TRAIL FURNITURE

Trail furniture includes items placed or fixed on the trail for public use, such as benches, water fountains, trash and recycling receptacles, and bike racks. For those objects not explicitly discussed above, the design should generally enhance the natural emphasis of the trail. Continuity of material for each category of street furniture is essential for maintaining visual cohesiveness on the corridor. The objects may also provide opportunity to continue larger themes within Bellevue or to incorporate functional public art like the way-finding medallions mentioned in Figure 57 on page 74. Examples included here are intended to show the range of design aesthetics available for the trail system (Figure 80 and Figure 81).

FIGURE 80 Variations in park bench styles and recycled or natural material options.

Material: recycled Nokia Phones

Material: Oak

Materials: Wood and Metal

Material: Recycled Plastic

FIGURE 81 Water fountains,bike racks and other furniture can be functional art pieces on the trail.

06

ENVIRONMENTAL CONSIDERATIONS & AGENCY PERMITTING REQUIREMENTS

ENVIRONMENTAL CONSIDERATIONS & AGENCY PERMITTING REQUIREMENTS

ENVIRONMENTAL CONSIDERATIONS

The following potentially environmentally sensitive and critical areas are outlined briefly below: steep slopes, stream crossings, shorelines, wetlands, flood zone hazards, and geologic hazard areas.

SLOPES

- A steep slope is located in the area of the soldier pile wall replacement on SE 36th St within Segment 2 (see Figure 82).
- Some steep slopes are located within undeveloped areas between SE 37 St and SE Newport Way within Segment 3 and Segment 4.

STREAMS

- The trail crosses over Richards Creek and Sunset Creek, which are both contained within an existing culverts the creeks cross the trail in Segment 1.These are both classified as Type F fish bearing streams. There would be no buffer requirements in these areas since the streams are contained in culverts.
- The trail crosses over Vasa Creek, which contained within an existing culvert at the trail crossing in Segment 3. This is a non-fish bearing segment of Vasa Creek.
- The trail will cross 3 Unnamed Tributaries within Segment 4. All three tributaries are classified as Type F fish bearing streams and would have a critical areas buffer of 50 feet (see Figure 83).

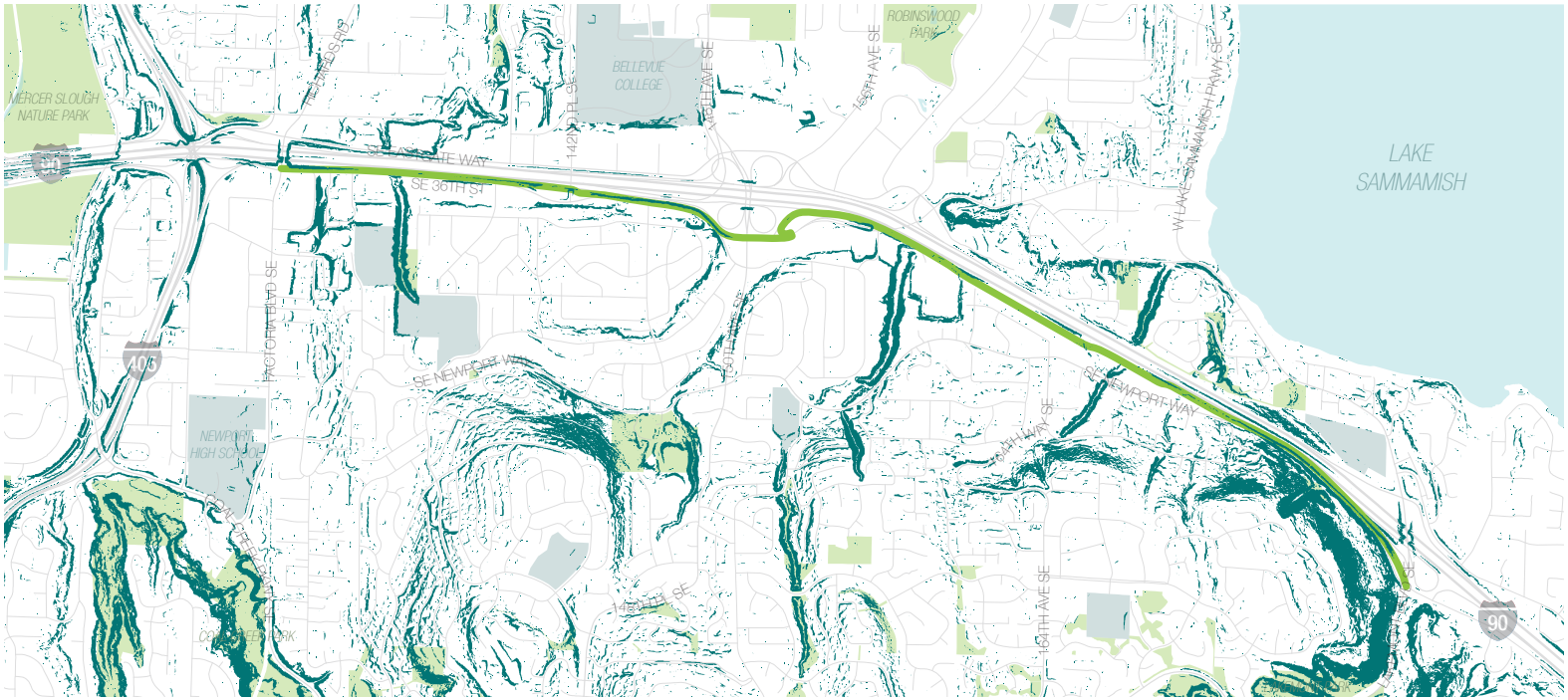


FIGURE 82 Steep slopes near the preferred alignment of the trail.

LEGEND

- trail
- steep slope

NORTH

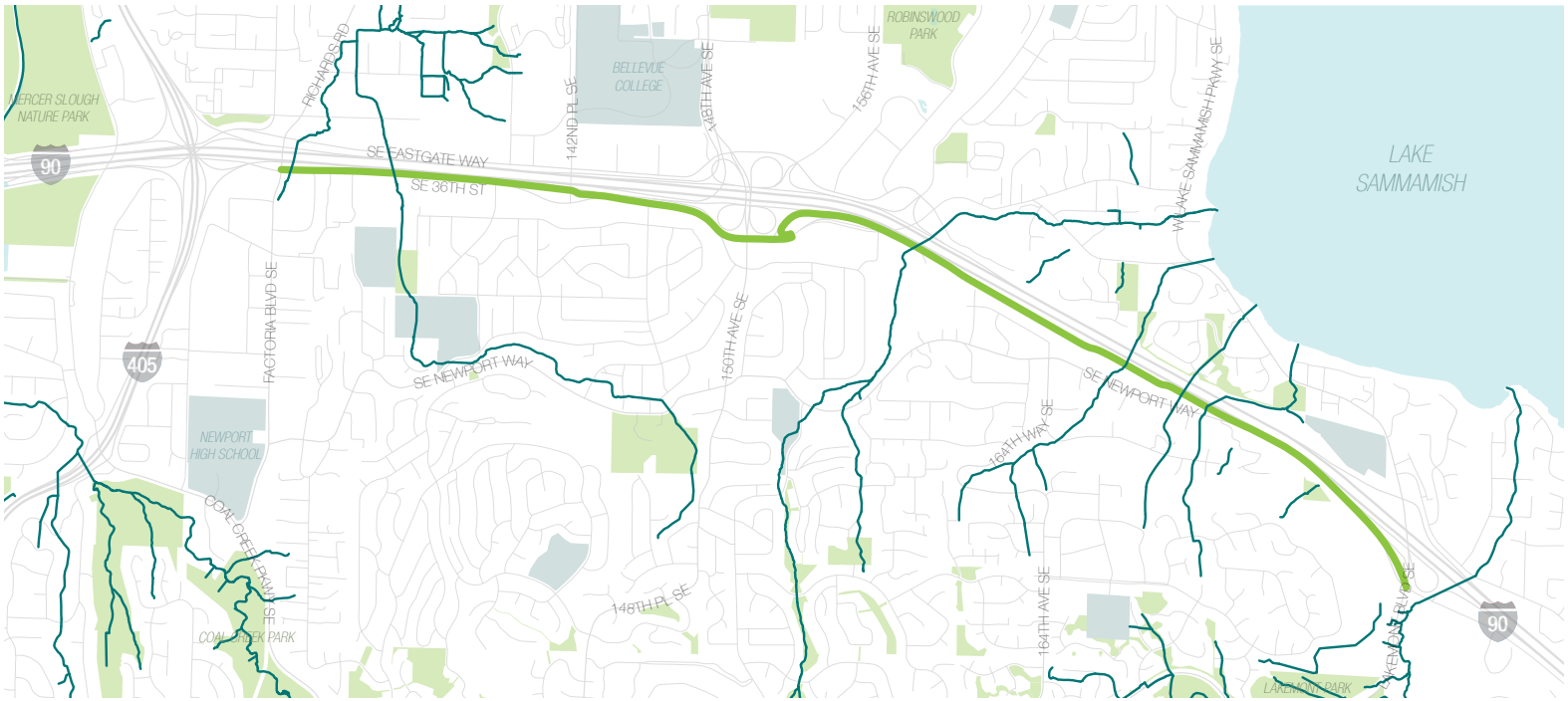


FIGURE 83 Streams crossed by the preferred alignment of the trail.

LEGEND

- trail
- existing stream

NORTH

SHORELINES

- Richards Creek, Sunset Creek, Vasa Creek and the three unnamed Tributaries are not designated as shoreline critical areas.

WETLANDS

- According to the City of Bellevue's mapping program, there are no documented wetlands within any of the projects segments in National Wetlands Inventory or Sensitive Areas Notebook.

FLOOD ZONE HAZARDS

- According to the City of Bellevue's mapping program, there are not documented flood zones within any of the project segments.

GEOLOGIC HAZARD AREAS

- According to the City of Bellevue's mapping program, the Geologic hazard rating for all segments of the trail are rated as "low" except for the first 150 foot of segment, which has a low to moderate hazard rating.

AGENCY PERMITTING REQUIREMENTS

Because of the size, scope and location in WSDOT and City Right of Way, projects that come out of this study will need to comply with both the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA). It is anticipated that the projects will qualify for a Programmatic Categorical Exclusion under NEPA and will results in a Determination of Non-Significance under SEPA. Table 1 lists permits which will likely be needed on some or all segments of the trail.

TABLE 1 Agnecy permitting requirements.

PERMIT	PERMITTING AGENCY	REQUIRED
Right of Way Use	City of Bellevue	Yes – All Segments
Clear and Grade with SEPA	City of Bellevue	Yes – All Segments
Critical Areas Land Use Exemption	City of Bellevue	Possibily required in Segments 3 and 4 only
NEPA	Washington State Dept. of Transportation	Yes – All Segments
WSDOT Construction Permit	Washington State Dept. of Transportation	Yes – All Segments
WSDOT Utility Permit	Washington State Dept. of Transportation	Yes, when utility pipes will be installed in WSDOT ROW, All Segments
Construction Stormwater General NPDES Permit	Washington State Dept. of Ecology	Yes – All Segments
Hydraulic Project Approval (HPA)	Washington Dept. of Fish and Wildlife	Yes, in Segment 4 only with bridge work in waterways
Joint Aquatic Resources Permit (JARPA)	US Army Corps of Engineers	Yes, in Segment 4 only with bridge work in waterways

07
COST ESTIMATES

COST ESTIMATES

COST ESTIMATES

Detailed planning level estimates were prepared for each of the seven segments (see Table 2). Major elements considered in the detailed planning level estimates include the following: Design, Right of Way, Clearing and Grubbing, Removal of Structures and Obstructions, Excavation, Gravel Backfill, Grinding and Overlay, Asphalt, Structural Earth Walls, Soldier Pile Walls, Drainage, Detention, Natural Drainage Practices, Landscaping, Irrigation, Property Restoration, Lighting, Traffic Signal Modifications, and other items. The unit cost for each of the items is based on 2012 dollars and bid information on projects of similar size and scope. A detailed breakdown of each estimate for each segment is shown in Appendix B on page A-25 of the Appendices to this report.

FINANCING PLAN

The Mountains to Sound Greenway Trust is actively working with the City to obtain grants to fund construction of the trail. In November 2011, the City provided a letter of support for the Greenway Trust to obtain 18 million dollars in recreation funding from the State of Washington. If the Greenway Trust receives the funding, Segments 1 and 7 would be fully funded through design and construction.

TABLE 2 Cost estimates.

	SEGMENT	PLANNING LEVEL COST ESTIMATE	FOOTAGE OF TRAIL IN SEGMENT	COST PER FT OF TRAIL
1	Greenway Trail - Factoria Blvd to 142nd Pl SE	$4,711,690	4,750	$992
2	Greenway Trail - 142nd Pl SE to 150th Ave SE	$3,983,638	2,600	$1,532
3	Greenway Trail - 150th Ave SE to 161st Ave SE	$2,857,939	4,300	$665
4	Greenway Trail - 161st Ave SE to SE Newport Way	$3,381,518	4,350	$777
5	Greenway Trail - SE SE Newport Way to Lakemont Blvd SE	$3,081,805	4,020	$767
6	150th Ave SE Vicinity Flyover Bridges	$6,739,024	1,200	$5,616
7	Factoria Blvd SE Vicinity Flyover Bridges	$3,072,723	1,500	$2,048
	Grand Total	**$27,828,337**	**22,720**	**$1,225**

As part of the City of Bellevue 2013-2019 Capital Investment Program, the City has funded the 60% design of the Trail. The total funds allocated are $430,000 for 2013-2014. The exact areas of the trail to be designed to the 60% will be identified in early 2013.

The City of Bellevue and the Mountains to Sound Greenway Trust will continue to work to together to pursue other grant and funding opportunities as they arise.

CITY OF BELLEVUE
TRANSPORTATION DEPARTMENT

MOUNTAINS TO SOUND GREENWAY TRAIL STUDY
DECEMBER 2012

WSDOT

King County

MOUNTAINS TO SOUND GREENWAY

JESSICASTEIN